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THE OXFORD HANDBOOK OF

CHINESE
LINGUISTICS

Edited by

WILLIAM S-Y. WANG

and

CHAOFEN SUN

Assisted by

YACHING TSAI

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THE OXFORD HANDBOOK OF
CHINESE
LINGUISTICS

PART 1

HISTORY

.....

INTRODUCTION

.....

WILLIAM S-Y. WANG AND CHAOFEN SUN

The term *Chinese linguistics* in the title of this handbook refers to research done on the languages of China, regardless of by whom or where the research was carried out.¹ In this introduction, we first give a very brief history of this tradition of research, starting from ancient times, as well as a critique of this tradition. Then we give an overview of the fifty-five chapters that follow, as these are organized according to the eight parts of the volume.

0.1 HISTORY OF CHINESE LINGUISTICS

.....

Chinese linguistics has a long and honored tradition, starting with philosophical discussions on the nature of names by the great philosopher Kongzi 孔子 (Confucius 551-479 BCE). In a famous passage from his *Lunyu* 论语 *The Analects*, Confucius stressed the great importance of calling everything by their correct names, an issue known as *zhengming* 正名 'rectification of names'. He noted that a wrong word can set off a far reaching chain reaction:

"When names are not correct, what is said will not sound reasonable; when what is said does not sound reasonable, affairs will not culminate in success; when affairs do not culminate in success, rites and music will not flourish; when rites and music do not flourish, punishments will not be exactly right; when punishments are not exactly right, the common people will not know where to put hand and foot."

Reading him across a span of 2,500 years, it may not be clear to us how Chinese culture operated during his time. But there can be no doubt that language figured prominently in that ancient world; its abuse leads to major disastrous consequences, according to Kongzi.

Two centuries later, another eminent philosopher in the Confucian tradition discussed the issue of *zhengming* more fully. The following words of Xunzi (b.312) have often been taken to mark the beginning of Chinese linguistics:

“名无固宜，约之以命，约定俗成谓之宜，异于约则谓之不宜。”

“Words have no intrinsic correctness. The correctness is established by convention. When the convention is established and the custom formed, the words are then correct. If they are different from convention, they are then incorrect.”

The central idea behind Xunzi's words is the arbitrariness of the word (and grammar), that there is no systematic relationship between how the word sounds and what it means. The core of the idea is the phrase 约定俗成, which is here translated as “established by convention.” It is remarkable that around the same time in ancient Greece, Plato was making the same point in his *Cratylus*. See Wang (1989) and Yu (2009) for more discussion.

Several empirical investigations in Chinese linguistics followed the philosophical discussions on the nature of language in the Confucian tradition, each a landmark in its own way in ancient China. The list of words compiled by Yang Xiong 扬雄 (53 BCE–19 CE) was perhaps the first study in linguistic geography in the world. In contrast with philosophical musings earlier, Yang's work marks the beginning of empirical studies of language in China.

The full name of the work is somewhat bulky: *Youxuan Shizhe Juedaiyu Shi Bieguo Fangyan* 輶轩使者绝代语释别国方言, so it is typically abbreviated as *Fangyan* 方言. Although the word *fangyan* now means ‘dialect’ in Modern Chinese, the compiled list actually contains numerous words from non-Sinitic languages in north and central China, used before the Common Era.

Another landmark in the early development of Chinese linguistics is the dictionary compiled around 100 CE by Xu Shen 许慎, called the *Shuowen Jiezi* 说文解字. There was an earlier dictionary of more limited scope, called the *Er Ya* 尔雅, but the *Shuowen* has exerted by far the greater influence. In addition to the over 9,000 Chinese characters² it describes, the *Shuowen* offered a conceptual scheme whereby the characters were classified into six types. Basic to this scheme is the idea of the *bushou* 部首 ‘radical’, which is either a complete character itself or part of some other character; the *bushou* suggests a rough semantic category to which each character belongs, such as ‘water’, ‘wood’, ‘animal’, ‘heart’, and so on. In a way, the system of *bushou* can be seen as a miniature representation of the world in semantic categories. The *Shuowen* had a system of 540 *bushou*; many modern dictionaries have 214 *bushou*; the 11th edition of the popular *Xin Hua Zidian* ‘New China Dictionary’ published in 2011 now has 201 *bushou*.

Xu Shen's six categories, called *liushu* 六书, are still frequently referred to today: (1) *xiangxing* 象形 ‘pictograms’, (2) *zhishi* 指事 ‘simple ideograms’, (3) *huiyi* 会意 ‘complex ideograms’, (4) *xingsheng* 形声 ‘phonograms’, (5) *zhuanzhu* 转注 ‘derivatives’, and (6) *jiatje* 假借 ‘phonetic loans’, which he exemplified by these six pairs of

characters: (1) 日, 月; (2) 上, 下; (3) 武, 信; (4) 江, 河; (5) 老, 考; (6) 令, 长. Category (1), exemplified by ‘sun’ and ‘moon’, consists of ‘pictograms’; earlier forms of these two characters have a stronger resemblance to their referents. Category (2), exemplified by ‘up’ and ‘down’, consists of characters that express their meaning by pointing; here the first exemplar points up and the second exemplar points down. The characters in category (3) are made up of two semantic components; the first exemplar consists of components that mean ‘stop’ 止 and ‘weapon’ 戈 and now means ‘martial’; the second exemplar consists of components that mean ‘man’ 人 and ‘language’ 言 and now means ‘trust’. Categories (5) and (6) have very few characters each; Xu's logic behind these two categories is more obscure.

Category (4) consists of ‘phonograms’ and has by far the most numerous characters among the six categories. Xu exemplified this category by two words, both meaning ‘river’: 河 is used more in northern China, as in its major river, *Huanghe* 黄河 ‘The Yellow River’; 江 is used more in southern China, as in its major river, *Changjiang* 长江 ‘The Long River, i.e. The Yangtze’. In these two exemplars, the *bushou* on the left of the character, also called its semantic, suggests the meaning of ‘water’, and the component on the right of the character, also called its phonetic, suggests a pronunciation by means of a homophonous or near-homophonous character.

Phonograms have always been the most numerous among the six categories of characters in the history of Chinese writing; some 80% of the entries in *Shuowen Jiezi* belong to this category. Although they differ from alphabetic spelling in fundamental ways, they do contain phonetic information. However, the information contained in the phonetic component is often not an accurate pronunciation of the host character now for various reasons, even if it did so at some earlier time. Thus in the examples in (4), 江 is now pronounced *jiang* whereas its phonetic 工 is *gong*; the *j*-initial consonant is derived from the *g*- by a prevalent sound change called ‘palatalization’. Similarly 河 is *he* whereas its phonetic 可 is *ke*.

In ancient times, the pronunciation of a character was provided by another character in dictionaries. Indicating the pronunciation of one character by another, that is $X = Y$, often caused difficulties when the reader did not know the pronunciation of either X or Y . An important step forward in decomposing the syllable was taken early in the Common Era with the invention of a method of notation called *fangqie* 反切, presumably under the influence of Sanskrit writing, which came in when China adopted Buddhism. According to *fangqie*, the syllable that represents the unknown character is decomposed into two parts A and B , where A is the initial consonant of the syllable and B consists of the final and the tone of the syllable, even though the concept of tone would not become explicitly recognized until later.

The *fangqie* method may be represented by the formula $X = A + B$. An illustration in English of this method would be, assuming we do not know the pronunciation of ‘song’: song = so + long. Similarly, the *fangqie* for the character 东 *dong* may be notated phonetically as 东 *dong* = 德 *de* + 红 *hong*, where 德 indicates the initial consonant of 东, and 红 indicates its final and its tone.

Another important step in decomposing the syllable was taken by the time of Shen Yue 沈约 (441–513 CE), who discovered that there were four lexical tones in the official

language, which were named *ping* 平, *shang* 上, *qu* 去, and *ru* 入. In the famous rhyme dictionary *Qieyun* 切韵, compiled in 601 CE, the pronunciation of each character could be determined by the tone it had and by its *fanqie* notation. The *Qieyun* has played a pivotal role in helping us understand the phonological history of the Chinese language.

The phonological system reconstructed from the data it contains is called *Zhonggu Hanyu* 中古汉语 or Middle Chinese. Since many scholars participated in the compilation, as recorded in the preface of the *Qieyun*, so in all likelihood the system it reflects incorporated pronunciation features from several major dialects of that time. This system has been projected backward to the time of *Shijing* 诗经 at around 1,000 BCE; the fact that almost all of the poems in the *Shijing* rhyme is of course extremely helpful in this undertaking. The phonological system thus reconstructed is called *Shanggu Hanyu* 上古汉语 or Old Chinese. Similarly, Middle Chinese has also been projected forward via later rhyme dictionaries, up to the dialects of today.

Unfortunately, no intact copy of the *Qieyun* has survived to this day, even though it was officially recognized for imperial examinations in early dynasties. However, the tradition of rhyme dictionaries was passed on. Among the more influential are the *Daxing Chongxiu Guangyun* 大宋重修广韵, or *Guangyun* 广韵 for short, compiled in 1008, and the *Zhongyuan Yinyun* 中原音韵 compiled in 1324. Each of these rhyme dictionaries is a treasure house of information regarding the language of the time of its compilation.

The Chinese language did not exist in a vacuum. From the very beginning and throughout the millennia, it influenced surrounding languages by exporting words to them, especially as they adopted the Chinese writing system. Reciprocally, the Chinese language was influenced by them as well by importing words from them. With the coming of Buddhism, for instance, many words came into Chinese from Sanskrit. Similarly, numerous words came into the Chinese language from Altaic languages in north China and from Austric languages in south China. Exported words have been extensively studied as these took on different forms in their new settings, especially Sino-Japanese, Sino-Korean, and Sino-Vietnamese; collectively these words have been called Sino-Xenic, referring to their multiple origins. All these words, whenever they migrated and in whatever direction, are useful for the reconstruction of the languages and cultures of past centuries in East Asia and Southeast Asia.

Alongside the rhyme dictionaries, another tradition arose in the Song 宋 Dynasty (960–1279) that shows a remarkable degree of phonetic knowledge in China a millennium ago. This is the tradition of the rhyme tables, in which the characters are presented in tabular form and the columns are labeled by the phonetic properties of the initial consonants of the syllables. Concepts such as voicing, aspiration, as well as place of articulation can all be clearly seen in these tables. The best known of these rhyme tables is the *Yunjing* 韵镜; the preface to this important work has been translated and discussed by Coblin (2006).

Another measure of the degree of sophistication in phonetic knowledge a millennium ago is a passage by Shen Kuo 沈括 (1031–1095), a remarkable scholar of the Song Dynasty who recorded numerous scientific observations in his *Mengxi Bitan* 梦溪笔谈. The passage, translated by Kong (2007), is the earliest discussion of an artificial larynx, made from bamboo, bone, ivory, and wood, inserted into the throat to produce voice.

Very few documents have played as prominent a role in Chinese civilization as the *Shijing*. Confucius revered it and repeatedly recommended it to others. A recent introduction to this document is Wang (2013). However, the fact that many of its poems no longer rhymed often puzzled later scholars. The answer to this enigma came from Chen Di 陈第 (1540–1620), a scholar-general. In his epoch-making study *Maoshi Guyin Kao* 毛诗古音考, he exhibited the first traces of scientific method in investigating language, considering the nature of the evidence he used for inferring ancient pronunciations. He prefaced his study with these words:

“盖时有古今，地有南北，字有更革，音有转移，亦势所必至。”

“Time, there is past and present. Space, there is south and north.”

“Words change. Pronunciations shift. All are in the nature of things.”

According to Chen, it is only natural, therefore, that poems that rhymed in the Shang 商 (16th century to 1046 BCE) and Zhou 周 (1046 to 771 BCE) Dynasties would no longer rhyme centuries later—since both the written language and the spoken language change in time and in space. This fundamental insight was to become much more fully developed in the study of Indo-European languages some two centuries later.

The paradigm of research Chen Di started blossomed in the works of the philologists of the Qing 清 Dynasty (1616–1911). These scholars followed through on the methods Chen pioneered and arrived at a deeper understanding of Old Chinese phonology than ever before. They not only studied the categories of rhyme, as reflected in the *Shijing*, but also ventured into the ancient system of consonants, bringing in the writing system importantly as additional data.

To give but one example, Qian Daxin 钱大昕 (1728–1804) hypothesized that labiodental consonants, such as [f-] and [v-], had developed out of labial consonants, such as [p] and [b], and that [f-] and [v-] did not exist in Old Chinese; this hypothesis was fully verified in later studies. Their solid achievements have been compared with the scientific revolution in the natural sciences in the West, which took place at approximately the same time; see Hu (1934).

To conclude this very brief survey of the tradition of Chinese linguistics before it started to merge with ideas from the West, beginning in the 20th century, we note some of its limitations. It should be clear from the previous paragraphs that the central goal of much of earlier work was the explication of ancient texts, such as the *Shijing*, what they meant, how they were written, how they were pronounced, and how they rhymed. Since the intent was not to explain the nature of human language per se, perhaps “philology” is a better characterization of their scholarship than “linguistics.”

Given such an orientation, it is not surprising that very little attention was given to the great diversity of languages China has always had, or to the relationships among them. Perhaps it is a consequence of this unfortunate narrowness of vision, or Han-centrism, that the tradition of Chinese linguistics is largely silent on the question of language origins; in contrast there is no dearth of literature on this question among the various ethnic minorities; see Tao and Zhong (1989).

Another neglected opportunity in the earlier tradition is the exclusive concern with sound and script, paying very little attention to grammars at large. The first grammar of the Chinese language was published as late as the end of the 19th century, the *Mashi Wentong* 马氏文通, a futile imitation of Latin grammars.

Western influence on Chinese linguistics came in systematically only in the 20th century. A major figure in this interaction was the prolific Swedish scholar Bernhard Karlgren 高本汉 (1889–1978), who first connected the extensive scholarship of the Qing Dynasty to modern Chinese dialects. Although other European scholars have also made outstanding contributions to Chinese linguistics, most notably August Conrady (1864–1925) of Germany and Henri Maspero (1882–1945) and André-Georges Haudricourt (1911–1996) of France, none has had a greater impact than Karlgren; see Malmqvist (2011).

After fieldwork in China 1910–1912, Karlgren wrote his dissertation in French, *Études sur la phonologie chinoise*, followed later by a long series of papers in English; his last paper was published in 1976, at age eighty-seven. A Chinese translation of Karlgren's monumental work was published in Shanghai in 1940 as *Zhongguo Yinyunxue Yanjiu* 中国音韵学研究 by three Chinese scholars³ who were to lay the foundations for the new Chinese linguistics: they were Chao Yuenren 赵元任 (1892–1982), Luo Changpei 罗常培 (1899–1958), and Li Fang-Kuei 李方桂 (1902–1987).

In 1929, when the Institute of History and Philology was founded in the Academia Sinica, all three scholars were appointed researchers.⁴ The Academia Sinica relocated to Taiwan in 1948, and in 2004 the Linguistics Section of the Institute of History and Philology became an independent Institute of Linguistics within Academia Sinica. In 1950, one year after the establishment of the People's Republic of China, Luo helped found the Institute of Linguistics within the Academy of Social Sciences in Beijing and served as its first director.

Li and Chao, on the other hand, received their doctorates from the University of Chicago (1928) and Harvard University (1918), respectively, and worked primarily in universities in the United States. Li continued to work on reconstructing Old Chinese, improving significantly the foundation Karlgren had laid. Li also pioneered the study of non-Sinitic languages in China and proposed a classification of the languages of China that is widely accepted in China. In addition to these contributions, his comparative work on the Tai languages is a standard in the field; see Mei (2013).

Chao initiated the major surveys of Chinese dialects, starting in the 1920s, making good use of his exceptional skills in phonetics. His *Grammar of Spoken Chinese*, published in 1968, remains a classic in language description to this day. An indication of the esteem it received in the field is the fact it was translated into Chinese by the director of the Institute of Linguistics in Beijing and independently by the director of the Institute of History and Philology in Taiwan. Also in 1968, Chao published his *Language and Symbolic Systems*, especially important because of its multidisciplinary perspective on the nature of language. In addition to language studies, Chao was also an accomplished musician, having composed some of the best-loved songs in the 20th-century China. His prolific output has recently been anthologized and published in a multivolume series in Beijing.

These three scholars, Chao, Li, and Luo, were the bridge that connected traditional Chinese linguistics with international linguistics at large in the early 20th century; for

later developments, see Lee (2000). The connection is firmly established by now, and meaningful cross-fertilization will surely continue to increase.

0.2 OVERVIEW OF HANDBOOK

0.2.1 Part 1: History

Now let us turn to an overview of the *Handbook*; a road map of the fifty-five chapters follows, organized into eight parts. The present chapter serves as an introduction to the entire volume. Chapter 1 presents the peoples and languages of China in a multidisciplinary perspective, incorporating recent findings in archeology and genetics. Such background information is necessary for appreciating Chinese linguistics in a global context.

In chapter 2, Zev Handel gives a current view on how Chinese is classified with respect to other languages of East and Southeast Asia.

Regardless of which languages are the more distant relatives of Chinese, there is general consensus that its closest relatives are Tibeto-Burman languages. For many decades now, especially since the influential classification offered by Li Fang-Kuei in 1937 (reprinted in 1973 in the first issue of the *Journal of Chinese Linguistics*), linguists have mostly used the label “Sino-Tibetan” to refer to the parent language of about 6,000 years ago. In chapter 3, Randy LaPolla discusses the difficult topic of Sino-Tibetan syntax. In chapter 4, Mei Tsulin 梅祖麟 presents the processes of word formation in Sino-Tibetan, tracing some of these processes all the way down to modern dialects.

As discussed in the first part of this introduction, historical phonology has always occupied center stage in traditional Chinese linguistics. Against this time-honored background, Zev Handel presents in chapter 5 the current view on what Old Chinese and the *Shijing* may have sounded like some 3,000 years ago. Similarly, Pan Wuyun 潘悟云 and Zhang Hongming 张洪明 present in chapter 6 what Middle Chinese and the *Qieyun* may have sounded like 1,500 years ago.

In contrast to earlier chapters, which summarize results from the field, chapter 7 by Shen Zhongwei 沈钟伟 gives results only recently achieved by the author himself. By making innovative use of ancient Altaic inscriptions, he is able to date Early Mandarin considerably earlier than the dates that have long been assumed in the field. In a collection ranging over as large a territory as this *Handbook*, there are bound to be gaps in coverage. We hope future works of this genre will have chapters that can go into depth on the Altaic languages in China.

0.2.2 Part 2: Languages and Dialects

Parts 2 and 3 are devoted to placing the Chinese language within a larger historical perspective. *Chinese language* and related terms like *Standard Chinese*, *Modern Chinese*, *Mandarin*, *Guoyu*, and *Putonghua* all refer to the language based largely on Beijing

speech, which has been the political center of China for some eight centuries. The seven chapters in Part 2 deal mostly with the diversity of languages and dialects of China, grouped according to genetic units at various levels. The Austric phylum, discussed by Chen Baoya 陈保亚 and Li Zihé 李子鹤 in chapter 8, includes Kam-Tai, Austro-Asiatic, and Austronesian. Of these, the genetic affiliation of Kam-Tai is the most controversial because of its similarities with Sinitic; this question has been long debated in the literature among specialists and remains controversial today. Although a few Austro-Asiatic languages are spoken in China, most members of this family are distributed over peninsular Southeast Asia.

The Austronesian languages are presented in chapter 9 by Li Jen-kuei 李壬癸, exemplified with two members from this family: Bannan and Atayal. Although Austronesian languages distribute over great distances on the globe, the ones found in Taiwan are distinct in two important ways: they are the most diverse, and they retain the most archaic features. For these reasons, as Li states, we believe that the original speakers settled in Taiwan a long while before their descendants took to the sea, populating places as far as New Zealand, Easter Island, and Madagascar. This view of Taiwan as homeland may differ, however, from the reconstruction based on molecular genetics; see HUGO (2009:332).

As stated earlier, there is general consensus that Chinese is related to Tibeto-Burman languages; the question is how they are related. The current term *Sino-Tibetan* suggests that Chinese was the first to diverge from all the Tibeto-Burman languages, perhaps 6,000 years ago. As noted in chapter 2, such a suggestion may have been unduly influenced by the current dominant position that the Chinese language holds. In chapter 10, George van Driem presents a historical analysis of research in this area, going back to European scholarship in the early 1800s. By reference to geographical distribution, as well to Trans-Himalayan languages difficult to access, van Driem presents a compelling case for a new look at this language family.

The remaining four chapters in this section all deal with the dialects of Chinese. Here we also have a small problem with terms. *Chinese dialects* is traditionally used to refer to varieties of language as different from each other as the Germanic languages or the Romance languages of Europe. So from the viewpoint of time depth of separation and the low degree of mutual intelligibility, they may be more rightly called *Sinitic languages*, as many scholars prefer to do. In defense of the traditional term, however, one can point to the sociopolitical unity of the speakers as well as the powerful unifying force of a shared writing system that reaches back over 3,000 years.

In chapter 11, Ho Dah-an 何大安 presents an overview of the current situation, though he reminds us that “their interrelationships remain uncertain because new data are constantly emerging.” Indeed, his cautionary note has a broader applicability beyond Chinese, since dozens of minority languages have been discovered as well in recent decades. Of the ten major dialects Ho lists, Mandarin is discussed repeatedly in this *Handbook*, since it is the only dialect that has national status. In addition, three other dialects are presented in full chapters: Min by Lien Chinfa 连金发 (chapter 12), Yue by Anne O. Yue 余霭芹 (chapter 13), and Wu by Zhengzhang Shangfang 郑张尚芳 and Zheng Wei (郑伟) (chapter 14).

These three dialects, spoken along China’s south coast, were largely formed during the early centuries of the Common Era. They have special importance because of their large number of speakers as well as their wide geographical distribution. Each group is distinct in a variety of ways. In phonology, for instance, the Min has retained many Middle Chinese bilabial words (e.g., 飯 *pŋŋ* ‘cooked rice’) with a syllabic nasal whereas these have changed into labiodentals in Putonghua (e.g., *fan*). In Wu, on the other hand, voicing in Middle Chinese obstruents has been preserved, so the same word is pronounced *we* in Shanghainese where the final nasal consonant has been lost.

As the authors of these three chapters make clear, there is actually considerable diversity within each of these dialect groups. Mutual intelligibility is minimal between the Yue spoken in Hong Kong and that in Taishan, even though the two cities are geographically quite close. Similarly, the Wu spoken in Shanghai is quite different from that in Wenzhou, and someone from Fuzhou who speaks Northern Min is barely intelligible to a Southern Min speaker in Taiwan.

0.2.3 Part 3: Language Contact

Whereas the two preceding sections discuss language from the viewpoint of vertical transmission, which is the basis of genetic relationships, the five chapters of Part 3 deal with horizontal transmission, the adoption (or borrowing) of linguistic features when languages come into contact. In chapter 15, Cao Guangshun 曹广顺 and Yu Hsiao-jung 遇笑容 highlight three periods in Chinese history during which language contact were extensive: (1) Late Han Dynasty (c.200 CE) to Tang/唐 Dynasty (618–907) due to Buddhism, (2) Yuan 元 Dynasty (1279–1368) due to the Mongols, and (3) Qing Dynasty due to the Manchus. Whereas influence on Chinese came from Indic languages to the southwest in (1), it came from Altaic languages to the northeast in (2) and (3). Their chapter reviews some of the interesting effects these contacts have had in the development of Chinese syntax.

The next two chapters deal with the influence the Chinese language has exerted on its neighbors, primarily in the form of words assimilated into the host languages. In chapter 16, Endo Mitsuaki 远藤光晓 divides Sino-Japanese words into six chronological layers. The earliest of these is the Suiko period (592–628), which corresponds to the reign of the first empress, followed by Go-on and Kan-on, and others. An interesting sidelight in this development is the large increase of Sino-Japanese words around the Meiji era (1868–1912), showing perhaps the greater readiness of Japanese culture to assimilate foreign elements.

Sino-Korean, as recounted by Eom Ik-sang 严翼相 in chapter 17, dates back much earlier than Sino-Japanese, by some eight centuries, namely 194 BCE, when a general defected from the Han Dynasty, crossed over the Yalu River, and established a short-lived kingdom there, known as Wiman Choson. Eom compares the various layers of Sino-Korean with their original sources, from Old Chinese, to Middle Chinese, down to Modern Chinese. Traffic in language contact often goes both ways. Chapter 17 ends

with an interesting list of words now used widely in Chinese that may have originated in Korean, an indication of the rising popularity of Korean culture in the world.

Another neighboring language that contains numerous Chinese words in its lexicon is Vietnamese. As mentioned earlier in this introduction, the term *Sino-Xenic* is used to refer collectively to Sino-Japanese, Sino-Korean, and Sino-Vietnamese, each a valuable resource for shedding light on the linguistic history of East Asia. Although the words were originally assimilated into these languages as companions of their written forms, when these neighboring countries had not gained literacy, Korean and Vietnamese are no longer written with Chinese characters. This makes the explorations of their histories a little less transparent but no less worthwhile.

In chapter 18, Shi Xiangdong 施向奈 makes it clear that the influence of Buddhist Sanskrit on the Chinese language has been considerable. Many words have crossed the line from religious discourse to everyday use, such as *shijie* 世界 'world' and *boli* 玻璃 'glass'. These words are among the numerous words in the sutras that were transliterated rather than translated, according to the principles set forth by *Xuanzang* 玄奘, fictionalized as the famous monk *Tangseng* 唐僧 in the classic novel *Xiyouji* 西游记 'Journal to the West'. More than just words and grammatical patterns, Buddhist Sanskrit contributed early to the methods for analyzing the Chinese language, in the form of *fanqie* spelling and in the invention of rime tables, as discussed earlier in this introduction.

Chapter 19 by Wang Feng 汪锋, the last in this section, takes us back to the problem of Sino-Tibetan classification, alluded to earlier. Wang discusses the Sino-Bodic hypothesis advanced by George van Driem, also discussed in chapter 10, which offers an alternative view on the relationships among these several hundred languages. The chapter ends with a report of a particularly controversial case, the genetic affiliation of the Bai language. Based on his own extensive investigations and fieldwork, Wang concludes that Bai is most closely related to Chinese, rather than to another family of Tibeto-Burman languages, Yi, as has been supposed earlier. The Bai case is an example of the large amount of in-depth investigations that will need to be done before these several hundred languages can be securely subgrouped, and eventually given an appropriate name.

0.2.4 Part 4: Morphology

Parts 4, 5, and 6 cover what may be called the core material of Chinese linguistics, the structure of Putonghua, or Standard Chinese. Parts 4 and 5 deal with various aspects of its grammar (morphology and syntax), while Part 6 deals with its sounds (phonetics and phonology). The orientation of the eighteen chapters contained in these three sections is strongly empirical in the sense that they are concerned with the facts of the language rather than using these facts to argue for one formal theory or another. Such an orientation is by far the most appropriate for the nature of the present *Handbook*, which is aimed at a broad audience of readers from a wide variety of backgrounds.

In chapter 20, Jerome Packard presents a succinct and well-illustrated account of how four types of morphemes combine to form four types of complex words, which include

compounds, bound root words, derived words, and inflected words. Here the reader will see that Chinese is significantly simpler than the common European languages in its morphology. Liu Meichun 刘美君 (chapter 21) introduces how events are conceived and reported in Chinese discourse through perfective, progressive, durative, and other aspect markers without a grammaticalized category of tense.

Huang Chu-Ren 黄居仁 and Hsieh Shu-Kai 谢舒凯 (chapter 22) present an interesting case relating the radical component of a Chinese character to the event structure of verbal semantics they signal. From the following two chapters, the reader can see what the composite event structures of the Chinese resultative verb compounds can look like (Iham Shiao Wei 谭晓薇: chapter 23) and an implicational hierarchy of the verbal morphemes in motion-events in terms of scalar specificity (Lin Jingxia 林静夏: chapter 24).

The authors of the last three chapters of Part 4 deal with some fundamental, yet not very well understood, issues in Chinese language study. Through the data collected from spoken language based on corpora, Tao Hongyin 陶红印, in chapter 25, demonstrates most convincingly, among other things, the commonly held belief that Chinese vocabulary is highly problematic. That is, Chinese is no longer a monosyllabic language as it once might be in the past on the basis of the Chinese words, or *lexi*-types, in published dictionaries, in which monosyllabic words make up only 13% of the Modern Chinese vocabularies. However, from the data collected by the author from authentic spoken language, among the top 1,000 most frequently used words, 72.2% are monosyllabic, and among the top 100, 82.3% are monosyllabic. It then follows that Chinese may be still far from being a simple multisyllabic language.

Chapter 26 by Huang Chu-Ren and Xue Nianwen 薛念文 discusses the robust results of using an automated Chinese word-segmentation model to parse Chinese texts without a word list. It is shown that, if strict modularity is followed, successful parsing is possible by only recognizing specific types of intervals associated with different characters without having to identify Chinese words, as Chinese orthography does not conventionalize word boundaries and the characters correspond more closely to meaning-bearing morphemes, minimal units of meaning, than words. Pertaining to the unclear word boundaries of the language, chapter 27 by Sun Chaofen 孙朝奋 shows that Chinese nouns are not formed uniformly. Depending on the extents that a modifier coalesces into its nominal head to form a word, there are probably nouns of different degrees of independence, such as simple words, word-like nouns, and phrase-like nouns. They can be systematically distinguished from their abilities in co-occurring with the nominal modification marker *de* 的. Whereas the use of *de* is strictly prohibited for a fully lexicalized noun (proper nouns and simple words), the word-like nouns and phrase-like nouns interact with the phrasal marker *de* depending on their degrees of lexicalization, thus explaining the use, or non-use, of the phrasal marker *de* in all cases between a noun and its modifier(s).

0.2.5 Part 5: Syntax

The five chapters in Part 5 deal with some of the syntax/semantics interface issues in Chinese language. Wu Fuxiang 吴福祥 and He Yancheng 何彦诚 (chapter 28) provide

an overview of the Chinese syntax in comparison to the typological features in the light of the languages of the world. Xu Liejiong 徐烈炯, in chapter 29, presents an interesting account of the Chinese word order as a topic prominence, or discourse configurational, language. Unlike the English-style topic structure, the Chinese-style topic structure, or double nominative constructions, in which the topic cannot be analyzed as movement from any structural position in a sentence, is explained through a topic licensing condition. Chen Ping 陈平, in chapter 30, further elaborates on the importance of discourse in relation to the structure of Chinese. Chinese is found to be sensitive to discourse thematic referentiality. That is, bare noun phrases are the favored grammatical form in encoding pragmatic and thematic nonreferentials and referents of low thematic referentiality. The pragmatic distinction between identifiability and nonidentifiability is expressed in Chinese in terms of distinctive lexical and morphological encodings and the positioning of nominal expressions in sentences. Furthermore, definiteness and indefiniteness have simply not been fully developed as a grammatical category in Chinese.

Big Yung-O 毕永娥 (chapter 31) gives a comprehensive description of the word order of Chinese adverbs, including degree, negation, scope, affective, epistemic, and special adverbs like *cai* 'only', *jiu* 'just', *you* 'again', *ye* 'also', *dou* 'all' adverbs and notes that their positions in a sentence cannot be fully accounted for simply in terms of clause, or predicate, orientation. Sun Chaofen in chapter 32 portrays the historical developments of the Chinese *BA* construction as a case of specialization resulting from multiple changes in the language. It has not only inherited the structure of a Middle Chinese three-argument monoclausal but has also grammaticalized into a specialized change-of-state construction focusing on the resultant state of an event after it had acquired the cause-and-effect semantics in Early Modern Chinese from the purposive construction marked by *lai/qiu*.

0.2.6 Part 6: Phonetics and Phonology

Part 6 includes six chapters on phonetics and phonology. Kong Jiangping 孔江平 (chapter 33) gives an outline of phonetic studies on phonation types in the languages of China. Chapter 34 by Shi Feng 石锋, Peng Gang 彭刚, and Liu Yi 刘艺 reports surveys on the formant frequencies of vowels in both isolated syllables and continuous speech of two major Chinese dialects, Hong Kong Cantonese and Putonghua. Chapter 35 by Wee Lian Hee 黄良喜 and Li Mingxing 李明兴 offers a synchronic view through three cascading windows in modern Chinese phonology: syllable structure, allophony, and tone. Chapter 36 by Xu Yi 许毅 demonstrates that an adequate understanding of intonation is achievable only if two complementary aspects of speech are fully taken into account, that is, the articulatory mechanisms and communicative functions. The intonational components are introduced in terms of their functions with communicative meanings such as focus, sentence modality, topic turn taking, and boundary marking in the form of declination, downstep, and rhythm. Chapter 37 by Zhu Xiaonong 朱晓农 and Wang Caiyu 王彩豫 brings together a general profile of Chinese tones and recent efforts in

exploring the fundamentals of tone sandhi and tonogenesis and the theoretical characterization of these fundamentals. Chapter 38 by Peng Gang and Zhang Caicai 张恺恺 discusses the issues in the perception of tones, a particularly important topic in Chinese linguistics.

0.2.7 Part 7: Sociocultural Aspects

Part 7 includes nine chapters on the sociocultural aspects of the Chinese languages. Chen Ping in chapter 39 gives a lucid account of the major underlying motivations, proposals, official policies and measures, as well as the outcomes in the Chinese language reform movements over more than a century toward these goals. The reader will see the developments since the final years of the 19th century leading up to the adoption of national standards in both writing and pronunciation on the basis of some variety of contemporaneous Northern Mandarin in a country marked by pronounced linguistic diversity. On the other hand, Sun Hongkai 孙宏开 in chapter 40 directly deals with the government policy on minority languages since the 1950s. The chapter also provides an overall assessment of the measures taken by the government through its successes and problems over the past sixty years. Chapter 41 by Wang Feng and Tsai Yaching 蔡雅菁 is a general review of the historical developments of the Chinese script, its cognitive basis as well as the standardization of the characters over the past two millennia.

Richard Chi 齐德立 in chapter 42 gives an insightful summary, with sample instructional strategies and activities, of the conceptual orientations for Chinese curriculum design and teaching methodology commonly adopted in the world language education since the 1980s in the United States. Agnes He 何维芸 in chapter 43 delineates the sociolinguistic characteristics of Chinese as a heritage language, providing an overview of how the Chinese language is inherited, acquired, maintained, or even lost as an immigrant language. David Li 李楚成 in chapter 44 describes the tensions between the national standard *Putonghua*, or *Guoyu* in Taiwan, and various regional dialects in China, as well as its emergence as a domestic and international lingua franca in Greater China. Drawing on the research based on the analysis of 450 million characters of Chinese newspaper texts from several representative major Chinese speech communities, Benjamin Tsou 邹嘉彦 and Kwong Oi Yee 刁蕊儿 in chapter 45 discuss how variations in using Chinese characters and words reflect the cultural and social traits characteristic of differences in time and space, probably as a phenomenon analogous to those of the English languages across the Atlantic, or between varieties of Indian, or Singaporean English and British English. On the basis of the language commonly used in overseas Chinese communities, Li Wei 李巍 in chapter 46 reviews the current theories and models of the sociolinguistic phenomenon of codeswitching and interestingly finds evidence to say that Chinese speakers are natural multilinguals who codeswitch routinely. Xu Daming 徐大明 in chapter 47 gives a most intriguing description of how, over the time span of fifteen years or so, the *Kindulun* migrant community in Baotou has socially constructed itself through the selections of gender-indexing speech conventions within the community.

0.2.8 Part 8: Neuropsychological Aspects

Part 8 consists of eight chapters involving various topics in neuropsychological aspects of the Chinese languages. Chapter 48 by Twila Tardif summarizes what recent research has revealed about the early vocabulary of the Chinese-speaking children. Studies have found that, unlike children of the European languages, children speaking Mandarin, Cantonese, and even Korean learn, from the early stages, the nouns and verbs together that are highly imageable, or specific in meaning. Chapter 49 by Helena Gao 高虹 reports a corpus-based study of the production of physical action verbs by ten Chinese-speaking children (about two years old), showing how nonlinguistic factors involving body parts affect children's understanding of the effects and intentions implicated by some physical action verbs.

Chapter 50 by Kathleen Ahrens describes with Chinese data the cross-linguistic support to models of lexical representation and access, lexical ambiguity resolution, and conceptual metaphor processing. Chapter 51 by Li Ping 李平 demonstrates interesting research findings by utilizing computational and neuroimaging tools about the different cognitive processes between Chinese and English language acquisitions. In relation to the unalike patterns in learning nouns and verbs between Chinese and European children noted in Tardif's and Gao's chapters, this chapter offers a piece of cognitive explanation; that is, because of the dissimilar input characteristics of these languages, learners use different parts of their brains in processing words. Chapter 52 by Catherine McBride, Tong Xinhong 佟秀红, and Mo Jianhong 莫剑宏 also find from their study on developmental dyslexia in Chinese that, although all writing systems rely on a conversion from phonological to morphological or orthographic representations for reading acquisition, the strength of the semantic and orthographic representations are stronger and the phonological representations are weaker in Chinese relative to other scripts.

Chapter 53 by Zhu Hua 祝华 begins with an overview of the causal and risk factors underlying developmental speech and language disorders and discusses five types of disorders in the Chinese context with empirical evidence. Chapter 54 by Gladys Tang 邓慧兰 offers an interesting introduction of the linguistic properties of the Hong Kong Sign Language so that readers will see how the linguistic units of the Hong Kong Sign Language sequentially and simultaneously interact with each other as a grammatical system independent of Cantonese, the most commonly used spoken language in Hong Kong. On the other hand, chapter 55 by James Tai 戴浩一 and Jane Tsay 蔡素娟 is a structural analysis of Taiwan Sign Language focusing on the inventory of its basic signs in terms of phonology, morphology, and syntax and how they have developed historically in relation to the Japanese and other Chinese Sign Languages.

In concluding this introductory chapter, we must express our heartfelt appreciation to the many authors that follow, who have generously shared their knowledge with all our readers. We would also like to thank Professor and Mrs. Ting Panghsin 丁荆新 for allowing us to use their combined artwork on the cover of this *Handbook*. The poem on early plum blossoms 早梅诗 was composed by Lan Mao 兰茂 1400; it ingeniously represents each of the twenty Early Mandarin initial consonants in a separate sinogram

of the poem. Professor Ting's elegant calligraphy is nicely complemented by Mrs. Ting 陈琪's graceful painting. Lastly, this volume was initiated by Brian Hurley, who was then at the Oxford University Press. The project was continued by Hallie Stebbins, Augustine Leo and David Joseph at OUP, who helped us carry it to fruition with effectiveness and professionalism. Throughout the project we have had the dedicated assistance of Tsai Yaching, who not only helped us edit the various chapters in collaboration with their authors, but also prepared the valuable index at the end of the volume. To all of them, we offer our heartfelt thanks.

Chinese linguistics is a broad and dynamic field that is moving forward very rapidly. Our ardent hope is that this *Handbook* will provide a foundation for it to continue its growth in a balanced perspective.

NOTES

1. The term *Chinese linguistics* is ambiguous. In addition to the definition used here, it can also mean linguistic research done in China on any language or theme, or linguistic research done by people who are ethnically Chinese, wherever they may be.
2. The term *Chinese character* has become largely established in English for referring to the unit in Chinese writing, though it is unwieldy and uninformative. Other nouns, such as *ideograph*, *pictograph*, *logograph*, or adjectives, such as *morphosyllabic* and *logosyllabic*, are also used. The most straightforward designation for this unit of Chinese writing would be an English translation of *hanzi* 汉字, which would be 'sinogram'; this corresponds to usage in Japanese *kanji* 漢字, and in Korean *hanja* 韓字; see Wang and Tsai (2011). In this *Handbook*, however, we follow established usage in the interest of consistency across chapters.
3. In Hanyu Pinyin, the names would be spelled Zhao Yuanren and Li Fanggui.
4. Mei (2013) gives a capsule history of the linguists during the formative period of the Institute of History and Philology.

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CHAPTER 1

THE PEOPLES AND
LANGUAGES OF CHINA*Evolutionary Background*

WILLIAM S-Y. WANG

Some 50 million years ago, the continental plate on which India is now situated drifted northward and collided with the much larger continental plate we now call Eurasia. This collision forced an upward projection of the landmass, resulting in a mighty range of mountains, the Himalayas, a word of Sanskrit origin with a stem meaning of "snow". The tallest peak in the range was marked in the maps compiled during the long reign of Emperor Kangxi (1661-1722) as Zhumulangmafeng 珠穆朗玛峰, based on the Tibetan word, Qomolangma,¹ which may be translated as "Goddess-Mother." The peak is almost 9,000 meters above sea level and continues to rise.

The physical stage on which the peoples and languages of China play out their destinies was thus set in major outline a long time ago. It is marked by an ultra dry western part of high plateaus, since the moist air currents from the oceans down south is blocked by tall mountains. At the same time, the land has a pronounced west-east tilt, and the two great rivers that originate from these mountains, the Huanghe 黄河 'Yellow River' and the Changjiang 长江² 'Long River,' flow eastward to the Pacific, nourishing the land in between.

The Last Glacial Maximum peaked during 25,000 and 20,000 BP. Much of the earth's water was locked in huge glaciers; sea level was low, exposing many passages that are now covered by straits of water. The northeastern corner of Asia was joined by land to the Americas, thus providing passage for Asians to cross over Beringia and colonize the new continents. Linguists have begun exploring the genetic relations between Chinese and far-flung languages across continents (Ruhlen 1998; Bengtson 1999).

As sea level was lowered by the Last Glacial Maximum, Taiwan was connected to the Asian mainland by land, allowing ancestors of the Austronesian peoples to reach Taiwan on foot. After sea level rose again, many of these peoples sailed out to circle the earth: east to distant islands in the South Pacific, such as New Zealand and Samoa, and

west to Madagascar in the Indian Ocean. This scenario is supported by the fact that Taiwan had the greatest diversity of Austronesian languages until recent decades, when many of these languages became extinct. Taiwan was the launching pad, so to speak, for the great diaspora of this great family of languages (see chapter 9 in this volume). However, this view may not be consistent with recent findings in molecular genetics (cf. HUGO 2009:332).

On a lesser scale, the land bridges allowed the early speakers of Altaic languages to cross over from Korea to Japan, while leaving descendants in northern China who spoke languages that have evolved into modern Uyghur, Mongolian, Manchu, Evenki, and so on. These Altaic peoples have played important roles in China's cultural history. These roles have been especially prominent in the two great dynasties, the Yuan³ (1206–1368), ruled by the Mongols, and the Qing (1616–1911), ruled by the Manchus. A recent census lists their populations at over 5 million and over 10 million, respectively.

Altaic languages are distinguished from most of the languages in China in many ways. Syntactically the verb occurs at the end of the sentence, rather than in the middle. Morphologically the structure is agglutinative in having strings of suffixes after the verb stem. Phonetically Altaic languages are distinguished by vowel harmony, whereby there are restrictions on which vowels may co-occur in the same word. However, this feature is no longer so obvious in the Altaic languages spoken in China due to extensive lexical borrowings from neighboring languages.

Returning to the present geography, the yellow, muddy color of the Huanghe is caused by the fact that it flows out of the loess plateau, carrying with it large amounts of wind-borne clay dust. This sedimentation causes the river bed to build up quickly, leading to massive flooding when not properly controlled. It was his success in dealing with the flooding of Huanghe that made Yu the Great 大禹 a legendary king in Ancient China.

Shortly after it descends from the loess plateau, the Huanghe makes three right-angle turns, first northeastward, shortly after Lanzhou 兰州, then eastward above 40 degrees north, then southward at around 110 degrees east, enclosing in its loop the Ordos region of Inner Mongolia. In this southward course, it separates two provinces with nearly homophonous names: Shaanxi 陕西 to its west and Shanxi 山西 to its east. Last, at around 35 degrees north, it turns sharply to resume its eastward journey, this time separating Shanxi to its north and Henan to its south. At this last turn, the Huanghe is joined by the Weishui 渭水, forming the bottom leg of an immense rectangle.

This general region surrounding where Weishui flows into the Huanghe turning east is often referred to as Zhongyuan 中原 'Central Plains'. It is a region whose significance has been often stressed by historians with terms like 'Cradle of China.' Two cultural centers in this region have played special roles during the two millennia 1000 BCE to 1000 CE: Xi'an and Luoyang, though they had different names at different times. However, recognizing the importance of the Central Plains should not obscure the fact that the Chinese civilization of today is the result of at least 6,000 years of ethnic and linguistic amalgamation, with some sources quite distant from this region.

From its headwaters in the western highlands of Qinghai and Xizang (Tibet), the Changjiang flows southward in parallel with the Nujiang 怒江 and the Lancangjiang 澜沧江. Whereas the other two great rivers flow into Southeast Asia to become the Salween and the Mekong, respectively, the Changjiang is blocked in its path by some massive granite boulders in the vicinity of Shigu 石鼓 in Yunnan. It makes some small hairpin curves and settles on an eastward journey, staying quite close to 30 degrees North. This latitude of 30 degrees is of special interest in the cultural geography of China, being the location of several major cities, from Lhasa in Xizang, to Chongqing in Sichuan, to Shanghai on the Pacific coast.

In addition to the two great rivers, Huanghe and Changjiang, another important waterway should be mentioned: the Yunhe 运河, also called the Grand Canal (Johnson 2013). Construction of this artificial river began in 605 CE. At over 1,700 km, it joined together the regions of the two great rivers, Beijing in the north and Hangzhou 杭州 in the south. At its heyday, the Yunhe was the longest canal in the world and won admiration from many international travelers, including Matteo Ricci (1552–1610) from Italy. Nowadays, however, only its southern half remains consistently navigable.

Wide, fast-flowing rivers often created boundaries to separate peoples in early times, when they lacked the ability to cross them. At the same time, they provided routes to travel along, whether by primitive rafts or boats or simply by foot along its banks, since water is essential for life. It has been speculated that many ethnic groups could have started from the western highlands and migrated along the great rivers, such as the Changjiang.

Such a scenario seems particularly promising for the Austric hypothesis, which includes two major branches—Austronesian and Austro-Asiatic. While many scholars have argued for the historic unity of these two branches of languages, their modern forms are quite different. Austronesian languages typically begin their sentences with verbs and have morphemes that are polysyllabic. The morphemes in Austro-Asiatic languages, on the other hand, are monosyllabic and distinguished by lexical tones, much as in Chinese.

In a pioneering paper of 1976, Norman and Mei proposed some lexical evidence for Austro-Asiatic in South China. Although some of their evidence have been recently called into question (Zhang 1998), the reconstruction of language contact in prehistoric China should continue in a multidisciplinary perspective, in collaboration with archeology and genetics. The latest discussion of Chinese river names is by Takashima (2012).

The Yue 越 peoples mentioned in traditional history books were presumably Austro-Asiatic in their composition; they covered large regions of South and Southeastern China, extending into northern Vietnam. The Zhungzu 壮族 of Guangxi descended from one of the Yue peoples. With a population over 16 million in 2010, it is the largest ethnic minority in China today, second in population size only to the Hans.

There are some precious data on an early Austro-Asiatic language, called the *Yueren Ge* 越人歌 'Song of the Yue People', transliterated with Chinese writing accompanied by a translation. The song was composed in the form of Chuci 楚辞, a genre of poetry from the first millennium BCE. Zhengzhang analyzed this song with the reconstructed

phonology of Old Chinese, which he reconstructed, and compared the verses with Written Thai; written language is typically more conservative than varieties of the spoken language. He concluded his investigation with this remarkable observation:

Although the words of the Yue People's Song may be compared with Siamese, the verses would be easily understood by modern Thai speakers. (1991:167)

There is general consensus among scientists in several disciplines that we anatomically modern humans (AMH) are the only living representatives of the biological genus *Homo*; other species in this genus, such as the Neanderthals and Denisovans, have become extinct. Such knowledge is based on the integration of a variety of evidence offered by many disciplines, including comparative anatomy, physical anthropology, archeology, and especially molecular genetics. We also know that our species, *Homo sapiens*, emerged earliest in Africa. Some members started to leave the homeland to colonize the world over 100,000 years ago. Recent successes with ancient DNA research indicate there was a good deal of interbreeding between AMH and other ancient populations (Pennisi 2013), though so far ancient fossils from China have not yet been analyzed for prehistoric mixing. The success of these early peoples to colonize the world is due to the emergence of language, which qualitatively enhanced their ability to think, communicate, and cooperate. The evolution of languages is always intricately interwoven with the evolution of the peoples who speak them, each enhancing the development of the other.

Among the extinct species is *Homo erectus*, including the famous Peking Man, 北京猿人, found in the caves near the village Zhoukoudian 周口店, on the southwest outskirts of Beijing. Zhoukoudian represents an extremely important archeological site in the study of human evolution because of "repeated human visitations, through eleven major depositional units that span a period of some 300,000 years, its abundance of archeological and faunal residues, and, of course, its unique sample of *Homo erectus* remains."⁴

Peking Man lived some 600,000 years ago (Shen et al. 2009) and was among the earliest users of fire—a trait not found in any other animal. Since the discovery at Zhoukoudian in the 1920s, human fossils, stone tools, and bone artifacts have been unearthed at numerous other sites in China, reaching back well over 1 million years (Wu and Olsen 1985). A notable recent find is at the Zhirendong 智人洞 in Guangxi of a human mandible, which is the oldest fossil from *Homo sapiens* outside of Africa (Liu et al. 2010).

Also worthy of mention here is the remarkable discovery of a set of flutes, made from a crane's leg bones, at Jiayu 贾湖 in Henan (Zhang et al. 1999). The authors call these "the oldest playable musical instruments," and the audio file of a Chinese song played on these flutes can be accessed on the Internet via their publication. This discovery gives us a glimpse of Neolithic culture in China, nearly 9,000 years ago, which was unexpectedly rich.

According to current consensus, AMH emigrated from Africa in many waves, beginning over 100,000 years ago, settling first in Asia. From Asia, the human diaspora spread successively westward to Europe, southward to Australia, and across the Beringia to the

Americas. For most of these 100,000 years, our ancestors lived as roving bands of hunters and gatherers, their movements driven by climatic conditions and the availability of fauna and flora for food. The little we know of their world is based on the material traces they left behind, primarily in the form of fossils and stone tools. Population geneticist Cavalli-Sforza pioneered the multidisciplinary study of human prehistory and gives a general account of current knowledge in this area in his 2000 book (Chinese translation published in 2003).

Contrasting with the out-of-Africa hypothesis, in which the emigrants from Africa completely replaced the earlier archaic *Homo* species, some scholars prefer an alternative scenario in which there was some interbreeding (cf. Abi-Rached et al. 2011). These latter voices favor a multiregional hypothesis, in which archaic humans contributed to the gene pool alongside with the AMH who left Africa 100,000 years ago. Many decades back, Franz Weidenreich, who oversaw some of the first Zhoukoudian excavations in the early 20th century, lectured on the anatomical continuities between Peking Man and the modern Chinese.

Wu Xinzhi 吴新智, a leading authority on Zhoukoudian fossils, continues to explore this line of thought (Wu and Poirier 1995). Interestingly, recent excavations in Zhoukoudian, at a site called Tianyuanandong 田院洞, yielded fossils that are more compatible with the multiregional hypothesis (Shang et al. 2007). Currently the evidence is accumulating that although our modern genes are mostly inherited from ancestors who left Africa 100,000 years ago, there have been admixtures with other archaic species within the *Homo* genus before they became extinct (for a recent report, see Abi-Rached et al. 2011).

After the onset of the Holocene period, the human condition changed dramatically with the advent of agriculture. With the raising of crops and domestication of animals around 10,000 years ago, ancient peoples settled down. With the systematic production of food, they became more numerous, and villages eventually grew into towns and cities. They started making pottery for keeping and transporting food and water and marking the pottery with symbols to identify the maker or the owner.

There were numerous Neolithic villages all over China, which developed relatively independently for many millennia.⁵ These include Dawenkou 大汶口 in Shandong and Zengpiyan 曾皮岩 in Guangxi, among many others. The earliest pottery excavated in China is from Zengpiyan, dating back 10,000 years. The best known of these many sites is the Banpo 半坡 village situated near modern Xi'an, where an on-site museum has been built to preserve and exhibit its remains.

Banpo, dating back some 7000 years, is an example of the Yangshao 仰韶 culture, known for its painted pottery, termed *Caitao Wenhua* 彩陶文化 'colored pottery culture' in Chinese. Yangshao is the name of a village in Henan, where the archeological site was first discovered in 1921 by the Swedish archaeologist Johan Gunnar Andersson⁶ (1874–1960). This discovery is regarded as the beginning of archeology in China. Shortly after the Yangshao discovery, Neolithic pottery of several millennia later was unearthed in Shandong, where the pottery was more delicate and painted black. This became known as Longshan 龙山 culture, called *Heitao Wenhua* 黑陶文化 "black pottery culture" in Chinese.

It is interesting that an average linkage analysis of the cranial indices reported on nine fossil skulls unearthed at these sites revealed a major separation of north and south.⁷ This would suggest that the north/south division among the peoples of China has a very early origin. This division is supported by an extensive immunological study reported by Zhao and Lee (1989), to be discussed later in this chapter. Together with recent advances whereby DNA can be extracted from fossils to examine their genetic affinity,⁸ our understanding of the phylogeny of Asian populations has deepened significantly, thanks to the contributions from molecular genetics (HUGO 2009).

As the scope of these villages increased over time, they met and interacted with greater regularity and frequency, eventually connecting together into one integrated cultural sphere some 6,000 years ago, when there began sustained contact and sharing of cultural innovations. The cultural sphere formed in this way was dubbed the "initial China" by the late Chang Kwang-chih 张光直, whose authoritative volume *The Archeology of Ancient China* guided the field and trained generations of students for several decades (Wang 1999).

Figure 1.1 is reproduced from this classic book (4th edition, 1986:235).⁹ Chang marked off nine Neolithic regions for 6,000 BP and drew arrows to highlight the interaction among them. The identified sites going down the Pacific coast are Hongshan 红山, Tuzhu 土珠, Dawenkou, Majiabang 马家浜, Hemudu 河姆渡, Tanshishan 昙石山, Fenghitou 凤鼻头, and Shixia 石峡. The remaining three sites are Shanbei 山背, Daxi 大溪, and Yangshao. Yangshao is presumably the best known of these cultures, as mentioned earlier, in part because it was the earliest discovered.

In the words of Chang, it was 6,000 years ago¹⁰ that "these cultures became closely linked, and they share common archeological elements that bring them into a vast network within which the cultural similarities are quantitatively greater than without. By this time we see why these cultures are described together: not just because they are located within the borders of the present-day China, but because they were the initial China" (1986:234). Later on, Chang stresses the organic whole of the Chinese culture thus united by the charming metaphor that "When the Weishui River valley sneezed, as it were, the Lake Taihu region caught cold" (1986:410).

Interestingly, a preliminary statistical study done on the basic words of seven Sino-Tibetan languages, using the ideas of glottochronology, also showed that the latest date of common unity among these languages was also approximately 6,000 years ago.¹¹ The top tree in Figure 1.2 is constructed from the basic words in the seven major Chinese dialects. Two pieces of information are inferable from such trees. One is that the linguistic distance between any two dialects is proportional to the sum of the branches along the shortest path that joins them. Thus we see that the distance between Xiamen and Beijing is much greater than that between Suzhou and Changsha.

The other is that the average distance from the root of each tree, drawn here as the left-most vertical line, to the bottom nodes of the tree is approximately proportional to the time depth of the language family the tree represents. We know that much of the dialect differentiation in China started during the Eastern Han dynasty (25–220 CE); this would put the time depth of the top tree of Figure 1.2 at 2,000 years (Wang 1991).

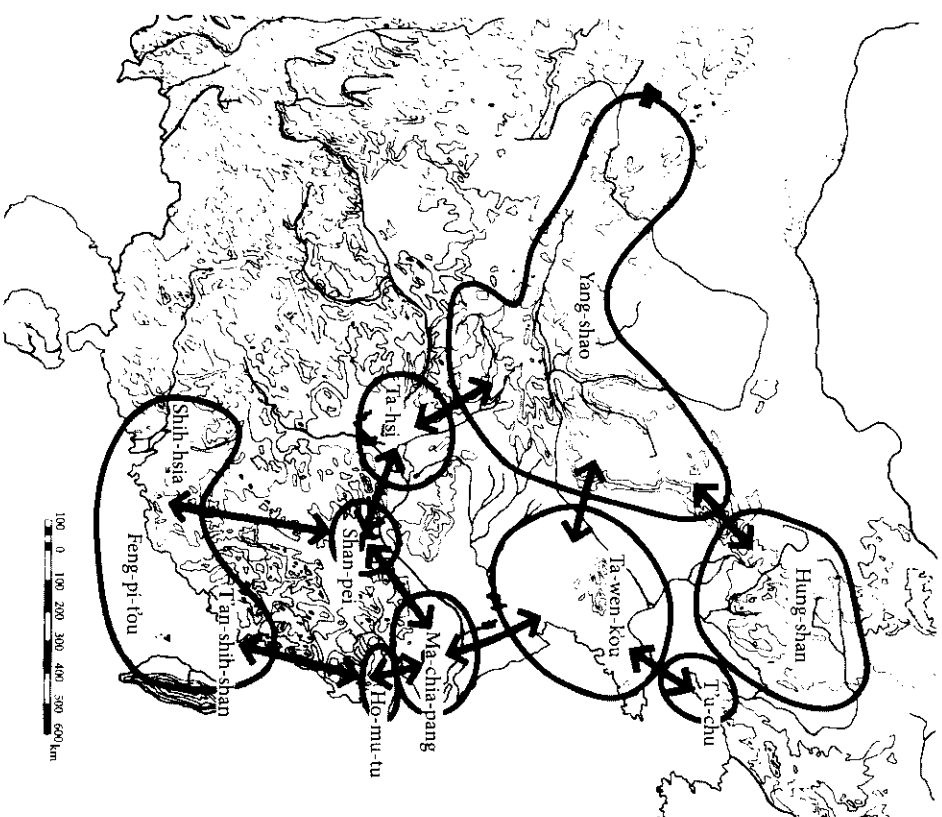


FIGURE 1.1 Cultural interaction in China 6,000 years ago (adapted from Chang 1986:235)

The tree in the middle of Figure 1.2 is constructed from seven languages of the Indo-European family selected for comparison. Note that the three Germanic languages in this tree have approximately the same time depth of the Chinese dialects; they are similarly distant to the non-Germanic languages on the tree. Since all three trees in Figure 1.2 have the same time scale, the time depth of the Indo-European tree is around 7,000 years, which is consistent with estimates given by some archeologists.

Finally, the tree at the bottom of Figure 1.2 is a Sino-Tibetan tree constructed on data from Beijing and from six Tibeto-Burman languages. While these data are still preliminary in nature, it is interesting that the time depth computed this way is around 6,000 years, the same time range estimated by Chang from archeology for the formation of "initial China." Presumably there was extensive population movement at that time, initiating language differentiation. The Sino-Tibetan tree in Figure 1.2 is a tentative quantitative statement of this presumption.

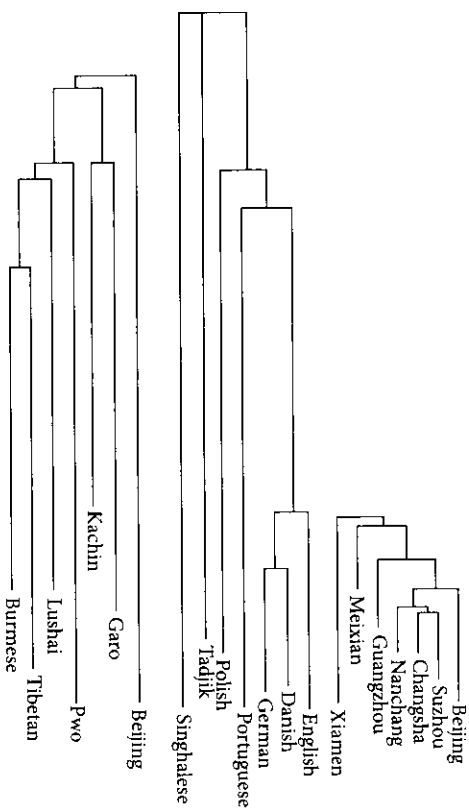


FIGURE 1.2 Relative time-depth of language groups (Wang 1998:530)

The Sino-Tibetan family of languages is a hypothesis that has long been in the literature, before much information has been gathered on Tibeto-Burman languages (Wang 1995; van Driem 2008). The name implies a coordinate relation between Chinese, or Sinitic, on the one hand and all the hundreds of Tibeto-Burman languages on the other. It therefore implies that Sinitic split off from all other members 6,000 years ago; evidence for such an initial bifurcation is lacking.

Such a view may not be correct—it may have been unduly influenced by the dominant position gained by one of the groups, the Hans, over the past 2,200 years, when China was united into one empire under the Qin 秦. However, if we accept that Sino-Tibetan is some 6,000 years old, then the Han dominance occurs in only the last third of the time depth of the family. George van Driem has been exploring alternative phylogenies for this family; see chapter 10 in this volume, as well as chapter 3 for a different viewpoint.

Unlike the Mongols and Manchus, who established major dynasties in Chinese history, the Tibeto-Burman peoples had never completely subjugated the Hans. Instead they had kingdoms of various sizes in parts of western China, including the Xixia 西夏 in the north and Dali 大理 in the south, each achieving relative autonomy and a high degree of regional culture over 1,000 years ago. The Xixia, also known as Tangut, had left behind a considerable number of texts in their own script. These materials have been invaluable in the reconstruction of Sino-Tibetan, as for instance in the contributions by Gong (1995).

The earliest specimen of a Tibeto-Burman language is called *Bailang Ge* 白狼歌 “White Wolf Song,” dating back to the beginning of the Common Era. Although *Bailang* was transcribed with characters that mean “white wolf,” it is much more likely that the transcription was based on just phonetics. Like the Yueren Ge discussed earlier in connection with Austro-Asiatic languages, the *Bailang Ge* was written in Chinese and therefore could not be properly analyzed without reconstructing the phonetic values of the Chinese spoken at that time. This approach was taken up by Coblin (1979) as a contribution toward understanding this important family of languages.

There are scanty pieces of information about the minority languages of China scattered in the ocean of Chinese history books. For example, there are about a dozen words from some Tibeto-Burman languages of Yunnan that can be found in the *Man Shu* 蛮书, compiled in the Tang dynasty (618–907). But systematic studies of the Tibeto-Burman languages have only begun in recent decades.

Although there are several Tibeto-Burman languages with more than 1 million speakers (Tujia 土家, Yi 彝, Zang 藏, Bai 白, Hani 哈尼), all minority languages are losing ground rapidly with the steady pressure of increasing populations and interaction with international business. Such situations call for more studies of languages in contact (Chen 1996), of the sort exemplified by Wang’s (2006) recent investigation of Bai. Only after we have a much fuller picture of the Tibeto-Burman languages can we confidently answer the important question of the genetic affiliation of Chinese.

In addition to the Tibeto-Burman peoples, and the Altaic and Austric peoples discussed earlier in this chapter, we should also mention forays of Indo-European peoples into Xinjiang several thousand years ago (Pulleyblank 1996). The earliest immigrants date back at least 3,000 years, leaving behind mummies relatively well preserved in the dry desert climate (Mallory and Mair 2000). Their early presence around the Tarim Basin has been associated with the Tocharian language, preserved on fragments that can be dated to the 5th century CE. Modern representatives of Indo-European are the more than 40,000 speakers of Tajik in western Xinjiang.

With the striking advances in human genetics in the second half of the 20th century, methodologies have been developed to quantify the genetic affinity among human populations. While it is well known that peoples can adopt languages from others, it is nonetheless informative to compare genetic affinities among peoples with the affinity of their languages. This is an exciting approach pioneered by Cavalli-Sforza et al. (1988) that merits deeper exploration.

An early effort to quantify the genetic affinity of Chinese populations on a large scale is that reported by Zhao and Lee (1989). Their study examined the Gm and Km allotypes of 74 populations distributed widely over China. The genetic affinity among these populations has been presented in the form of a phylogenetic tree, reproduced in Figure 1.3.

As the tree shows, the initial bifurcation here is into populations belonging to the Huanghe region and those belonging to the Changjiang region. Within each region, there is a mixture of ethnic Hans with other ethnic groups. For instance, the upper part of the tree includes Uyghur, Kazaks, Mongols, and Koreans, among others. The lower part of the tree includes Tujia, Bai, Yi, and Miao, among others.

An important finding of their study is that genetic affinity correlates with geographical distance rather than ethnic identity. Thus we can see in the upper part of the tree that Han population #15 is genetically very close to the Korean population #16 and less close to another Han population, #17. Number 15 is much more distant genetically from #42, though they are both Hans. Many such comparisons can be given for both parts of the tree. In other words, genetic affinity is sometimes better reflected by geography than by ethnic labels. For a comparable finding in another part of the world, see Manica et al. (2005). This comparison can be expressed by a popular Chinese saying: *yuangjin buru*

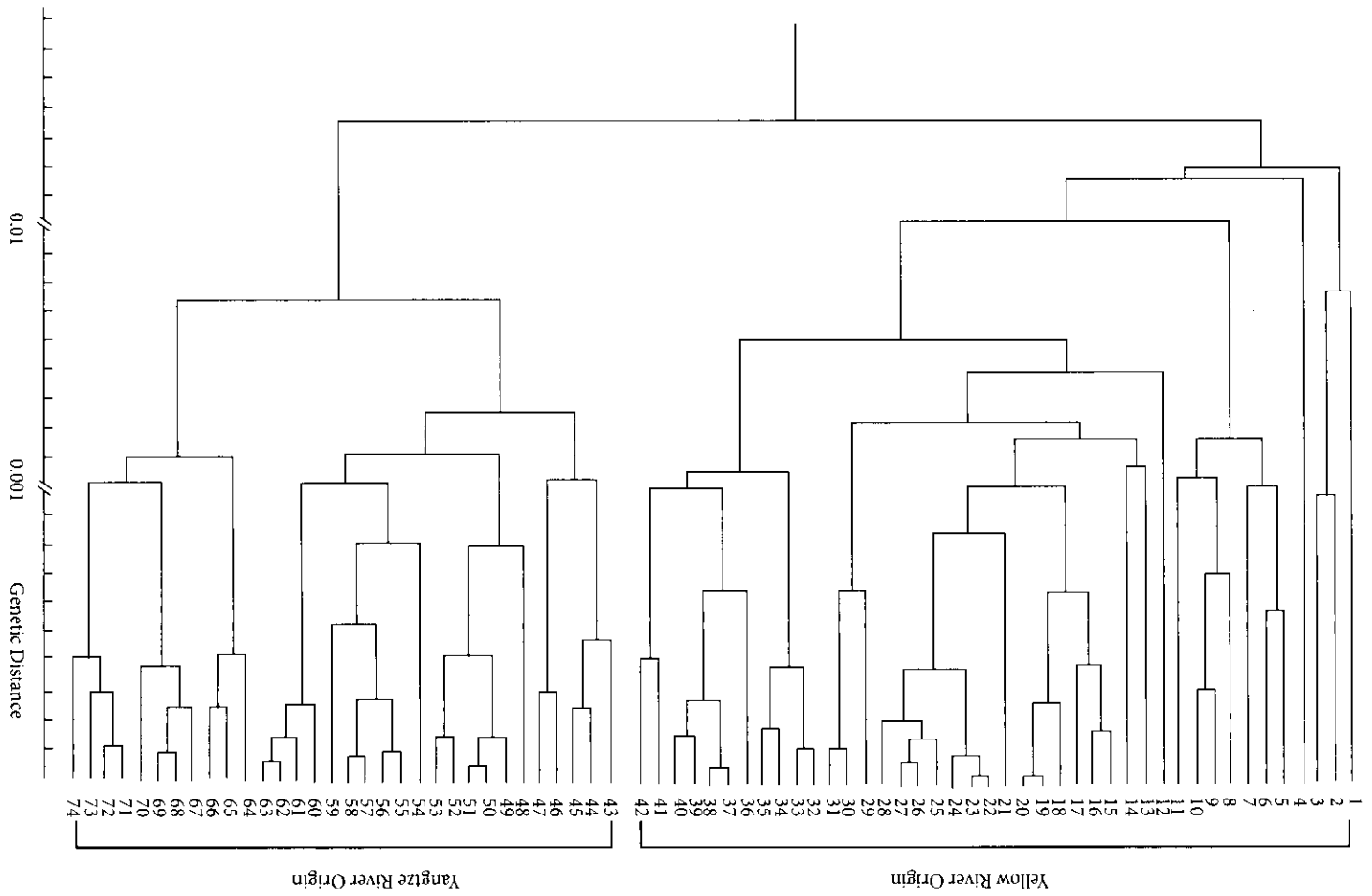


FIGURE 1.3 Genetic tree of Chinese populations (Zhao and Lee 1989:104)

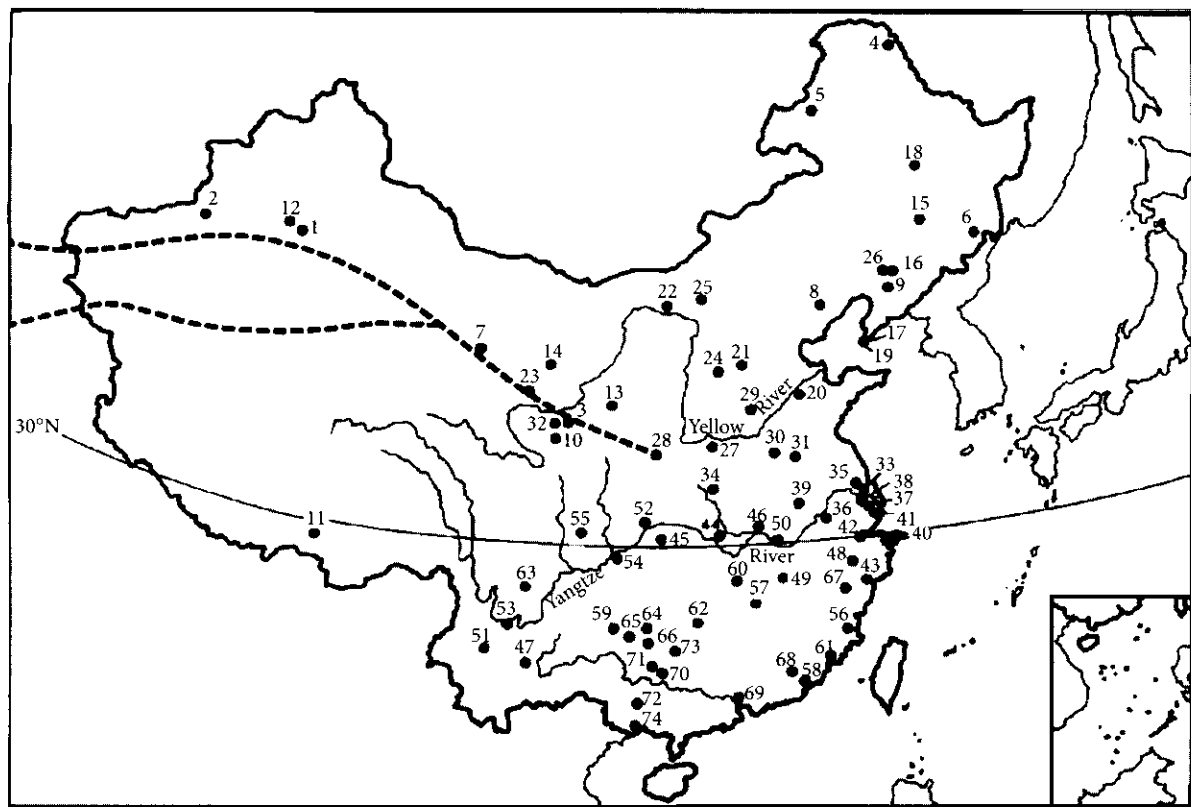


FIGURE 1.4 Spatial relations among Chinese populations (Zhao and Lee 1989:102)

jinyin 远亲不如近邻 “relatives faraway are not as good as neighbors nearby.” Although the ethnic identities are preserved, together with various degrees of the language in some cases, the many centuries of interaction among the populations have produced a strong degree of genetic homogenization over large regions.

Figure 1.4 tells another interesting aspect of the story, namely that there is a major geographical divide between the sites in the upper and lower part of the tree. The latitude of 30 degrees gives a good approximation of this separation. The hypothesis such a divide suggests is that the peopling of China can be traced to two sources, one northern and the other southern.

Molecular genetics has made giant strides since the Zhao and Lee report of 1989. Twenty years later, an international consortium of geneticists, including Jin Li 金力 of Fudan University in Shanghai, has probed the genetic history of China with much richer data and much more powerful statistical methods. Their report (HUGO Pan-Asian SNP Consortium et al. 2009) delves much more deeply into the issues of the multiple origins of the Chinese people. The report is generally consistent with the hypothesis of Cavalli-Sforza and Feldman (2003) that AMH entered East Asia via a southern coastal route, followed by a northern route through West Asia.

With the writing on oracle bones in the Shang dynasty (16th c. BCE–1046 BCE), China entered the historical period, where inferences about the past can be based on written documents. Metallurgy in China began at around the same time, giving us abundant inscriptions on bronze vessels. These early materials are invaluable first-hand data on the peoples and languages of China, beginning over 3,000 years ago. For samples of these early inscriptions, see Wang (2013).

To complement these materials on the written language, there are also materials that better reflect the spoken language of the time, notably the rimed songs and poems anthologized in the *Shijing*. The combined study of these two sources, the written and the spoken, can help us paint a richly textured picture of the languages and peoples of Ancient China, an opportunity unique among the civilizations of the world (Wang 2013).

There is a Chinese saying that applies to the fortunate position that Chinese linguistics is now in: *De tian du hou* 得天独厚—Chinese linguistics is especially blessed by Heaven, in having at its disposal such an unrivaled legacy of materials to investigate, toward an ever deepening understanding of the peoples and languages of China, both in space and in time.

NOTES

1. The British named it Mount Everest, apparently not aware that the mountain already had a name that dated back several centuries. A Chinese name for the peak is *Shengmufeng* 圣母峰, which is an approximation to the Tibetan meaning.
2. Sections of the Changjiang also have other names: *Jinshajiang* 金沙江 for its initial section and *Yangzijiang* 扬子江 for its middle section. The spelling *Yangtze* is an older form of *Yangzi*.

3. Dates for dynasties in this chapter follow those given in the *Xin Hua Zidian* 新华字典 (11th ed., 2011).
4. The quote is from the American anthropologist F. Clark Howell in his introduction to Wu and Olsen (1985:xx).
5. See Wu and Olsen (1985) for a fuller listing of these sites.
6. Another Swedish scholar whose work is of great importance was Bernhard Karlgren 高本汉 (1889–1978), a younger colleague of Anderson. Karlgren introduced linguistics methods developed in Europe to China and exemplified these methods with dialect studies as well as historical reconstruction. Anderson founded the famous Museum of Far Eastern Antiquities in Stockholm in 1926; Karlgren succeeded him as director of the museum (1939–1959).
7. Wang 1998, Figure 1.
8. Green et al. 2010.
9. The names in Figure 1 are written in the Wade-Giles spelling, which was widely used in Western literature until it was replaced by Hanyu Pinyin. Archeology has progressed tremendously over the last several decades since Chang 1986. See Chang 1999. A good overview of the current state of knowledge is the elegant volume Chang and Xu 2005.
10. This date is 1,000 years earlier than the traditional folk view in China that the civilization dates back 5,000 years.
11. Wang 1998, Figure 4.

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CHAPTER 2

THE CLASSIFICATION
OF CHINESE*Sinitic (The Chinese Language Family)*

ZEV HANDEL

In the popular conception, Chinese is usually treated as a single language with many regional dialects (*fāngyán* 方言). There are political and cultural justifications for this conception. The different regional varieties of Chinese are spoken by people who identify as a single nationality and ethnicity, with a shared cultural history. Moreover, educated Chinese people all use the same written language, Modern Standard Written Chinese. A literate Chinese speaker can pick up a newspaper or magazine published in Shànghǎi, Guǎngzhōu, Tàipei, Běijīng, or Chángshā and, with few exceptions, will have no difficulty reading and understanding it.

From the perspective of modern linguistics, however, the popular view of Chinese as a single language with many dialects is problematic. Linguists consider two distinct varieties of speech to be dialects of a language if they are *mutually intelligible*, that is, if a speaker of one variety can understand a speaker of the other variety and vice versa. Two distinct varieties of speech are considered different languages only if they are not mutually intelligible. By this definition, Chinese cannot be considered a single language. Speakers of Hong Kong Cantonese, Shanghainese, Taiwanese, and Beijing Mandarin cannot understand each other. Linguists therefore speak of Chinese not as a single language but as a family of closely related languages, much as the Romance languages (French, Spanish, Italian, Portuguese, etc.) make up a family of closely related languages. And just as the Romance family is descended from a single common ancestor, Latin, the Chinese languages are descended from a single common ancestor, most probably a form of late Old Chinese dating to the Han dynasty or slightly earlier. Languages that share a common ancestor and so form a language family are said to be *genetically related*.

In order to emphasize that Chinese is a family, rather than a single language, and to avoid the ambiguities inherent in the term “Chinese,” some scholars prefer the term *Sinitic* to refer to the Chinese languages. We adopt this practice in this chapter.

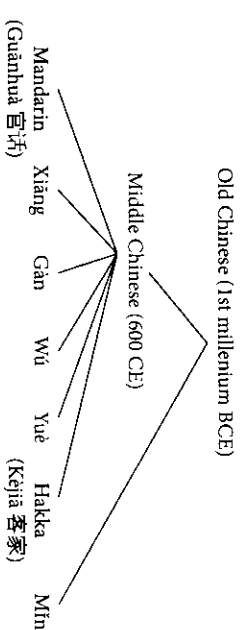


FIGURE 2.1 Tree model of the Sinitic family

Sinitic is made up of at least a dozen distinct languages and perhaps more than twenty. Each of these languages in turn has many regional dialects. For example, the language of Běijīng and the language of Xī'ān are mutually intelligible but, as anyone who has traveled to both places can attest, quite distinct. These forms of speech are, from the linguistic perspective, two regional dialects of the Northern Mandarin language.

Linguists represent language families with tree diagrams, which model the historical divergence of languages from a single ancestor over time. Although such trees are oversimplified models of language history, they can be useful tools for providing a generalized overview of the relationship among related languages. The Sinitic family tree is typically presented as seen in Figure 2.1.

The “leaves” at the bottom of the tree are the names of the seven most commonly recognized Chinese *dialect groups*. The classification of varieties of Chinese into these groups is based on shared geographic and linguistic features. The groups correspond only roughly to “languages” as defined based on mutual intelligibility. For example, the Min 閩 group contains a number of mutually unintelligible varieties and should properly be considered as a collection of several different languages. On the other hand, the varieties traditionally labeled “Mandarin” are similar enough to each other that most of them can justifiably be viewed as dialects of a single language. The common ancestor from which the Sinitic languages descend is a variety of Old Chinese. The conventional view, which has rightly been challenged in recent decades, is that all Chinese dialect groups (other than Min) descend from the medieval northern Chinese language known as Middle Chinese. This conventional view is represented in the diagram. See chapter 11 in this volume for more details on Sinitic languages and dialects.

2.1 LANGUAGE FAMILIES OF EAST
AND SOUTHEAST ASIA

Linguists have long wondered whether Old Chinese itself can be shown to share a common ancestor with any non-Sinitic languages. That is to say, they have wondered whether Sinitic belongs to a larger language family of which it forms a sub-branch. Since the 18th century, linguists have recognized that the Romance family, descended from Latin, is

just one branch of a much larger family with a more distant common ancestor. This larger family is known as Indo-European, and its branches include not just Romance but also the Germanic languages (of which English is a member), the Slavic languages, and the Indic languages, among others. The ancestor of the Indo-European family is much older than Latin; some scholars believe it was spoken as many as 8,000 years ago.

It was only in the 20th century that a clear picture of the language families of East and Southeast Asia emerged, and this in turn allowed more plausible hypotheses to be put forward concerning the broader genetic affiliations of Sinitic. Increasingly sophisticated reconstructions of Old Chinese (see chapter 5 in this volume on Old Chinese) as well as of other ancient languages of Asia have also served to stimulate work on broad genetic affiliations in the region. Nevertheless, much remains unknown, and many competing hypotheses are still being debated in the field.

The major language families of East and Southeast Asia, aside from Sinitic, are

- (1) Tibeto-Burman, a large family of languages spoken as far west as India and as far south as peninsular Southeast Asia. This family is named for its two most prominent members, Tibetan and Burmese.
- (2) Hmong-Mien (also referred to by the Chinese name Miao-Yao), a small family spoken by ethnic minorities in southern China and parts of peninsular Southeast Asia.
- (3) Tai-Kadai (also called Tai and Kam-Tai), a small family spoken in southern China and throughout Southeast Asia. Its most well-known members are the national languages of Thailand and Laos.
- (4) Austroasiatic, spoken in peninsular Southeast Asia and as far west as the Indian Ocean and a few small enclaves in India. The sub-branch known as Mon-Khmer includes Khmer (the national language of Cambodia) and Vietnamese.
- (5) Austronesian, a large family spoken by the native peoples of Taiwan (see chapter 9 in this volume), across insular Southeast Asia, and throughout the island nations of the Pacific. This family includes the well-known Malayo-Polynesian languages Indonesian, Tagalog, and Hawaiian.

The validity of these language families is not in dispute. That is to say, scholars are in agreement that each of these families is indeed made up of genetically related languages sharing a common ancestor. In all five cases, linguists have made good progress reconstructing the ancestral language of each group, known respectively as Proto-Tibeto-Burman, Proto-Hmong-Mien, Proto-Tai-Kadai, Proto-Austroasiatic, and Proto-Austronesian.

2.2 WIDER AFFILIATIONS

What is not agreed upon is the nature of the historical relationships among these five groups and Sinitic. (For example, a recent proposal by Sagart [2005b] that Tai-Kadai is

in fact part of the Austronesian family has been gaining support.) All six of these groups share certain common characteristics that suggest the possibility that some or all derive from a single common ancestor spoken many thousands of years ago. But it is also possible that some of these similarities are due not to inheritance from a common ancestor but to borrowings among the languages that occurred in ancient times when their speakers interacted. Also, some scholars have argued, not without justification, that the current techniques available to historical linguistics are insufficient to answer questions about genetic affiliation at the time depths at issue here.

2.3 THE SINO-TIBETAN HYPOTHESIS

The most widely accepted hypothesis concerning the deeper ancestral relations of Sinitic is the Sino-Tibetan hypothesis. This hypothesis has taken many forms and gone by a number of different names over the past 200 years. Today, two forms of the hypothesis have wide currency. The narrow form of the Sino-Tibetan hypothesis states that Sinitic and Tibeto-Burman are genetically related and share a common ancestor known as Proto-Sino-Tibetan (Matisoff 2003; Thurgood and LaPolla 2003). Most Western specialists have adopted this hypothesis. It can be represented by the family tree in Figure 2.2 (in which “Chinese” represents the entire Sinitic family).

This narrow Sino-Tibetan hypothesis has some variants. For example, van Driem (1997) has proposed that Sinitic and Tibeto-Burman are not two distinct branches of the family; rather, Sinitic is simply a branch within Tibeto-Burman. This is shown in Figure 2.3, in which the term “Sino-Tibetan” does not appear and Sinitic is identified as the Northeastern branch of Tibeto-Burman. For van Driem’s more recent views, see van Driem 2005 and 2007 and chapter 10 in this volume.

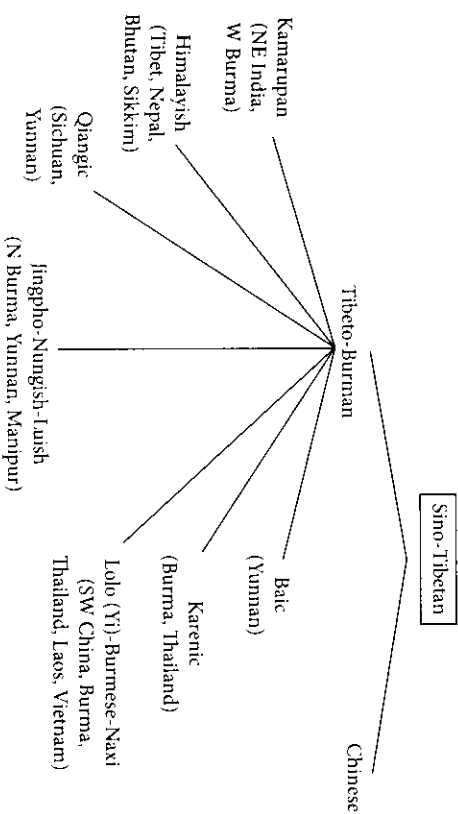


FIGURE 2.2 The Sino-Tibetan family (Matisoff 2003)

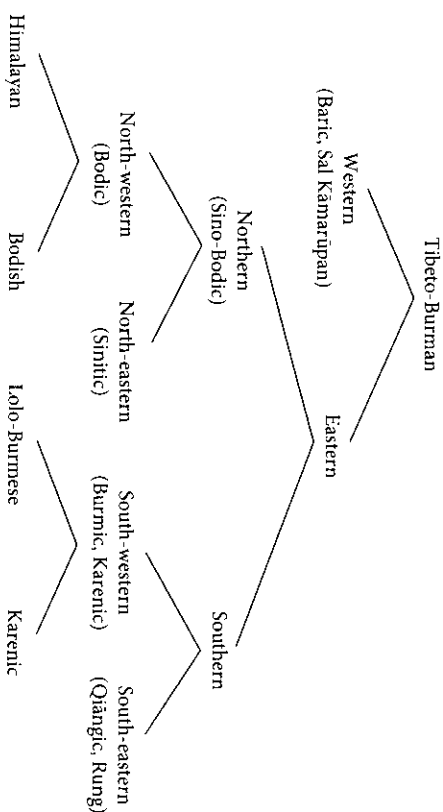


FIGURE 2.3 The Tibeto-Burman family, including Sinitic (van Driem 1997)

The evidence for a genetic relationship between Sinitic on the one hand and Tibetan, Burmese, and all the other Tibeto-Burman languages on the other is varied and complex. But an argument can be made using just a few key data points. Consider the words for ‘five’, ‘fish’, and ‘r’ in reconstructed Written Tibetan, Written Burmese, and Old Chinese (Handel 2008:425, with updated Old Chinese reconstructions from Baxter and Sagart 2014).

The chance of the three words being nearly homophonous in all three languages by coincidence is vanishingly small; the chance of all three basic vocabulary words being borrowed among these languages is also remote. The most convincing explanation for the data is that all three languages shared a common ancestor in which the words for ‘five’, ‘fish’, and ‘r’ were all pronounced something like *ŋa*. The hypothesis is further strengthened by the existence of common morphological affixes in both families. Most notably, both Tibeto-Burman and Old Chinese had a prefix *s-, which derived causative verbs from noncausative verb stems. (See chapter 4 on morphology in this volume.)

In contrast to the view that relates Sinitic only to Tibeto-Burman, the broad form of the Sino-Tibetan hypothesis states that Sinitic and Tibeto-Burman are also related to Tai-Kadai and Hmong-Mien, which all form a large Sino-Tibetan family descended from a single ancestor. Most specialists in China subscribe to this form of the hypothesis (Ting and Sun 2000). This hypothesis is based on typological similarities (all these families are characterized by languages that are monosyllabic, isolating, and tonal) and the existence of similar vocabulary words among all four groups. However, as Ratliff (2010) has forcefully argued, these similarities are more likely due to early contact and borrowing than to genetic relationship. For one thing, patterns of similarity in basic vocabulary, like those words seen in Figure 2.4, are lacking if we compare Old Chinese with Proto-Tai-Kadai or Proto-Hmong-Mien. For another, we now know that typological traits are relatively easily transmitted through contact. For example, Vietnamese was once an atonal, non-monosyllabic language like other members of the Mon-Khmer family but has become tonal and monosyllabic under the influence of Chinese.

| | Written Tibetan | Written Burmese | Old Chinese |
|--------|-----------------|-----------------|-----------------------|
| ‘five’ | l-ŋa | ŋ á | *C. ŋ ^h a? |
| ‘fish’ | ŋa | ŋ á | *[r-ŋ]a |
| ‘r’ | ŋ a | ŋ a | *ŋ a |

FIGURE 2.4 Words for ‘five’, ‘fish’, and ‘r’ in Tibetan, Burmese, and Chinese

2.4 THE SINO-AUSTRONESIAN HYPOTHESIS

The French scholar Laurent Sagart proposed in 1994 that Sinitic and Austronesian are genetically related and that similarities between Sinitic and Tibeto-Burman were the result of contact. Sagart (2009a) later accepted the Sino-Tibetan hypothesis (in its narrow form) and revised his proposal to argue that Sino-Tibetan shares a more distant common ancestor with Austronesian. This proposal is based both on lexical comparisons and on shared morphological processes. While Sagart’s proposal has not been widely accepted, it is an intriguing alternative to the standard Sino-Tibetan hypothesis and will certainly be subject to further evaluation and revision in coming years.

2.5 OTHER HYPOTHESES

A number of scholars have argued that all six of these language families share a single common ancestor. This proposed “super-family” has been called by various names, including Sino-Austrić (Huá-Ào 华澳) and Yangtzean (Pan 1995, 2005; Zhengzhang 2000). Starosta (2005) referred to the common ancestor of this super-family as Proto-East Asian. According to this hypothesis, nearly all of the languages of East and Southeast Asia ultimately descend from a common ancestor. The size and diversity of this super-family would imply that the languages diverged from their common ancestor a very long time ago, perhaps more than 10,000 years ago; since that time their complex histories and interactions would have obscured much of their common inheritance, leaving only hints and traces. This hypothesis tests the limits of the current methodologies of historical reconstruction and comparative linguistics; it may therefore be neither provable nor refutable and will likely not gain wider currency among scholars in Asian linguistics. (For more on the notion of “Austrić” and possible genetic relations, see chapter 8 on Austrić languages in this volume.)

2.6 CHALLENGES AND FUTURE DIRECTIONS

One might well ask why it is so difficult to establish genetic affiliation and to achieve certainty about the ancestry of Chinese and the genetic relationships between Sinitic and

other language families in the region. There are a number of reasons. First, until recently scholars were limited to the comparison of modern Asian languages, aided by only a few ancient written languages such as Tibetan and Burmese. Because many languages of the region have changed considerably over the past several thousand years, their comparison did not always reveal deeper underlying connections. The European linguists who first established the existence of the Indo-European family were fortunate to have written records from many ancient languages including Latin, Greek, Sanskrit, Gothic, and Old Church Slavonic, which helped them to recognize the historical connections among the Indo-European languages. If these linguists had been restricted to the comparison of modern German, modern French, modern Russian, and modern Hindi, their work would have been considerably more difficult if not impossible. In East Asia fewer languages have long written traditions than in Europe; and unfortunately Chinese, the language in the region with the longest written tradition, is written in a nonalphabetic script that obscures ancient pronunciations.

Second, the exceedingly complex migration patterns in East and Southeast Asia brought about intensive, long-term contact among languages in different families. This contact has resulted in borrowing of vocabulary words and of typological features, and such similarities can be difficult to disentangle from similarities that reflect a common genetic origin. Sorting out layers of borrowing and isolating ancient features from newer features is a difficult and time-consuming task that has not yet been completed, although good work is being done in this area. (See chapters 15 and 19 in this volume.)

Third, the typologies of most East and Southeast Asian languages make it difficult to prove genetic relationships. The most obvious similarity among related languages is in vocabulary; related languages share *cognates*, that is, words of common origin. We have already seen that Tibetan, Burmese, and Chinese share cognates for the words 'five,' 'fish,' and 'I'. But vocabulary is the easiest aspect of language to borrow when speakers come into contact. Japanese and Korean, which are not genetically related to Sinitic, have nevertheless borrowed a staggering amount of vocabulary from Middle Chinese, making their lexicons appear very similar to the lexicons of Sinitic languages. (See chapters 16 and 17 in this volume.) Because of the difficulty of determining whether similar vocabulary is the result of common inheritance or of contact-induced borrowing, historical linguists believe that morphological patterns are more reliable indicators of genetic relationship. In particular, irregular morphological paradigms are known to be extremely resistant to borrowing and are thus an excellent diagnostic for genetic relationship. Consider, for example, the Latin and Gothic third-person forms of the irregular verb 'to be':

| | | |
|--------|-------------------------------------|----------------------------------|
| | third-person singular ('he/she is') | third-person plural ('they are') |
| Latin | <i>est</i> | <i>sunt</i> |
| Gothic | <i>ist</i> | <i>sind</i> |

Because it is believed to be impossible for an irregular paradigm of such a basic verb to be borrowed from one language into another, these four words in and of themselves can be taken as proof that Latin and Gothic share a common ancestor; indeed, some would consider these four words alone to be proof of the existence of the Indo-European family.

Unfortunately, the languages of East and Southeast Asia largely lack inflectional morphology of the type seen in European languages. Linguists have been forced to rely primarily on lexical comparison to establish hypotheses about relationships, and those hypotheses are, as a result, inherently more speculative.

Fourth, reconstructed forms of ancestral languages have either been lacking or inadequate. To some extent, reconstructed ancient pronunciations can help to make up for a lack of ancient written records. But until recently, these reconstructions have been fluid and uncertain. This is now changing: increasingly reliable and sophisticated reconstructions not only of Old Chinese but of ancestral languages like Proto-Hmong-Mien are emerging (cf. Ratliff 2010). This has permitted more detailed comparisons of vocabulary, helping to distinguish true cognates from borrowed lexical items, and is also revealing ancient morphological processes in greater detail. Comparison of these processes across language groups should provide more reliable results as hypotheses about genetic relationship are tested. (See chapter 4 in this volume.) Specialists are also developing a deeper understanding of ancient syntactic structures, which might also help to determine linguistic affiliations. (See chapter 3 in this volume.)

There is good reason to think that ongoing progress in our understanding of the histories of Sinitic, Tibeto-Burman, Hmong-Mien, Tai-Kadai, Austronesian, and Austroasiatic will improve our understanding of the complex interactions among languages in these groups and ultimately help to resolve outstanding questions about ancient affiliations among them, including the question of which languages are genetically related to Chinese. But this is not the only avenue of promise. Some scholars are actively engaged in developing new approaches and methodologies that may be better suited to the historical conditions in which East and Southeast Asian languages developed.

New techniques may allow historical linguists to move beyond the restrictions that have typically applied in the field. Lexical replacement over time means that comparison of inherited shared vocabulary will encounter time-depth limits. In other words, with sufficient passage of time, we would not expect genetically related languages to retain enough shared cognates for meaningful comparison. But it is possible that historical linguists will discover other features of language that are highly stable, resistant to both loss and change, over longer periods of time (see Nichols 2006 for an example).

Moreover, interdisciplinary collaboration between historical linguists on the one hand and specialists in population genetics and archeology on the other may help to elucidate ancient patterns of migration in East and Southeast Asia, which can in turn help to support or refute hypotheses about linguistic affiliation. Demographic and genetic

data are not definitive—after all, we know that human beings can change their mother tongue within a single generation, regardless of genetic and geographic position—but they can suggest reasonable hypotheses about language contact and help us decide whether hypotheses concerning genetic affiliation are plausible.

We can therefore expect that coming decades will yield new insights, and perhaps new breakthroughs, in our attempts to uncover the ancestry of Chinese in the context of Asian languages.

FURTHER READING

On different hypotheses and controversies concerning the genetic position of Sinitic, see Wang (1995), Handel (1998), Matisoff (2000), Sagart et al. (2005), and van Driem (2005).

For more on new methodologies, see Wang (2006) on the distillation method and Chen and He (2002) on rank analysis.

Finally, a number of chapters in this volume reflect the most up-to-date scholarship on many issues raised here.

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CHAPTER 3

SINO-TIBETAN SYNTAX

RANDY J. LAPOLLA

3.1 INTRODUCTION

The Sino-Tibetan language family is second only to Indo-European in number of speakers, though its geographic distribution is restricted to a relatively small area (China, Myanmar [Burma], Nepal, Bhutan, northern India, and some bordering lands). Much work has been done in reconstructing the sound system and lexicon of this family (see for example Benedict 1972; Bodman 1980; Coblin 1986, Matisoff 2003), as well as the morphology (e.g., LaPolla 2003, 2004, 2005 and references therein), but very little has been said about the nature of Sino-Tibetan syntax. If we are to establish a definite link between the different branches of Sino-Tibetan, we must explain the divergences in word order: the modern Sinitic varieties are generally verb-medial, with adjective-noun, genitive-head, relative clause-head, and number-measure/classifier-noun order; on the Tibeto-Burman side, Karen and Bai are also generally verb-medial and have relative clause-head and genitive-noun order but have noun-adjective and noun-number-measure order, while the rest of the Tibeto-Burman languages are all verb-final and generally have noun-adjective (and secondarily adjective-noun), genitive-head, relative clause-head, and noun-number-measure order.

Unlike Indo-European, where there is abundant ancient textual evidence, to the extent that it is sometimes possible to have an exact match between text fragments in two different languages within the family (see Watkins 1989), in Sino-Tibetan the time between the break-up of the family into Sinitic and Tibeto-Burman and the development of writing on both sides of the family¹ was long enough to allow one or both sides of the family to change radically. Also unlike Indo-European, what was written about in the earliest attestations of Chinese (divinations) and Tibetan (translations of Sanskrit Buddhist texts) are unrelated, so the chance of similar phrases appearing in both is extremely slim. What we need to do then is analyze the attested languages and then work backward from them, “undoing” the changes that have occurred and project back along that trajectory to the parent language.

3.2 SINITIC

Work on Old Chinese and Modern Mandarin has shown Chinese overall to be consistently topic-comment, though the particular constructions used in the different periods have changed considerably. Even within the period that we refer to as Old Chinese, the language shows significant changes that we might trace back to a change in information structure. Unfortunately, we do not have detailed analyses of most of the Sinitic varieties other than Mandarin. Due to the mistaken assumption that the grammar of all Sinitic varieties is basically the same, until recently very little work was done on the grammar of Sinitic varieties other than Mandarin. In particular there has been little work on how information structure affects clause structure in the varieties other than Mandarin. One study that was done (Lee 2002) showed that there are differences between Mandarin and Hong Kong Cantonese in this regard. It would be good, then, if other varieties were investigated in this regard.

Modern Mandarin has been shown to be a language in which constituent order is not governed by syntactic relations such as subject and object but by information structure, with the basic clause structure being topic-comment (Chao 1968; Lü 1979; LaPolla 1995, 2009; LaPolla and Pea 2005, 2006). If Givón (1979) is correct in assuming that languages develop from having more pragmatically based syntactic structures to having more syntactically based structures (as we assume now regularly in discussions of grammaticalization), then the hypothesis should be that since syntax in Modern Mandarin is heavily weighted in favor of pragmatic factors, we should find the same or an even stronger tendency toward pragmatic control of syntax in Old Chinese. In fact Wang Li (1985:8ff) earlier argued for two periods in the history of Chinese, an earlier “not yet fixed grammar” period and a “fixed grammar” era. In the former period, the grammar is loose, as if there is no grammar (Wang Li 1985:9), and he gives examples of structures from that period that are no longer acceptable. Wang Li (1985), Wang Kezhong (1986), and Hertforth (1987) all argue that Old Chinese is very much a discourse-based language, so much so that individual sentences very often cannot be interpreted properly outside the full context in which they appeared. Serruys (1981:356) states that in the oracle bone inscriptions (the earliest Chinese), “there are no particles to mark either concessive or conditional subordinate clauses; *everything seems to be implied by context*” (emphasis added; see also Takashima 1973:288–305). This radical ambiguity even extends to where, in NP, V NP₂ constructions, NP₁ and NP₂ can both be either actor or undergoer, depending on the context or knowledge about the referents represented by the NPs (Wang Kezhong 1986). Gao (1987:295) gives examples from the oracle bone inscriptions in which the actor and the undergoer, and even the goal, all appear after the verb.

Discussions of word order in Old Chinese generally start out with a statement to the effect that the most common word order is verb-medial for transitive sentences, just as in Modern Mandarin, so word order has been basically stable, but that there are a number of other word order patterns, particularly verb-final clauses (e.g., Wang Li 1980; Dai 1981; Gao 1987). These clause types have the undergoer (or goal) immediately before the verb, as in (1a–c), from the *Zhaohuan* (4th century BCE; the words in bold are the “preposed objects”: Modern Mandarin forms in Pinyin are used instead of reconstructions, as phonology is not at issue here)?

- (1) a. 我无尔诈，尔无我虞。（左传，宣公十五年）
 Wo wu er zha er wu wo yu. (Xuan Gong, Year 15)
 1sg NEG 2sg cheat 2sg NEG 1sg deceive
 ‘I didn’t cheat you, you don’t deceive me.’

- b. 君亡之不恤，而群臣是忧，惠之至也。（左传，禧公十五年）
 [Jun wang], zhi bu xu, er [qun chen] shi you,
 ruler exile this NEG worry but group vassal this worry
 hui zhi zhi ye. (Xi Gong, Year 15)
 compassion GEN utmost ASS
 ‘The ruler is not concerned with his own banishment, yet is worried about his vassals; this is really the height of compassion.’

- c. 余虽与晋出入，余唯利是视。（左传，成公十三年）
 Yu sui yu jin churu, yu wei li shi shi. (Cheng Gong, Year 13)
 1sg although COM PN interact 1sg COP benefit this look at
 ‘Although I have dealings with Jin, I only consider benefit (to me).’

In this construction, the immediately preverbal NP is almost always a pronoun in the post-oracle bone texts (7th century BCE on). In (1a) we have the pronoun alone, but in (1b–c) the pronoun is resumptive, coreferential with the preceding referring expression. In both constructions the focus is narrow and contrastive. In the latter the event/thing to be focused on is first introduced then commented on using the pronoun and predicate, much like in the English construction *What do I want? You coming to work on time, THAT is what I want!* The narrow focus and contrastive nature can be seen clearly in the parallelism of (1a–b) and in the use of the copula *wei* in (1c), which is a narrow focus cleft structure with the sense of ‘only’ (Takashima 1990).

In the oracle bone inscriptions the construction is less restricted, allowing full NPs and preposition phrases to appear in immediate preverbal position when contrasted. The oracle bone inscriptions were divinations made as statements, often in sets, each one testing a particular course of action (Keightley 1978; Serruys 1981). We see the contrastive use of word order (but with focus position being immediately preverbal) in sets such as in (2) (Serruys 1981:334), which is a single series of propositions testing whether it is to Zu Ding or to some other spirit that the exorcism is to be performed, and it is clear that what is in focus is the one to perform the exorcism to:

- (2) 于祖丁，
 X³ yu Zu Ding,
 Perform.exorcism LOC Ancestor Ding

勿于祖丁年
wu yu zu Ding X.
do not LOC ancestor Ding perform.exorcism

于羌甲午，

yu Qiang Jia X
LOC Qiang Jia perform.exorcism

勿于羌甲午

wu yu Qiang Jia X
do not LOC Qiang Jia perform.exorcism

'Perform an exorcism to Ancestor Ding, don't perform an exorcism to Ancestor Ding, perform an exorcism to Qiang Jia, don't perform an exorcism to Qiang Jia.'

Yu (1980, 1981, 1987) gives examples to show that the so-called "inverted"⁴ clausal order of undergoer immediately before the verb is not limited to pronouns in negative and question constructions. He gives the function of this word order as "emphasizing" the undergoer, but as the constructions discussed here are narrow focus constructions (including question-word questions), this word order should be seen as putting it in the focus. Yu also argues that the deictic pronouns of Old Chinese, *shi* 是 ('*dje?') and *zhi* 之 ('*tj), are cognate with Tibetan *de* 'that' and *di* 'his' and that the word order exhibited by these pronouns in these sentences is the original Sino-Tibetan order. Wang Li (1980:356) also suggests that with pronouns the preverbal order may have been the original standard order, "as it is in French" but does not make the connection between this suggestion and the possibility that the order of pronouns may reflect an older general word order pattern, as it does in French.

What is significant about this pattern is that (a) it is used in most instances for interrogative pronouns and contrastive focus; (b) the pronoun in question appears immediately before the verb, the usual focus position of verb-final languages (cf. Comrie's discussion [1981:57, 1988] of focus position in Hungarian); and (c) it is a pattern that first was relatively free, involving lexical nouns and several different pronominal pronouns, then became more and more restricted (what Hopper 1991 refers to as "specialized"), then gradually disappeared over time from Chinese texts (see Yin 1985—in Modern Mandarin there are now only fossilized remnants, such as *hezai* 何在 [interrogative pronoun-locative verb] 'where?'). It would seem from the phenomena presented here that immediate preverbal position was the focus position in Old Chinese—at least in contrastive sentences—whereas Modern Mandarin has a very strong postverbal focus position (see LaPolla 1995, 2009; LaPolla and Poa 2005, 2006).

In terms of phrase-internal constituents, the order in Old Chinese is generally modifier-modified (ATTRIBUTE-HEAD, GENITIVE-HEAD, DEMONSTRATIVE-HEAD,

RELATIVE CLAUSE-HEAD, NEGATIVE-VERB), and also ADPOSITION-NOUN, NUMERAL-HEAD (or HEAD-NUMERAL-CLASSIFIER/MEASURE), ADJECTIVE-MARKER-STANDARD, though there are a number of examples of HEAD-ATTRIBUTE order (e.g. *sang rou* 桑柔 [mulberry-tender] 'tender mulberry') and NOUN-ADPOSITION order as well (Wang Li 1980; Dai 1981; Shen 1986).⁶

Sun (1991) discusses the history and distribution of the preposition phrases with *yi* 以. He shows that the adpositional phrase (AP) can occur before or after the verb, and that the adposition itself can be prepositional or postpositional, the only restriction being that the postpositional AP cannot appear postverbally. Sun suggests that based on this pattern, the postpositional, preverbal AP is the archaic order. Based on topic continuity counts of the type used in Givón (1983), he argues that the position of the prepositional AP before or after the verb is related to discourse-pragmatic factors—the preverbal type is more likely to be used in contrastive contexts. Interestingly, he found that when it occurred with the deictic pronoun *shi* 是 'that', *yi* ONLY appeared postpositionally. Again we see what seems to be a more conservative sentence pattern with pronouns.

As with the NP-NP-V clauses, the frequency of these marked word order patterns decreased over time and finally disappeared completely (though traces of these patterns can be seen in the fixed expressions *siwoyi* 所以 [pronoun-postposition] 'therefore', *heyi* 何以 [what-postposition] 'why, how', *shiyi* 是以 [pronoun-postposition] 'therefore').

Yu (1980, 1981, 1987) argues that the other examples of marked word order, such as noun-attribute (as in *sang rou* 'tender mulberry', *Qu Xia* 区夏 'Xia District') and noun-adposition order (he gives examples with *yu* 于, *zai* 在, and *yi* 以), are also remnants of the original Sino-Tibetan word order. Qin and Zhang (1985) argue that the early Chinese expressions of 'you + country name' (*You Shang* 有商 'Shang Country', *You Xia* 有夏 'Xia Country', etc.) should be seen as examples of noun-attribute order, with *you* meaning 'country'. They point out that noun-attribute order is not at all uncommon in the earliest Chinese, especially in names of places and people, such as in *Qiu Shang* 邱商 'Shang Hill', *Di Yao* 帝尧 'Emperor Yao', *Zu Yi* 祖乙 'Ancestor Yi'.

In Old Chinese all adverbial quantifiers generally appeared in preverbal position, as in (3a). In Modern Mandarin some quantifiers still appear in preverbal position, but more often those composed of a numeral and verbal classifier appear in postverbal position, as in (3b).

(3) a. 齐人三鼓。 (左传·庄公十年)

Qi ren san gu (ZuoZhuan: Zhuang Gong, Year 10)

PN person three drum

'The Qi army drummed three times'

b. 齐国军队敲了三次鼓。

Qiguo jundui qiao-le san-ci gu

PN army hit-PRV three-times drum

'The Qi army drummed three times'

As a verbal quantifier is generally used when the assertion is about the number of times one does something, it would follow that a change of focus position from immediate preverbal position to postverbal position would entail a corresponding change in the position of such quantifiers when they are focal.

In Modern Mandarin the order of elements in nominal quantifier phrases is always (except in listings/catalogues) 'number + measure/classifier + noun'. In Old Chinese, the order was 'noun + number + measure' (there were few classifiers) or 'number + noun'. Takashima (1985, 1987) gives a pragmatic explanation to the variation—the former is used when the number is focal and the latter when it is not. It is significant that the common order with measures (noun + number + measure) is the same as that of most Tibeto-Burman languages (see LaPolla 2002).

Chou (1961) and Dai (1981) both analyze all sentences in Old Chinese as topic-comment structures. Dai (1981) and Shen (1986) both state that alternate word order patterns exist for pragmatic reasons: to set off a particular element as either a topic or a comment. There are very few restrictions on alternate word orders; in fact some elements that cannot "topicalize" freely in Modern Mandarin do so regularly in Old Chinese. Just as in Modern Mandarin, in Old Chinese there are also "topic-comment within a topic-comment" structures (see LaPolla and Poa 2005, 2006 on this structure).

Relative clauses in the earliest Chinese (which, according to Chen 1956:133 and Gao 1987:283, is based on, and close to, the spoken language of the day—13th century BCE) do not have any overt relational marking; they are simply placed before the noun, with no additional marking (Serruy's 1981:356). This is a common pattern found in verb-final languages (cf. Greenberg 1966) and the only pattern reconstructable to Proto-Tibeto-Burman (see LaPolla 2002, 2008).

Aside from this, the position of certain clause particles at the end of the clause and the position of adverbs within the clause in Old Chinese is generally more similar to what we would expect from a verb-final language.

These are just a few of the facts that suggest that Old Chinese was very likely even more pragmatically based than Modern Mandarin and that there was a change in word order, from verb-final to verb-medial, at least partially related to a change in focus position but possibly also related to language contact, as in the case of Bai and Karen (see below, and LaPolla 2001).

3.3 TIBETO-BURMAN

Karen and Bai manifest the same pattern as in Old Chinese in terms of the major constituents: unmarked verb-medial order but NP-NP-V as a marked word order possibility. What is significant is that the conditions on the use of the marked word order pattern in Bai are almost exactly the same as those of Old Chinese: it is used when the second NP is a contrastive pronoun or when the sentence is negative or a question

(Xu and Zhao 1984). Also interesting about the use of the different word order patterns in Bai is the fact that the older people prefer the verb-final order, whereas the younger and more Sinicized people prefer the verb-medial order (Xu and Zhao 1984). This would seem to point to the change in word order as being relatively recent. Karen (e.g., Solnit 1997) has similar word order patterns, with genitives and nominal modifiers coming before the noun and number and classifier following the noun, while adjectival and verbal modifiers follow the verb. Karen does not appear to have a preverbal focus position; from the data in Solnit (1997), it seems that focus position is sentence-final as in Modern Mandarin. Karen possibly changed because of the influence of the surrounding Tai and Mon-Khmer languages. In terms of phrase-internal order, Karen is very similar to Old Chinese, differing mainly in terms of having HEAD-ATTRIBUTE order as the unmarked word order, as opposed to Old Chinese, which has it only as a marked order.

Karen and Bai differ from most of the rest of the Tibeto-Burman languages mainly in terms of the position of the NP representing the undergoer referent and in terms of having prepositions. At the phrasal level there is variety among the Tibeto-Burman languages, but there are clear dominant patterns. Table 3.1 lists the number of languages with the dominant pattern in the leftmost column, followed by that of the minority pattern and then the number of mixed languages. The last column is the total number of languages for which data was available on that particular category.

Among the languages with mixed patterns, from the use of the different patterns it was sometimes possible to determine which of the two possible orders was dominant or older within that language, and in most cases (all categories except for demonstrative and head order) the dominant order was the same as that in the leftmost column in Table 3.1.

Based on these numbers, plus the distribution and conditions on occurrence of the different phrase internal word order patterns, I believe the original order of these elements in Proto-Tibeto-Burman was DEMONSTRATIVE-HEAD, HEAD-ATTRIBUTE, RELATIVE CLAUSE-HEAD, HEAD-NUMBER, NEGATIVE-VERB, NOUN-ADPOSITION, GENITIVE-HEAD, STANDARD-(MARKER)-ADJECTIVE.

Table 3.1 Phrase patterns in Tibeto-Burman languages

| | | | | |
|-----------------|----------------|---------------|------------|------------|
| dem-h (60) | h-dem (29) | dem-h-dem (7) | mixed (17) | total: 113 |
| h-att (66) | att-h (25) | | mixed (31) | total: 122 |
| rel-h (65) | h-rel (7) | | mixed (10) | total: 82 |
| h-num (97) | num-h (14) | | mixed (14) | total: 125 |
| neg-v (69) | v-neg (39) | | mixed (12) | total: 120 |
| gen-h (121) | h-gen (0) | | mixed (0) | total: 121 |
| st-(m)-att (74) | att-(m)-st (0) | | mixed (0) | total: 74 |

Note: att = attribute, dem = demonstrative, gen = genitive, h = head, m = marker (in comparative), neg = negation, num = numeral, rel = relative clause, st = standard (in comparative), v = verb.

These may also have been the dominant orders in Proto-Sino-Tibetan as well. The most controversial of these orders is DEMONSTRATIVE-HEAD, as it would seem from some factors that the opposite order is more archaic (e.g., the oldest written language, Tibetan, has HEAD-DEMONSTRATIVE order), and it is my own gut feeling that HEAD-DEMONSTRATIVE is the older order, yet given the numbers presented in Table 3.1, and the fact that the other old written languages (Burmese, Newari, Tangut) in Tibeto-Burman and also Old Chinese all have DEMONSTRATIVE-HEAD order, I am forced to conclude that this is the older order.

In terms of position of auxiliaries, the dominant pattern in Tibeto-Burman is for the auxiliary verbs to follow the main verb, though there are a number of languages that have the opposite order, as in Sinitic and Karen. Change of auxiliary position from postverbal to preverbal can come about from serial, clause chaining constructions (see Young and Givón 1990 for an example of this in Chibchan [Panama/Costa Rica]), such as are common in Sino-Tibetan languages.

Most important to supporting my hypothesis is that the development of a postverbal or sentence-final, focus position motivated the change to verb medial order are examples in which NPs in otherwise solidly verb final languages appear in postverbal (clause-final) position for emphasis of their status as focal constituents, as in the following Tamang examples (from Taylor 1973:100–101).⁷

- (4) a. asu-ce m yampu-m 'khana 'khana kor-jeh- ci tinyi syoo-ri.
 Actor Location Location Event Time
 'Where did you go for a stroll around Kathmandu this morning, Asu?'
 b. 'dehre-no chyaa-la 'henyi-'maah-ta-m.
 Time State Site
 'Now they will receive (the money).'
 c. ta-ci kon 'dehre bis-bahrsa.
 Event Vocative Time Undergoer
 'Now twenty years have passed, Kon.'
 d. Tup-'maah them-pala 'Tim chyau-'maak-ri.
 Undergoer State Site
 'The threads were placed in the sides (of the loom).'
 e. 'icu-'maah-ri 'raa-pi 'phinyi-ka cung-pala yaa-ce hoi.
 Site Undergoer State Instrument
 'Here (in these places) the weaving comb is caught by the hand.'

- f. ken ca-ci the-ce-no.
 Undergoer Event Actor
 'It was indeed he who ate the rice.'

This is a narrow focus construction, the flip side of the one we saw in Old Chinese, as the unmarked focus position is preverbal in Tamang.

3.4 CONCLUSIONS

It has been shown in languages outside Tibeto-Burman that even in otherwise verb-final languages there is a tendency for at least some types of focus to appear postverbally (see for example Herring and Paolillo 1995). This has been used as an argument for a universal sentence final focus position (e.g., Hetzron 1975). Whether or not sentence final focus is universal, we have seen evidence in Tamang of this type of pattern, and it may exist in many other languages within Tibeto-Burman as well. If in Proto-Sinitic postverbal focus was one possibility, and this originally marked pattern came to be so frequent that it became the unmarked pattern, then it would cause a change in the unmarked position of the undergoer, as the NP representing the undergoer is most often in focus position cross-linguistically.

As postverbal focus in verb-final languages is generally a discourse phenomenon (i.e., does not show up in canonical sentences), the rareness of this construction in the literature may simply be because it does not turn up in the usual elicited data on which most of the sources on Tibeto-Burman languages are based, or is only used for particular rare types of marked focus, as in Tamang. This is again one reason when doing fieldwork we should always record a large amount of naturally occurring text, rather than simply sentences.

Given all the facts discussed here, there is a strong case for the view, originally proposed by Terrien de Lacouperie (1887, chapter 1) and Wolfenden (1929:6–9), that Proto-Sino-Tibetan word order was verb-final and that it was Sinitic, and not Tibeto-Burman, that was the innovator in terms of word order, and it is very likely this change came about at least partially because of a change in the unmarked focus position.

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NOTES

1. The earliest Chinese writing dates to the 13th century BC (Keightley 1978); the earliest Tibeto-Burman writing (Old Tibetan) dates to the seventh century CE (Jäschke 1954). The time depth of the breakup of Sino-Tibetan is about 6,000 years (Wang 1998), roughly the same as Indo-European (Nichols 1992).
2. Abbreviations used in the examples: 1 first person, 2 second person, 3 third person, ASS assertive, COM comitative, COP copula, GEN genitive, LOC locative, NEG negative, PN proper name, PFV perfective, sg singular.
3. Serruy's (1981) does not give a pronunciation for this character, and it is not used in Modern Mandarin, so I have represented the pronunciation with "X."
4. As Wang Li argues (1980:366), this name implies it is a marked order. It is in fact the unmarked order for pronouns.
5. Coblin (1986:149) lists Chinese *shì* 是 ('dji(?) 'this' and *shì* 是 'this, that' with Tibetan 'di and *de* but does not include *zhi*, while Yu (1981:83) equates *shì* 是 with *zhi*. (The reconstructed forms are from Baxter 1992.) Yu (1987:39) also equates the Old Chinese copula *wei* 唯 / 唯 ('wiji) with the Modern Tibetan copula *red*, but in this I think he is mistaken, as *red* does not appear in Old Tibetan texts, so is a late development.
6. All of the Old Chinese adpositions are in some contexts predicative, and so this order is really just a subtype of verb-final word order.
7. This article is in the Tagmemics framework (see Hale 1973); word-for-word glosses are not given; only the roles are given. The focal element is underlined.

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CHAPTER 4

PROTO-SINO-TIBETAN
MORPHOLOGY AND
ITS MODERN CHINESE
CORRELATES

TSU-LIN MEI

4.1 THE VOICING ALTERNATION AND THE
CAUSATIVE *S- PREFIX IN OLD CHINESE

In Old Chinese (OC) and Middle Chinese, there are alternations of consonants in which the voiced member is the intransitive verb and the voiceless member is the transitive verb. The “intransitive/transitive” opposition is also called “noncausative/causative” or “simplex/causative” opposition.

| | | | |
|----|-----|---|---|
| 1. | 败 | *brads>bwai *prads>pwai | ‘ruined, defeated’ ‘to ruin, to defeat’ |
| 2. | 别 | *briat>bjat *prijat>pjat | ‘to be different, to leave’ ‘to divide, to separate’ |
| 3. | 断 | *duanx>duan *tuans>tuan | ‘severed’ ‘to cut off’ |
| 4. | 折 | *djat>zjat *tjat>tšjat | ‘broken (of sticks, branches)’ ‘to break, to bend’ |
| 5. | 属 | *djuks>zjwoks *tjuks>tšjwoks | ‘conjoined, connected’ ‘to connect, to join’ |
| 6. | 长短解 | *driangx>driang *gringx>yai *kringx>kai | ‘grow tall, increase’ ‘to crack, break open (vi), loosened’ ‘to cut up (an ox)’ |

| | | | |
|-----|--------|----------------------------|---|
| 8. | 现 見 | *gians>yien *kians>kien | ‘to appear’ ‘to see’ |
| 9. | 繫 | *gigs>yiei *kigs>kiei | ‘linked, joined’ ‘to tie’ |
| 10. | 会 | *gwads>yuai *kwads>kuai | ‘united, conjoined’ ‘to combine, to aggregate (the account)’ |

How did these voicing alternations arise? The answer comes in two parts. First, Old Chinese, like other Sino-Tibetan languages, had a causative *s- prefix. Second, the voiced/voiceless pairs were generated by the *s- causative, thus:

| | | | |
|----|---|---------------------------------------|--------------------------------|
| 1. | 败 | OC *brads>MC bwai | ‘ruined, defeated’ |
| | | OC *s-brads>*s-prads>*prads>MC pwai | ‘to ruin, to defeat’ |
| 2. | 别 | OC *briat>MC pjat | ‘to be different, to leave’ |
| | | OC *s-briat>*s-prijat>*prijat>MC pjat | ‘to divide, to separate’ |
| 4. | 折 | OC *djat>MC tʃjat | ‘broken (of sticks, branches)’ |
| | | OC *s-djat>*s-tʃjat>*tʃjat>MC tʃjat | ‘to break, to bend’ |
| 8. | 现 | OC *gians>yien | ‘to appear’ |
| | 見 | OC *s-gians>*s-kians>*kians>MC kien | ‘to see’ |

That is, the morphological function of the *s- causative is to form causatives; in other words, “to defeat X” is “to cause X to be defeated” or “to cause defeat in X” and “to break a stick” is “to cause a stick to be broken” and so on. Its phonetic effect is to devoice the immediately following voiced stop. Let b- represent voiced stops and p- voiceless stops; then the devoicing effect of s- may be stated as follows:

(SDS) s- devoicing for stops: s-b>s-p>

s- is lost after devoicing the immediately following voiced stop.

In what follows I cite, from *Han-Zangyu Gaifan* (An Introduction to Sino-Tibetan Languages, Ma 2003) and *The Sino-Tibetan Languages* (Thurgood and LaPolla 2003), two types of evidence from Tibeto-Burman languages to support the previous analysis.

(1) The causative s- prefix in Tibeto-Burman languages.
Classical Tibetan has the causative s- prefix as well as the voiced/voiceless (aspirated) alternation in noncausative/causative verbs. In some Tibeto-Burman languages the s- prefix acquired an epenthetic vowel and became a syllabic causative prefix (e.g., Dulong sš, Jinghpaw ja- ~ ʃa-, Cogtse Gyarong sa-). In the following I cite Dulong examples from LaPolla (2003), supplemented with examples from Ma (2003:317–319).

(2) Examples of voiced/voiceless alternation in Classical Tibetan, Liang-shan Lolo, and Lahu. The expert authors of these articles all say the voiceless initial consonant of the causative is due to the devoicing effect of s-.

(3) Gong Hwang-chenrg’s Sino-Tibeto-Burman cognates of the causative pair 别/*briat ‘different, to leave’/别/*prijat ‘to divide, to separate’ (Gong 2002:187).

4.1.1 Dulong

In Dulong intransitive verbs can be made transitive or causative by the addition of the causative prefix *sǎ*, for example:

| | | | |
|--------|----------------------|--------|--------------------------|
| Dulong | | | |
| ip | 'to sleep' | sǎ-ip | 'to cause to sleep' |
| dam | 'full' | sǎ-dam | 'to fill' |
| tat | 'thick' | sǎ-tat | 'to thicken' |
| min | 'ripe' | sǎ-min | 'to make something ripe' |
| dat | 'broken (of string)' | sǎ-dat | 'to break (of string)' |

See LaPolla (2003:677).

4.1.2 Written Tibetan

There are two ways to form the causative in Written Tibetan (Ma 2003:138–139). One is to prefix *s-* to the base of the verb; the other is by way of the voiced/voiceless alternation in the initials of noncausative/causative verbs.

| | | | | |
|----------|-------------|---|---------------|----------------------------------|
| WT | | Noncausative | | Causative |
| s + verb | lanj | 'to rise' | s-lanj | 'to cause to rise' |
| | log | 'to return' | s-log | 'to cause to return' |
| | nyal | 'to lie down; to sleep' | s-nyal | 'to lay down; to bed a person' |
| | nub | 'to sink; to decline' | s-nub | 'to cause to perish; to destroy' |
| vcd/vcl | bye | 'to open by itself' | phye | 'to cause to open' |
| | bud | 'to come out; e.g., 'my tooth came out' | phud | 'to pull out' |
| | bral | 'to get separated' | phral | 'to cause to separate' |
| | dul | 'soft, tame, gentle' | thul | 'to tame, to conquer' |
| | gum | 'to die' | khum | 'to kill' |
| | grol | 'loose; to become untied' | khrol | 'to release, to untie' |

For bases with lateral or nasal initials, the causative is formed by prefixing *s-* to the base. For bases with voiced-stop initials, *s-* is seldom present in the causative. Instead we have alternations of voiced (**b d g**) and voiceless aspirated (**ph th kh**) consonants. It is not hard to deduce that *s-* was present but disappeared after devoicing the immediately following voiced stop, thus:

s-b>s-p>p>ph
s-d>s-t>t>th
s-g>s-k>k>kh

The last step follows Li's Law for Written Tibetan (WT), discovered by Li Fang-Kuei in 1933, which says voiceless unaspirated stops in absolute position change to voiceless aspirated stops. The rest is the *s-* devoicing rule for stops, first formulated by Betty Shells Chang (1971:685).

4.1.3 Yi or Liang-shan Lolo

In Yi or Liangshan Lolo (Ma 2003:431), causative pairs have voiced initial in the non-causative and voiceless initial in the causative; for example,

| | | | |
|------------|-------------------|-------------|------------------------------------|
| Yi (Lolo) | | | |
| | Noncausative | Causative | |
| gu | 'to hear' | ku | 'to cause someone to hear' |
| ga | 'to wear clothes' | ka | 'to cause someone to wear clothes' |
| bi | 'to come out' | pi | 'to cause to come out' |
| dzu | 'to eat' | tʂa | 'to feed' |
| ge | 'to break' | khe | 'to cause to break' |
| dʒo | 'to collapse' | teho | 'to cause to collapse' |

Commenting on pairs such as *gu* 'to hear' / *ku* 'to cause someone to hear', Betty Shells Chang and Kun Chang (1976:477) said, "Other causative pairs have a simple voiced-stop initial in the non-causative of both Tibetan and Liang-shan Lolo, which appears to have been devoiced by **s-* in the causative."

4.1.4 "Lahu"

The oldest way of forming causative verbs in the Tibeto-Burman family is by an **s-* prefix. Although this prefix has long since disappeared from the Loloish languages, its effects survive in over a dozen Lahu verbs of causative meaning that differ only in tone and/or initial consonant from a corresponding noncausative verb:

| | | | |
|------------|-------------------|-----------|-----------------------------|
| dà | 'to drink' | tə | 'to give to drink' |
| mə | 'to see' | mɔ | 'to show' |
| cá | 'to eat' | cā | 'to feed someone' |
| vā | 'to be far' | fi | 'to separate; to demarcate' |
| và? | 'to hide oneself' | fá | 'to hide something' |
| tò? | 'to be burning' | tú | 'to kindle; to set on fire' |

See Matitsoff (2003:219).

4.1.5 Tibeto-Burman Cognates

Gong Hwang-cherng (2002:187–188) proposed the following Tibeto-Burman cognates for the Chinese causative pair 别**brjat*/别**prjat*.

| | | | |
|----|---|--|---|
| OC | 别 | * <i>brjat</i> > <i>bjät</i> | 'to be different, to leave' |
| | | * <i>prjat</i> > <i>pjät</i> | 'to divide, to separate' |
| WT | 裂 | * <i>rjat</i> >* <i>tjat</i> > <i>tjät</i> | 'to tear asunder, to divide' |
| | | N-brad, pf. brad | 'to scratch, to lacerate by scratching' |
| | | sbrad | 'to scratch' |
| WB | | prat | 'to be cut in two; to be cut off' |
| | | phrat | 'to cut in two; to break off' |

In sum, according to the this analysis, the Old Chinese voiced/voiceless alternation should be described, in terms of its origin, as the result of voiced-stop devoicing by the causative *s-. A further consequence of this analysis is that the causative *s- and the voiced/voiceless alternation should not be regarded as two distinct morphological processes, but rather the latter should be seen as a reflex of the former.

4.2 THE NOMINALIZING AND PERFECTIVE -S SUFFIX

4.2.1 The Nominalizing -s Suffix

Shen Yue 沈约 (441–513) was the first to talk about the four tones, and he gave them the names ping 'even', shang 'rising', qu 'departing', and ru 'entering'. Half a century later, Lu Deming 陆德明 made a large collection of glosses to the Classics in his *Jingdian Shiwen* 经典释文 (583–589), and these glosses contained instances of a morphological process known in Chinese as *si sheng bie yi* 四声别义 'differentiate meaning by means of tones' and in English as "derivation by tone change" (Downer 1959). Some examples are:

| | | | | |
|------------------------------|-----------------------------------|---------------|---------------------------------|---------------------------------------|
| MC>Mandarin (Modern Chinese) | | | | |
| 量 | <i>liang</i> (ping)> <i>liàng</i> | 'to measure' | <i>liang</i> (qu)> <i>liàng</i> | 'a measure' |
| 数 | <i>shu</i> (shang)> <i>shù</i> | 'to count' | <i>shu</i> (qu)> <i>shù</i> | 'a number' |
| 传 | <i>chuan</i> (ping)> <i>chuán</i> | 'to transmit' | <i>chuan</i> (qu)> <i>chuán</i> | 'what has been transmitted, a record' |
| 织 | <i>zhi</i> (ru)> <i>zhī</i> | 'to weave' | <i>zhi</i> (qu)> <i>zhī</i> | 'woven stuff' |

On the left all lexical items are verbs, and they are all in nondeparting tone in Middle Chinese, that is, in even, rising, or entering tone. On the right all lexical items are nouns, and they are all in departing tone. Thus the morphological process "qusheng derivation" has the ability to derive a noun from a verb, whereas the derived noun is the patient of the action presented by the verb.

The 1950s and 1960s witnessed the rise of Haudricourt (1954) and Pulleyblank's (1963) theory of tonogenesis for Old Chinese. The theory holds that Chinese was originally a nontonal language and that pitch and contour tones arose in Late Old Chinese through the loss of certain types of final consonant. In particular, the rising tone of Old Chinese came about through the loss of an earlier glottal stop *-ʔ, and the departing tone of Old Chinese came from an earlier *-s suffix. While the *-ʔ theory for the rising tone is still in dispute, the *-s theory for the departing tone has won general acceptance, with the consequence that departing tone words in contact with entering tone words in phonetic series can now be written as *-ps, *-ts, *-ks in Old Chinese, instead of *-bh, *-dh, *-gh as in Li Fang-Kuei's (1983) system. At the same time, we retain Li's convention of using the letter -x to indicate *shangsheng*: no special letters are required to indicate *pingsheng* and *rusheng*.

We are now ready to present the data for the nominalizing *-s suffix in Old Chinese (Mei 1980).

(1a) There are cognate pairs in Old Chinese in which the verb is in entering tone and the derived noun is in departing tone, here reconstructed as *-s in Old Chinese as explained earlier.

| | | | | | |
|---|-------------------------------|------------------------|---|---|----------------------|
| 纳 | * <i>nep</i> > <i>nâp</i> | 'to bring in' | 内 | * <i>neps</i> >* <i>nat</i> > <i>nuai</i> | 'inside' |
| 立 | * <i>gwrjap</i> > <i>ljap</i> | 'to stand' | 位 | * <i>N-gwrjaps</i> > <i>yjwi</i> | 'place of rank' |
| 织 | * <i>tjak</i> > <i>tsjak</i> | 'to weave' | 织 | * <i>tjaks</i> > <i>tsi</i> | 'woven stuff' |
| 责 | * <i>tsrik</i> > <i>tssek</i> | 'to demand payment' | 债 | * <i>tsriks</i> > <i>tsai</i> | 'debt' |
| 塞 | * <i>sak</i> > <i>sək</i> | 'to stop up, to block' | 塞 | * <i>saks</i> > <i>sai</i> | 'a pass, strait' |
| 度 | * <i>dak</i> > <i>dək</i> | 'to measure' | 度 | * <i>daks</i> > <i>duo</i> | 'a measure' |
| 结 | * <i>kit</i> > <i>kiet</i> | 'to tie, to knot' | 髻 | * <i>kits</i> > <i>kiei</i> | 'hair-knot, chignon' |
| 列 | * <i>rjat</i> > <i>ljat</i> | 'to rank, to order' | 例 | * <i>rjats</i> > <i>ljai</i> | 'usage, rule' |

(1b) There are cognate pairs in Old Chinese in which the verb is either in even tone or in rising tone and the derived noun is in departing tone.

| | | | | | |
|---|---------------------------------|---------------------|---|---------------------------------|----------------|
| 量 | * <i>grjang</i> > <i>ljang</i> | 'to measure' | 量 | * <i>grjangs</i> > <i>ljang</i> | 'a measure' |
| 藏 | * <i>dzang</i> > <i>dzang</i> | 'to hide, to store' | 藏 | * <i>dzangs</i> > <i>dzang</i> | 'storehouse' |
| 捲 | * <i>kwjianx</i> > <i>kwjan</i> | 'to roll' | 卷 | * <i>kwjians</i> > <i>kwjan</i> | 'a roll' |
| 传 | * <i>drjuan</i> > <i>djwan</i> | 'to transmit' | 传 | * <i>drjuans</i> > <i>djwan</i> | 'a record' |
| 阵 | * <i>drjin</i> > <i>djen</i> | 'to display' | 阵 | * <i>drjins</i> > <i>djen</i> | 'battle array' |
| 数 | * <i>sriugs</i> > <i>sju</i> | 'to count' | 数 | * <i>sriugs</i> > <i>sju</i> | 'a number' |

(2) Two Old Chinese verb/noun pairs have Written Tibetan verb/noun pairs as their cognates.

| | OC | | WT | |
|---|------------------------|---------------|--------|----------------|
| 量 | *grjang>*rjang>ljang | 'to count' | grang | 'to count' |
| | *grjangs>*rjangs>ljang | 'a measure' | grangs | 'a number' |
| 织 | *tjaks>šjak | 'to weave' | thag | 'to weave' |
| | *tjaks>tsi | 'woven stuff' | thaggs | 'texture, web' |

(3) Standard grammars of Written Tibetan (also known as Classical Tibetan) state that Written Tibetan has a nominalizing -s suffix. For example, Stephan Beyer's *The Classical Tibetan Language* (1992) says the following about "The Formative -s 'Nominal'".

The nonsyllabic formative -s "NOMINAL" is found in nouns derived from verbs—for example, SKYAB "protect" skyabs "protection," SKYEM "be thirsty" skyems "beverage, beer, libation," KHRU "bathe" khrus "bath," GRANG "count" grangs "number," NGRO "go" ngros "motion, travel," LTA "look" las "omen, sign, prodigy," NDOM "come together" ndoms "genitals," SPU "decorate" spus "beauty," SPO "change, shift" spos "incense," SBUG "pierce" sbugs "hole," RTSI "count, calculate" rtsis "counting, numeration, astrology," ZA "eat" zas "food," ZAB "be deep" zabs "depth," LOG "return, turn around" logs "side, direction, region," SRUB "stir, rake, rub" srubs "cleft, slit, rent, wound," SLOB "learn, teach" slobgs "exercise, practice, experience." (118)

This shows that the nominalizing *-s suffix is a morphological process Proto-Chinese inherited from Proto-Sino-Tibetan. In other words, at one time in the distant past, if a speaker of Proto-Chinese wanted to change a verb into a noun, all he or she needed to do was to add the -s suffix to the verb. When *-s became the departing tone in Late Old Chinese, the morphological process "qusheng derivation" came into being, replacing the now defunct -s suffix.

This survey also shows that the nominalizing *-s suffix was a morphological process with remarkable longevity. In its first incarnation as the *-s suffix, the morphological process flourished for roughly 6,000 years, from Proto-Chinese (6000 BCE) to Late Old Chinese (100 CE), and in its second incarnation as "qusheng derivation" lived on for another millennium. Obviously, the theory of tonogenesis played a large role in our account. The theory brings together "qusheng derivation" in Chinese and the nominalizing -s suffix in Written Tibetan and shows that the nominalizing *-s is the common heritage of both Chinese and Tibetan.

4.2.2 The Perfective and Nominalizing -s Suffix

The results obtained so far can be extended. We have been discussing the nominalizing -s suffix in Written Tibetan and in Old Chinese. But the -s suffix has two other functions in Written Tibetan; it occurs in verbs as a perfect suffix and in some present perfect forms. The question naturally arises as to whether there is any connection between the perfective -s and the nominalizer -s.

Wolffenden (1929:58) was the first to suggest an affirmative answer in his pioneering *Outline of Tibeto-Burman Linguistic Morphology*. He said, "As a consequence of coming to indicate action as completed, -s and -d caused many derivatives to settle out of verbs in later times, crystallizing into adjectival and substantival meaning." He then gave the following examples of "derivatives from perfectives in -s".

From roots originally ending in a vowel we have:

blus-ma substantive, 'ransom' (cf. **blud-pa**, 53). Perfect of **blu-ba**; **blus** perfective, 'to buy off, to ransom'.

las substantive, 'miraculous sign or manifestation, omen, miracle'; Perfect of **la-ba**; **blas** perfective; **los** imperative; **blta** 'to look at, to view'

rtis substantive, 'counting, numeration; account; estimation, esteem'; Perfect of **rtsi-ba**; **rtis** perfective; **brtsi** future; (b) **rtsi(s)** imperative, 'to count, to reckon'.

From roots originally ending in -n

zas substantive, 'food'; from the perfect of **za-ba**; **bzas** perfective; **zos** 'to eat'

It should be noted that Wolffenden was talking about the same verb/derived-noun pairs discussed by Stephan Beyer (1992) in the passage cited earlier, for example, LTA 'look' las 'omen, sign, prodigy', RTSI 'count, calculate' rtis 'counting, numeration, astrology'; ZA 'eat' zas 'food'. The difference between the two consists of the fact that Wolffenden interpolated the perfect of the verb—**blas**, (b) **rtis**, **bzas**—between the verb and the derived noun and showed that the derived noun came from the perfect of the verb.

As Written Tibetan is a guide for the study of Old Chinese morphology, we should ask two questions. First, in **qusheng** derivation, are there instances of alternation between verb in nondeparting tone and perfect of verb in departing tone? Second, in **qusheng** derivation, are there instances of derived noun originating from the perfective? In what follows, we use the pair **zhāng** 张 'to stretch, extend' / **zhāng** 张(胀) 'to be swollen, distended' to answer the first question and the pairs **zhī** 织 'to weave' / **zhī** 织 'woven stuff' and **chuán** 传 'to transmit' / **chuán** 传 'what has been transmitted, a record' to answer the second.

(1) 张 *trjang 'to stretch, extend'; 张(胀) *trjangs 'to be distended, swollen, bloated'

Zuozhuan 左传 Cheng year 10 将食, 张, 如厕, 陷而卒 Jiāng shí, zhāng, rú cè, xiān ér zú "He was about to eat, felt his belly distended, went to stool, fell into the latrine and died." Commentators say 张 zhāng should be read in the departing tone, later written as 胀 zhàng 'swollen, distended' and it means 脐 mǎn 腹满 'belly full, belly distended'. Clearly, 胀 *trjangs 'distended, swollen' is the perfect of the verb 张 *trjang 'to stretch, to extend'.

- (2) 织 *tʃak > tʃjak 'to weave'; *tʃjaks 'woven stuff, thing woven'
 WT verb "thag, btags future; btags perfect; thag imperative 'to weave, to grind'; thags
 substantive, 'texture, web'

In Written Tibetan the perfect of the verb, btags, and the substantive, thags, share the -s suffix. We can then follow Wolfenden's footsteps and say that -s caused derivatives such as btags to settle out of verbs in later times, crystallizing into substantial meaning, namely, thags 'texture, web'. By the same token, Old Chinese 织 *tʃjaks is the perfect of the verb ("woven"), which eventually evolves into the derived noun "woven stuff".

- (3) 传 *chuán* *drjuan 'transmit'; 传 *zhuán* *drjuans 'what has been transmitted, a record'

Zuozhuan is literally 'what has been transmitted according to Zuo Qiuming' or *Zuo's Record*. In English, "transmitted" is the past and perfect of "transmit" just as Old Chinese *drjuans 'transmitted' is the perfect of *drjuan 'transmit'. "The transmitted (= record)" 传 *drjuans is the noun derived from the perfect of the verb *drjuan 'to transmit'.

This brief survey is intended to show that there are at most a handful of instances like (1) and dozens of instances like (2) and (3). The general conclusion is that the perfective -s suffix was present in Old Chinese just as it was present in Classical Tibetan and other Tibeto-Burman languages.

4.3 CONCLUSION

Alternation of voiced and voiceless consonants and derivation by tone change are two morphological processes well known to Qing philologists, but it was European linguists such as Conrady (1896) and Karlgren (1949) who first understood their true significance. With the rise of Sino-Tibetan comparative linguistics in the second half of the 20th century we now know that the voicing alternation goes back to the causative *s- prefix in Proto-Sino-Tibetan and the qusheng derivation to PST nominalizing (and perfective) *-s suffix. Along the way we answered two questions puzzling to early students of Asian languages: (a) How can an isolating language like Chinese be genetically related to Classical Tibetan, a language richly endowed with morphology? and (b) How can a tonal language like Chinese be related to Classical Tibetan, apparently devoid of pitch and contour tones? In sum, the analysis presented here is a 21st-century version of the history of Conrady (1896) and Haudricourt (1954).

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CHAPTER 5

OLD CHINESE
PHONOLOGY

ZEV HANDEL

5.1 INTRODUCTION

WHAT did Chinese sound like 3,000 years ago? Written Chinese texts survive from as far back as the 13th century BCE, the time of the earliest “oracle bones” of the Shang 商 royal court. While the textual record provides relatively direct evidence of early Chinese vocabulary and syntax, the nature of the nonalphabetic Chinese writing system obscures the tremendous changes in pronunciation that have occurred over the last three millennia. Modern attempts to crack the puzzle of Old Chinese (OC) pronunciation begin with the work of the great Swedish sinologist Bernhard Karlgren in the first half of the 20th century, who was the first scholar to apply the tools of Western linguistic science to the primary sources of evidence for OC pronunciation. Over the rest of the 20th century, scholars made a series of methodological breakthroughs, bringing new evidence, new insights, and new theoretical tools to bear on the problem. The past two decades have been particularly exciting for the field, leading to a radically different understanding of the structure of OC phonology. These insights have revolutionized our understanding of the etymological connections underpinning the development of the early Chinese vocabulary and are already transforming the interpretation of ancient Chinese literature and the analysis of ancient manuscripts.

This chapter describes the basic sources and methodology for the reconstruction of OC phonology, the history of the field through the 20th century, and the most recent developments. It summarizes current hypotheses and discusses the implications they have for future work on the early history of the Chinese language.

5.2 THE VALUE OF OLD CHINESE
RECONSTRUCTION

For linguists, no justification is needed for reconstructing the pronunciation of Chinese as spoken 2,500 to 3,000 years ago. The resurrection of words and sounds not heard in millennia, linguistic echoes of an ancient culture, is in itself an exciting and intellectually stimulating endeavor. But there are additional reasons why an accurate reconstruction of ancient Chinese pronunciation is of value not just to linguists but also to literary scholars, historians, anthropologists, archeologists, and others with an interest in the world of ancient East Asia.

Knowledge of ancient Chinese pronunciation can aid specialists with the interpretation and appreciation of literary, historical, and other texts of ancient China. It can illuminate cultural interactions with non-Chinese people speaking other languages. And it can reveal important clues about the historical origins of the Chinese language. These considerations, and others, continue to motivate scholars working to improve our reconstructions of OC.

5.3 HISTORICAL LINGUISTICS
AND OLD CHINESE RECONSTRUCTION

There are three basic techniques that historical linguists of the modern era employ to reconstruct the pronunciation of ancient languages. The first is the comparative method, a systematic process for analyzing related languages in order to reconstruct the vocabulary and pronunciation of their ancestral tongue. The second, internal reconstruction, systematically analyzes patterns of alternation within a language in order to reconstruct earlier forms of roots and affixes. The third is textual analysis, which involves making use of contemporaneous written documents to reveal features of the language reflected in those documents.

Ideally, sufficient evidence is available to make use of all three methods simultaneously; taken together, they enable us to draw a substantial picture of the ancient spoken language. To take a well-known example, consider the reconstruction of Latin, the language of Rome and its environs in the first millennium BCE and of the later Roman Republic and Empire. Application of the comparative method to the various Romance languages that are descended from Latin, such as Spanish, French, Italian, and Romanian, yields the vocabulary and pronunciation of their ancestor. Through internal reconstruction, variations of verb and noun roots found within conjugated and declined forms of Latin are compared in order to determine the older forms of these roots. Analysis of the very large corpus of Latin texts gives us a separate window into many

aspects of the language. These three techniques are complementary; the comparative method and internal reconstruction reveal aspects of spoken vocabulary and pronunciation that predate written records or were never preserved in writing. Textual analysis yields information that is not recoverable through the other two methods.

When it comes to the reconstruction of OC, the techniques that linguists have applied are somewhat idiosyncratic when compared to work carried out on other languages. This is due in part to the special nature of the Chinese writing system and in part to historical accidents that shaped the field of Chinese historical linguistics in the 20th century. Even now, new data that bears on ancient Chinese is still coming to light, and new techniques are being developed for, or adapted to, the reconstruction project. In order to grasp the achievements and remaining challenges of OC reconstruction, we must survey the history of the modern field, its methodological underpinnings, and its current trends.

Throughout the 20th century, efforts to reconstruct the pronunciation of OC have rested primarily on textual analysis. In recent decades, internal reconstruction has played an increasingly important role. The comparative method has, so far, been minimally employed, but there are indications that it may be possible to make better use of this method in the future.

5.4 BERNHARD KARLGRÉN AND THE ORIGINS OF THE MODERN FIELD

The renowned Swedish sinologist Bernhard Karlgren (1889–1978) is rightly viewed as the father of historical Chinese linguistics. He pioneered the methods used to reconstruct both Middle Chinese (MC) and OC (which he termed *Ancient Chinese* and *Archaic Chinese*, respectively) and provided the first complete reconstructed lexicons for both languages. His influence, both inside and outside China, cannot be overstated, and it remains an important presence even as newer developments increasingly depart from the Karlgrenian model. Karlgren's work on OC began in the 1920s; after a number of revisions published in ensuing decades, his final version was explicated in Karlgren (1954) and presented in dictionary form in Karlgren (1957), which remains a widely cited reference work today.

Karlgren (1954:212) defined OC as “the language of the Honan [=Henan] region during the first Chou [=Zhou 周] centuries (from 1028 B.C.)”. Some contemporary scholars adopt a similarly narrow definition of OC as the language of the early and mid-Zhou dynasty; for others, the OC period extends from the time of the earliest Chinese texts (the oracle bone inscriptions of the 13th century BCE) through the late Han dynasty (2nd century CE). While the precise definition of the OC period varies, all scholars agree that the heart of the period coincides with the two major sources of textual evidence: the *Shijing* 诗经 “Book of Odes,” whose 305 poems are thought to date to the 8th through the

5th centuries BCE, and the sound-bearing structural elements of Chinese characters dating to roughly the same period.

Karlgren's approach was built on the work of Chinese philologists that preceded him, as well as that of several pioneering Western linguists like the German sinologist Walter Simon and the French sinologist Henri Maspero. The native Chinese philological tradition had long recognized that rhyming patterns of the OC period differed significantly from those of the later medieval period. The Ming dynasty philologist Chen Di 陈第, in his work *Maoshi Guyin Kao* 毛诗古音考 “Investigation of Ancient Pronunciation in the Mao Odes,” famously argued that these discrepancies were due to sound change over time rather than divergent poetic practices. Throughout the Ming and Qing periods, Chinese philologists analyzed *Shijing* rhyming patterns with increasing sophistication. (For a brief overview, see Baxter 1992, chapter 4.) But they lacked the conceptual framework that would have allowed them to posit reconstructed sound values. Providing those values was Karlgren's key achievement.

Just as the Qing scholars had done, Karlgren made an analysis of *Shijing* rhyming patterns, determining how many distinct classes of rhyming syllables existed in the OC language and assigning specific words—written with specific characters—to those classes. For example, *dié* 垤 ‘ant-hill’ and *shì* 室 ‘chamber’ were assigned to the class he designated “Group 10” because they rhyme with each other in the following lines from the ode titled *Dongshan* (东山) (1950:102, 1954:307):

鸛鳴于垤 / 婦歎于室 the heron cries on the ant-hill; the wife sighs in the chamber;
洒掃穹室 / 我征聿至 she sprinkles and sweeps, and the holes (in the walls) are
stopped up; we march and arrive

It has long been known that the vast majority of Chinese characters are composed of two elements, one of which serves a phonetic role. In the 18th century the Chinese philologist Duan Yucai 段玉裁, in his masterfully annotated edition of the 2nd-century Chinese character dictionary *Shuowen Jiezi* 说文解字, proposed the axiom *tongsheng bi tongbu* 同声必同部 ‘characters sharing a phonetic element must belong to the same rhyming class [of OC]’. We refer to characters sharing a phonetic element as *xiesheng* 谐声 ‘harmonizing sound’ characters, and say that they form a *phonetic series*. Chinese characters in phonetic series must have had similar pronunciations at the time those characters were created. Thus *dié* 垤 ‘white hempen mourning cloth’, although it does not appear in rhyming position in *Shijing* and so cannot be assigned to a rhyming class based on *Shijing* analysis, was assigned by Karlgren to Group 10 because it shares the phonetic element “室” with both *dié* 垤 and *shì* 室. In this way the vast majority of ancient Chinese characters could be grouped into rhyming classes.

Karlgren went beyond the work of Qing philologists in several crucial respects. He had a phonetically based theory of rhyming and of phonetic series similarity; he assumed that for monosyllabic words to rhyme in OC, they must have had similar or identical nuclei (or *main vowels*) and similar or identical codas (or *endings*). He assumed that characters in the same phonetic series also had similar onsets (or *initials*).

Second, he assumed that the OC language was directly ancestral to the MC language that he had already reconstructed. (See chapter 6 in this volume.) One of the basic tenets of historical linguistics is that sound change is regular; Karlgren therefore set out to account for changes in pronunciation from OC to MC by regular rules of sound change. Second, just as he had done for MC, Karlgren's goal was to provide a representation of OC pronunciation expressed in phonetic symbols (i.e., to give form to rhyming classes and phonetic series). In other words, Karlgren was the first to establish an OC reconstruction that was *systematic* and *concrete*.

The following examples illustrate Karlgren's method. The paired characters in each of the following sets belong to one phonetic series. Karlgren's (1957 sets 1172, 1188, 413) MC reconstructions and abbreviated English glosses are provided along with Modern Standard Mandarin pronunciations. An IPA representation of Karlgren's notation is given in brackets.

- (1a) 工 *gōng* 'work' MC kung [kʊŋ]
 (1b) 江 *jiāng* 'Yangtze River' MC kāng [kɑŋ]
- (2a) 童 *tóng* 'boy, young man' MC d'ung [dʰʊŋ]
 (2b) 撞 *zhuàng* 'strike' MC d'äng- [dʰɔŋ]
- (3a) 至 *zhì* 'arrive' MC tsì- [tʃi]
 (3b) 致 *zhì* 'cause to come' MC tì- [ti]

To reconstruct OC, Karlgren needed to bring the pronunciations of the words in each pair into closer alignment while still accounting for all MC distinctions through conditioned sound change. His results are shown in the following. (Karlgren follows standard historical-linguistic practice in marking his reconstructed OC forms with an asterisk, indicating that these are hypothetical, unattested pronunciations.)

- (4a) 工 *gōng* 'work' MC kung [kʊŋ] OC *kung [kʊŋ]
 (4b) 江 *jiāng* 'Yangtze River' MC kāng [kɑŋ] OC *kūng [kʊŋ]
- The characters “工” and “江” belong to Karlgren's Group 32, consisting of words rhymable with -ung. To account for the distinct MC vowels, Karlgren reconstructed *jiāng* 江 with OC vowel *ü [ʊ], which is close enough to *u to rhyme but regularly develops to MC ä in this environment.
- (5a) 童 *tóng* 'boy, young man' MC d'ung [dʰʊŋ] OC *d'ung [dʰʊŋ]
 (5b) 撞 *zhuàng* 'strike' MC d'äng- [dʰɔŋ] OC *d'üŋ [dʰʊŋ]

In (5) it is not only the MC vowels that differ but also the MC initials. To account for the use of “童” as phonetic in “撞”, Karlgren reconstructed both words with the same onset, *d. He argued that the quality of the vowel ü retracted the tongue position of the preceding consonant, leading to the distinct MC post-alveolar initial d.

- (6a) 至 *zhì* 'arrive' MC tsì- [tʃi] OC *tʃed [tʃed]
 (6b) 致 *zhì* 'cause to arrive' MC tì- [ti] OC *tʃed [tʃed]

In (6) Karlgren was unable to account for the differing MC pronunciations by reconstructing the same initial consonant for the OC pronunciations of both words. Instead he reconstructed a palatal stop as the source of the MC palatal affricate in “至” and an alveolar stop as the source of the post-alveolar stop in “致”. These two stops were presumed to be close enough in place of articulation, and thus in auditory impression, to tolerate the use of “至” as the phonetic element in “致”.

5.5 FEATURES OF KARLGREN'S OLD CHINESE AND LATER REVISIONS

Throughout the second half of the 20th century, scholars in both China and the West, making use of Karlgren's basic methodology, refined and improved OC reconstruction. Some features of Karlgren's OC are no longer accepted, others remain controversial, and some are now widely accepted in modified form. The ramifications of these revisions for the reconstruction of individual words can be seen in Table 5.1.

Table 5.1 Comparative chart of reconstructions in selected English-language publications

| | K1957 | L1971 | B1992 | S2009 | B&S2014 |
|--------------------------------|--------|--------|--------|-------------|--------------|
| 工 <i>gōng</i> 'work' | kung | kung | kong | kōŋ=kioŋ | k'ōŋ |
| 江 <i>jiāng</i> 'Yangtze River' | kūng | krung | krong | kōŋ | k'roŋ |
| 童 <i>tóng</i> 'boy, young man' | d'ung | dung | dong | dōŋ | (Ca)[dʰoŋ |
| 撞 <i>zhuàng</i> 'strike' | d'tung | drungh | drongs | d'ōŋh | N-tʰ< r>oŋ-s |
| 至 <i>zhì</i> 'arrive' | t'ied | t'ich | t'its | t'is | t'i[ɰ]-s |
| 致 <i>zhì</i> 'cause to come' | t'ied | t'ich | t'jits | t'its | tr'i[ɰ]-s |
| 闐 <i>lán</i> 'railing' | gân | glan | g-ran | rân < g-ran | kei'ran |
| 乘 <i>jián</i> 'select' | kian | kranx | kran? | k'ên? | k'ran? |

Note: Asterisks have been omitted for simplicity. Consult the individual publications for information on notation.

K1957 = Karlgren 1957; L1971 = Li Fang-Kuei 1971; B1992 = Baxter 1992; S2009 = Schuessler 2009
 ["Minimal Old Chinese" forms]; B&S2014 = Baxter and Sagart (2014).

5.5.1 Old Chinese Tone and Tonogenesis

In a brilliant analysis, the French scholar André-Georges Haudricourt (1954) demonstrated that Vietnamese tones were generated from ancient coda consonants that were subsequently lost. In particular, he proposed that one class of Vietnamese tones arose from earlier *-s. Haudricourt also noted that Chinese words borrowed at an early stage into Vietnamese participated in the same process of tonal development. This in turn led to the hypothesis that the MC departing tone (*qusheng* 去声) was derived from OC *-s; this hypothesis is now widely accepted and has been corroborated through other evidence. It is now also widely accepted that the MC rising tone (*shangsheng* 上声) developed out of a lost OC *-ʔ.

5.5.2 Voiced Stop Codas

In *Shijing*, MC entering-tone (*rusheng* 入声) words—those distinguished by stop codas -p, -t, and -k—rhyme frequently with MC open-syllable words in other tones. For example, in the excerpt of *Shijing* reproduced earlier, the three rhyming words *dié* 玆, *shí* 寔, and *zhí* 寔 all end in -t in MC. The fourth rhyming word *zhí* 寔, in contrast, is an MC open-syllable departing-tone word. To explain this phenomenon, Karlgren reconstructed some non-entering-tone words with OC voiced stop codas such as *-d as in (6a). Karlgren argued that during the OC period *-d and *-t were sufficiently similar to permit rhyming and membership in the same phonetic series; in the development of MC, voiced codas were lost. Today most scholars reject voiced stop codas. The intermixture of MC open syllables and stop-coda entering-tone syllables, as in (6), is explained in other ways. Most scholars today reconstruct *zhí* 寔 with cluster ending *-ts. The similarity of *-t and *-ts accounts for rhyming, while the *-s conditions the loss of the preceding *-t and the development of MC departing tone.

5.5.3 Consonant Clusters

Some characters occurring in the same phonetic series have such divergent MC initials that it is not possible to reconstruct both with simple initial consonants. A well-known example is *lán* 蘭 ‘railing’, whose MC onset is l-; the phonetic elements is *jiān* 兼 ‘select’, whose MC onset is k-. Karlgren (1954:280) reconstructed OC initial clusters, proposing 乘 *klan > kan and 蘭 *glán > lán. As work has progressed on the analysis of phonetic series, the types and varieties of consonant cluster initials has increased greatly from those that Karlgren originally proposed. Most reconstruction systems today include clusters of the type *Cl-, *Cr-, and *sC- (where C represents an obstruent); some scholars reconstruct many other types of initial clusters. The theory of tonogenesis leads to the reconstruction of cluster codas such as *-ks and *-mʔ. As discussed later, hypotheses about OC morphology also now play an important role in the reconstruction of consonant clusters.

5.5.4 Old Chinese Medial *-r-

The Russian linguist S.E. Yakhontov (1960) demonstrated that a certain set of MC syllables arose not from a distinct OC vowel, as Karlgren had proposed (see (4b) and (5b)), but from a “medial element” intervening between the onset and nucleus. This hypothesis was later elaborated by such scholars as Li Fang-Kuei (1971), who reconstructed the medial element as *-r-. The hypothesis permitted the reconstruction of identical vowels, and of initial consonants at the same place of articulation, in cases like (4), (5), and (6).

5.5.5 Rhyming and Vowels

In order to account for the large number of distinct MC vowel sounds that derive from OC rhyming words, Karlgren reconstructed many different OC vowels and had to assume that speakers of OC rhymed words with similar, but not identical, vocalic nuclei, as in (4) and (5). Most scholars today propose that OC poets were stricter in their rhyming habits. Thanks to the medial *-r- hypothesis, it became possible to reconstruct only a single main vowel for all the words in any given rhyming set, reducing the number of vowels to half a dozen or fewer. Li (1971) proposed a four-vowel system, but increasingly scholars are accepting the views of linguists like William Baxter, whose statistical analysis of *Shijing* rhyming (Baxter 1992, chapter 3) lent further credence to earlier proposals by Yakhontov and the Russian scholar Sergei Starostin for a six-vowel OC system. Six vowels are also favored by many prominent Chinese linguists such as Pan Wuyun 潘悟云 and Zhengzhang Shangfang 郑张尚芳.

5.5.6 Initial Consonant Types

Karlgren reconstructed OC with four types of obstruents: voiceless unaspirated (e.g., *t [t]), voiceless aspirated (*tʰ [tʰ]), plain voiced (*d [d]), and voiced aspirated (*dʰ [dʰ]) (i.e., murmured or breathy). Scholars today reconstruct only three basic types: *t, *tʰ, *d. In addition, Karlgren’s OC palatal stops (as in (6a)) have been abandoned. However, proposals for additional types of initial consonants have gained currency. These include a series of voiceless resonants such as *m₃, *n₃, and *l- and most recently a series of uvular initials *q-, *qʰ-, and *g- (Pan 1997; Sagart and Baxter 2010).

5.5.7 The Old Chinese Type A/B Distinction

Evidence from MC strongly suggests that there was a fundamental distinction between two syllable types in OC, which Pulleyblank (1973) called “Type A” and “Type B.” In MC, Type B syllables are characterized by palatalized features. Karlgren reconstructed such syllables with OC palatal on-glide *i [j]. Citing a variety of types of evidence, as well

as a variety of phonological theories, later scholars proposed many alternative explanations for the Type A/B distinction, including a prosodic (i.e., stress) distinction, a vowel length distinction, and a pharyngealized feature of the initial consonant. Some scholars acknowledged the distinction without venturing a phonetic reconstruction. Increasingly, Karlgren's solution is no longer accepted by modern scholars, but the precise nature of the distinction remains a matter of controversy.

5.6 WORD FAMILIES AND MORPHOLOGY

Beginning in the 1990s, purely phonological updates to OC reconstruction were paralleled by a newly reinvigorated avenue of investigation: OC morphological processes. In the past few decades, work on OC word families and morphological affixes have brought the role of internal reconstruction to the fore and catalyzed a profound reinterpretation of the phonological reconstructions that were proposed in the late 20th century, as well as of the basic typological nature of the OC language.

That Chinese, like all other languages, has word families—sets of words that are etymologically related and have been derived over time from a single root by means of various morphological processes—has never been in doubt. The native Chinese tradition has long recognized such etymological relationships. As early as the late 19th century, the Western scholar Conrady (1896) was exploring this phenomenon in the context of the Sino-Tibetan language family. Karlgren himself expounded on the topic in his 1934 publication “Word Families in Chinese”. The most influential historical phonologist of the 20th century in China, Wang Li 王力, also published a volume on Chinese word families (Wang 1982). But Karlgren's and Wang's identification of word families was largely based on superficial similarity of pronunciation and meaning. This represented only a slight improvement on the native Chinese philological tradition. One of the key 20th-century publications on this topic was Downer (1959), which analyzed pairs of related words differing by MC tone class to elaborate a systematic and comprehensive description of the morphological functions of the tonal distinctions. For example, it has long been recognized that there are many word pairs in Chinese that are of different word classes and whose pronunciation differs only in tone. (These pairs are sometimes written with the same Chinese character and sometimes with different Chinese characters.) Consider the Chinese verb *mó* ‘to grind’ and noun *mó* ‘a grindstone’, both written 磨. In MC, as in modern Mandarin, these two words are pronounced identically except for tone; ‘a grindstone’ is pronounced in the departing tone. One of several functions of the departing-tone derivation, Downer made clear, was to create nouns out of verb roots.

Given the tonogenetic theories advanced initially by Haudricourt, it soon became apparent that what from the perspective of later stages of Chinese appear to be tonal processes were, in fact, at the OC stage, simply affixal processes. If departing-tone words are reconstructed with OC *-s, then this *-s can, in some words, be identified as a derivational suffix—specifically, a deverbal nominalizing suffix. Baxter (1992) reconstructed the two words as *maj ‘to grind’ and *majs ‘a grindstone’.

A comprehensive, sophisticated analysis of ancient Chinese word-family relationships is only now underway. As the phonological aspects of OC reconstruction have improved, more systematic evidence for regular relationships between the pronunciations and meanings of related words has come to light and new morphological affixes have been proposed. In other words, the technique of internal reconstruction, leading to recovery of the older forms of the roots and affixes of derived words, is now being applied to Chinese. The fruits of this work can be seen in Chinese publications like Jin (2006). In the West, some of the most influential recent work in this area has been carried out by Laurent Sagart, often in collaboration with William Baxter. Baxter and Sagart (1998) and Sagart (1999) were early explorations of these ideas, which are now fully incorporated into Baxter and Sagart (2014). Perhaps the most comprehensive expression of this new understanding of OC morphology is Schuessler (2007), the first linguistically sophisticated etymological dictionary of Chinese, presented with an elaborated set of hypotheses concerning OC morphological processes.

OC now appears to be a fundamentally different language from all known later forms of Chinese. It was atonal and had an elaborate system of subsyllabic morphological affixes, a complex syllable structure including numerous cluster types occurring in both onset and coda position, and some sort of nonsegmental syllabic distinction (the Type A/B distinction). Some of these features can be illustrated with a few examples of reconstructed words in the system of Baxter and Sagart (2014):

- | | | | |
|-----|---|--------------|---|
| (7) | 菜 | ‘vegetables’ | OC *s ₁ ʃʔ-s > MC tshojH > Mandarin <i>cài</i> |
| (8) | 教 | ‘teach’ | OC *m-kʰruk-s > MC haewH > Mandarin <i>xiào</i> |
| (9) | 爍 | ‘melt’ | OC *ʔewk > MC syak > Mandarin <i>shuò</i> |

In (7), suffix *-s derives the noun ‘vegetables’ from the verb *cài* 采 ‘to pluck’ *s₁ʃʔ. In (8), suffix *-s derives the outwardly-directed action ‘teach’ from intransitive *xue* 學 ‘study’ *m-kʰruk (the *m- in ‘study’ is a volitional prefix). Baxter and Sagart reconstruct Type A syllables as pharyngealized, noted by ʔ in (7) and (8), in contrast with the Type B syllable in (9).

How this language was transformed into the typologically quite different languages seen from the Han dynasty onward remains one of the great mysteries of the history of Chinese and suggests the possibility of major disruptive changes due to language contact.

5.7 AREAS OF CONTROVERSY AND FUTURE DIRECTIONS

The new reconstructions of OC have transformed our view of the relationship between Chinese and other ancient languages of the region, revealing morphological processes that are similar to those in Tibeto-Burman languages (see chapter 4 on morphology in this volume) and exposing early borrowing into and out of Chinese. It seems certain that

improved OC reconstructions will enhance not only our understanding of the history of Chinese itself but also of the prehistorical connections among the major language families of East Asia (see chapter 5 on classification of Chinese in this volume).

But the story of OC reconstruction is far from over. Many controversial questions remain. In part this is simply because there aren't sufficient constraints in the available evidence to definitively eliminate competing hypotheses. The nature of the nonalphabetic writing system means that the presence or absence of individual segments within the syllable is not easy to confirm or deny. Phonetic series and rhyming practices leave room for a variety of interpretations, some nonlinguistic, which are in turn influenced by individual and scholastic biases among scholars. Given this state of affairs, we can expect controversy to remain a hallmark of the field, even as new techniques and new attitudes raise the possibility of reaching consensus on many points.

Additional methodological breakthroughs are still possible. At the beginning of this chapter, three basic techniques in historical reconstruction were mentioned: textual analysis, internal reconstruction, and the comparative method. To date, the comparative method has not been meaningfully applied to the reconstruction of ancient Chinese. Some scholars believe that it cannot be—that the historical rupture that occurred in the development of Chinese around the Han dynasty means that there is no common ancestor of modern forms of Chinese that predates the Han, so the comparative method cannot take us as far back as the first millennium BCE. Initial forays into comparative reconstruction, such as Norman's (2006) "Common Dialectal Chinese," are consistent with this notion. But it is also possible that more thorough investigation into the histories of various Chinese dialects—the Min 閩 dialects of Fujian province would seem to be most promising in this regard—will provide sufficient data for the application of the comparative method, opening up another avenue of exploration to complement the techniques of textual analysis and internal reconstruction.

One thing is certain: we are in the midst of a very exciting time in the field of OC historical reconstruction. The next few decades will see significant advances in our understanding of ancient Chinese. These advances will in turn permit us to explore further the interconnections among the great language families of East and Southeast Asia and situate Chinese more precisely within the linguistic history of the continent.

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CHAPTER 6

MIDDLE CHINESE
PHONOLOGY AND QIEYUN

WUYUN PAN AND HONGMING ZHANG

6.1 INTRODUCTION

As part of the Chinese historical phonology, Middle Chinese (from c.5th century CE to 12th century CE) phonology, derived from Old Chinese (from c.1700 BCE to 1st century CE) and evolving into Modern Chinese (from c.15th century CE to present) later, is an important stage as well as a turning point in the development of Chinese phonology. A good understanding of Middle Chinese phonology is a key to solving many problems in the history of Chinese language(s). For example, there are still controversies over the periodization of Middle Chinese phonology. From Duan Yucan 段玉裁 in Qing Dynasty until today, there have been altogether nineteen proposals regarding it by about twenty-eight scholars (Duan 1775/1988; Karlgren 1915–1926a/1915–1926b; Wei 1935/1996; Lin 1937; Li 1956, 1979; Luo 1956; Cheng 1966; Stimson 1966; Zhou 1966; Tung 1968; Ting 1975, 1995; Ho 1981; Shao 1982; Wang 1985; Pan 2000), the main differences of which regard (a) whether the Han and the Wei Dynasties (202 BCE to 265 CE) should be divided between Old and Middle Chinese (should the Western Han and Eastern Han Dynasties [202 BCE to 220 CE] fall within the period of Old or Middle Chinese?); (b) whether the Wei and Jin Dynasties (220 CE to 420 CE) should belong to the Middle Chinese period; (3) whether the Sui and Tang Dynasties (581 CE to 907 CE) should be included in the Middle Chinese period; and (4) whether the Song Dynasty (960 CE to 1279 CE) should belong to Middle or Pre-Modern Chinese. These questions concern the criteria of the periodization, the nature of the dialect(s), the nature of the historical documents, the relationship between synchronic description and diachronic evolution of the language, the nature of the transition periods of sound changes, and so on. With limited space, it is impossible to describe every detail here. Therefore, all we can do is to decide the typical periods of Old Chinese and Middle Chinese, that is, the times during which *Shijing* 诗经 (from c.1100 BCE to 600 BCE) and *Qieyun* 切韵 (c.700 CE) came out, respectively.

This chapter focuses on the so-called “Middle Chinese phonology” by referring to the phonological system presented in such documents as *Qieyun* and *Jingdian Shiwen* 经典释文, in which the subsystems of initials, rhymes, and tones of Middle Chinese phonology have been clearly documented. Moreover, because the significant influences that the Central Plain dialect(s) wielded on the surrounding dialects all happened in Middle Chinese, close phonological correspondences have been found between Middle Chinese and the resulting literary pronunciations in various Chinese dialects and the pronunciations of Chinese borrowings in Japanese, Vietnamese, and Korean. This has enabled us to reconstruct Middle Chinese phonology through the historical and comparative studies. Nevertheless, the Middle Chinese phonology discussed here is basically the phonological system represented by *Qieyun*, which depicts the literary pronunciation in the areas around Luoyang and Nanjing in the 7th century CE.

6.2 THE NATURE OF QIEYUN

With the fall of the Western Jin Dynasty in 316 CE, Emperor Yuan, the founder of the Eastern Jin, relocated the capital of Jin to Nanjing, together with his family and a large number of scholar-officials. Consequently, two different language communities came into being in Nanjing at that time, with the majority of the lower class speaking the local Wu dialect while the upper class spoke the Luoyang speech. This is quite similar to the situation in Taiwan after 1949, in which the lower classes spoke Southern Min dialect while Mandarin Chinese, which was brought in from the Mainland China, was set as the official language as well as the medium of instruction at all schools. After the language evolution of more than 300 years, by the time of *Qieyun*, both the speech originally used in Luoyang and the one brought into and used by the upper class in Nanjing were no longer the same as before. Comparatively speaking, the language of instruction was more conservative, with the “pure” language and the phonetic features that were by this time distinguishable probably only by the older generations. The students who were speaking a different form of vernacular were taught to read the books of the sages with this conservative pronunciation. Consequently, a literary pronunciation system was gradually formed. Nonetheless, the literary pronunciation passed down from the older generations through parents, elder brothers, or private teachers might vary. For instance, *Jingdian Shiwen* by Lu Deming 陆德明 (c.550–c.630) and *Yupian* 玉篇 by Gu Yewang 顾野王 (519–581) were based on the literary pronunciation systems that their compilers had learned. In spite of the commonalities shared in these two books, they do differ from each other in many ways. Yan Zhitui 颜之推 (531–c.595), Xiao Gai 萧该 (c.535–c.610), and several other scholars took up the tasks of sorting out various literary pronunciation systems in Nanjing and Luoyang before working out the basic framework of the phonological system of *Qieyun*. Finally, it was Lu Fayuan 陆法言 who did the actual writing of *Qieyun*. Since it was not long after the Nanjing and Luoyang speeches diverged from a common language, the phonological system presented in *Qieyun* can thus be

considered as based on homogeneous data and derived from the same source language. However, in the course of compiling *Qieyuan*, Lu Fayan referred to some old rhyme books and character dictionaries, and when he found any inconsistencies between the pronunciation notations in these documents and the literary pronunciation system, he simply included them as an entry. Therefore, it is necessary for us to distinguish these heterogeneous materials while making an effort to understand the phonological system of *Qieyuan* (Maspero 1920; Chen 1949; Zhou 1966).

The internal homogeneity of the phonological system of *Qieyuan* is clearly recorded by the information contained in *Qieyuan*. For instance, two Chinese characters were used by *fangqie* 反切, the 'turning and spelling' method, to indicate the pronunciation of a character. The information of the initial consonant of a syllable signaled by a character is reflected by the initial of the first character of *fangqie* (i.e., *fangqie shangzi* 反切上字 'the upper-character'), and the information about the rhyme of the same character is reflected by the syllable of the second character, minus the initial of *fangqie* (i.e., *fangqie xiazì* 反切下字 'the lower-character'). In light of this method, linguists sort out the subcategories of the initials and rhymes in *Qieyuan* systematically to understand the classifications of the initials and rhymes that Lu Fayan made in *Qieyuan*. It would be incredible if *fangqie* was made from cobbling different dialects together, instead of drawing from the pronunciation of Lu his own.

6.3 QIEYUN AND THE SUBSEQUENT RHYME BOOKS

The original copy of *Qieyuan* has been long lost except for some of its fragments unearthed in Dunhuang city 敦煌¹, which has been repeatedly revised and expanded since the Tang Dynasty. Two of the best revised editions preserved to this day are *Kanmiu Bugue Qieyuan* 刊繆补缺切韵 'Corrected and Supplemented *Qieyuan*', abbreviated as *Wang San* 王三 (c.706 CE), revised and published by Wang Renxu 王仁煦 (c.656–c.710), and *Guangyun* 广韵 'Expanded Rhymes', compiled by Chen Pengnian 陈彭年 (961–1017) and others in the Northern Song Dynasty (960–1127). The phonological systems presented by *Wang San* and *Guangyun* are more or less similar to that by *Qieyuan*, and both are preserved in such a complete condition that they are widely used as the basic materials for linguists to study Middle Chinese phonology. Therefore, the phonological system of *Qieyuan* discussed in this chapter actually refers to the one(s) presented in *Wang San* and *Guangyun* (Zhou 1966; Pan 2000).

Many other rhyme books were compiled around the same time that *Qieyuan* came out, including *Jingdian Shiwen*, *Yupian*, and *Yigie Jing Yin Yi* 一切经音义, which came into being between 661 and 663 and was written by Xuan Ying 玄应. After *Qieyuan*, many rhyme tables appeared, such as *Yunjing* 韵镜 (c.1007 to 1037) 'Mirror of Rhymes' and *Qiyin Lue* 七音略 (c. 1162), both of which were compiled based on *Qieyuan*. These books are important reference materials for research on Middle Chinese phonology.

6.4 THE PHONOLOGICAL SYSTEM IN QIEYUN

The rhyme books like *Qieyuan* were written to help the literati make poems with correct rhymes. Therefore, the characters in rhyme books were classified according to the rhymes. There were no phonetic symbols yet invented at that time, so each rhyme category was represented by a Chinese character belonging to that category. For example, the character *dong* 东 was pronounced as [tʊŋ] during that time, so this character 东 was used to represent the rhyme category of [-uŋ]. Tones should also be taken into consideration for rhyming; thus the term "rhyme" in *Qieyuan* is not quite equivalent to the term "rhyme" used in general linguistics. Within the same rhyme category [-uŋ], the characters with the *pingsheng* 平声 'level tone' were classified into the rhyme group 东; those with the *shangsheng* 上声 'rising tone' into the rhyme group *dōng* 董, and *qusheng* 去声 'departing tone' into the rhyme group *sòng* 送. When it came to *Yunju* 韵图 'rhyme table' in the Tang and Song Dynasties, people started to name the initial consonants likewise. For instance, the character *jian* 见 was pronounced with the initial consonant [k-] in Middle Chinese, so it was used to represent the initial [k-]. However, *Qieyuan* was not edited for the sole purpose of rhyming but also for correcting pronunciation. *Fangqie* was a method to designate the pronunciation of a character at that time by using another two characters, with the first one (the upper character) representing the initial consonant and the second (the lower character) representing the final. For example, the character 东 is represented as *de hong fan* 德红反, whereas *de* 德 represents the initial consonant [t-] while *hong* 红 has [-uŋ] as its final. The medials, whose position is not consistently indicated, are usually represented by the lower characters but sometimes by the upper characters. Combining the information provided by the upper and the lower characters, different initials and finals can be distinguished. There may be more than one final under one rhyme group, such as the rhyme group 东, which includes two finals, [-uŋ] and [-iuŋ]. The characters that share the same initial and final in one rhyme group form a subset called *xiaoyun* 小韵 'small rhyme', namely the homophones. Based on *fangqie*, the phonological structure of *Qieyuan* can be illustrated as shown in Figure 6.1.

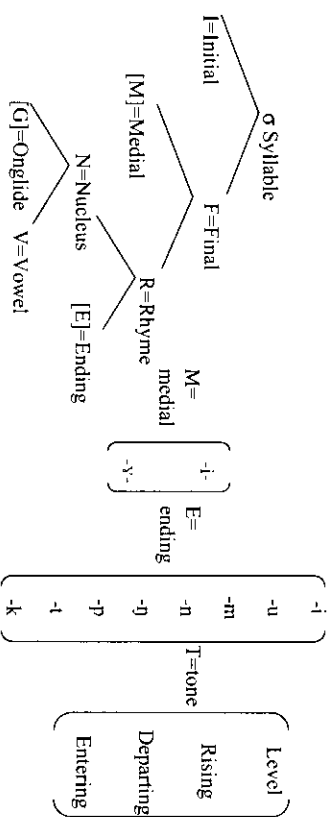


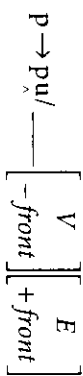
FIGURE 6.1 Phonological Structure of *Qieyuan*

The medial, ending, and onglide that are bracketed are optional; namely, they may not necessarily exist in the pronunciation of a character.

The term “ending” here is not exactly the same as the term “coda” in Indo-European phonology since it includes vocalic endings, [-i] and [-u]. Some rhyme groups in the *Qieyun*, such as *mo* 模, *yu* 虞, *dong* 冬, *zhong* 鍾, *hai* 灰, *hun* 魂, also have an onglide [-y-], which does not have a phonemic value but simply functions as a part of the nucleus instead (discussed more later).

Based on the systematic analysis on the upper characters in *Qieyun*, a system that contains thirty-six initials is summarized in Table 6.1.

Except labial initials, all other initials of Middle Chinese are divided into two groups: unrounded and rounded. Syllables with unrounded consonants, C-, are classified into the *kaikou* 开口 ‘unrounded’ group while those with rounded initials, Cw-, go into the *hekou* 合口 ‘rounded’ group, such as the distinction between *ge* 歌 [ka] and *guo* 果 [kwa]. However, another type of *hekou* was found in rhyme tables of the Song Dynasty. When the first vowel of the finals is the vowel *u* or onglide *u*, there should be no contrast between C- and Cw- initials, but in the rhyme tables of the Song Dynasty, the words with these rhymes were found classified as *hekou*. Labials in the rhymes like *wei* 微, *fei* 廢, *wen* 文, *yuan* 元, *han* 寒, *wu* 物, *yue* 月, and *he* 喝, which all consist of a back or a central vowel and an ending with [+front] feature; usually an onglide [y] would also be generated:



But they were classified as *hekou* in the rhyme tables of the Song Dynasty in spite of the fact that they are two different *hekou* in nature because in the former case roundness is a feature that belongs to the finals while in the latter case it belongs to the initials.

Little is known about the true value of the tones in Middle Chinese. It is commonly accepted that the *pingsheng* is with a level contour; the *shangsheng* a high rising tone, the *qusheng* a falling tone, and the *rusheng* 入声 ‘entering tone’ a checked tone (a syllable that ends with a stop consonant). Thus their tonal values may be reconstructed as 133, 135, 151, and 13?, respectively.

After the Tang Dynasty, the concept of *deng* 等 ‘division’ came up in the rhyme tables, that is, the four degrees of frontness, from *qing* 轻 ‘light’ to *zhong* 重 ‘heavy’. *Qing* means the tongue position is front; *zhong* means back. This notion applies both to consonants and vowels. For example, if we compare the main vowels of *tang* 唐 [aŋ] rhyme with *yang* 阳 [iaŋ] rhyme, since [a] is “backer” than [a], 唐 rhyme is listed in the first division (“the backest”) while 阳 rhyme is listed in the third division. In 阴 rhyme group, according to the backness of the initials’ tongue positions, the characters with the initials *jing* 精 ts-, *zhang* 章 tʃ-, and *zhuang* 庄 tʃ- are classified into the fourth, third, and second division, respectively.

Table 6.1 Initials of Middle Chinese

| | | | | | | | | | | | |
|---------------------|---|----------------|---|---|-----------------|--|---|-----------------|--|---|-----------------|
| Group 幫 (Bilabials) | 幫 | p | Group 端 (Alveolar stops, lateral, and nasal) | 端 | t | Group 知 (Retroflex stops, and nasals) | 知 | ʈ | Group 章 (Palatal fricatives, and affricates) | 章 | tʃ |
| | 滂 | p ^h | | 透 | t ^h | | 徹 | ʈ ^h | | 昌 | tʃ ^h |
| | 並 | b | | 定 | d | | 澄 | d̪ | | 禪 | d̪ʃ |
| | 明 | m | | 泥 | n | | 娘 | ŋ | | 書 | ʃ |
| Group 見 (Velars) | 見 | k | Group 精 (Alveolar fricatives, and affricates) | 來 | l | Group 庄 (Retroflex fricatives, and affricates) | 庄 | tʃ | Group 船 (Labial fricatives, and affricates) | 船 | ʃ |
| | 溪 | k ^h | | 精 | tʃ | | 初 | tʃ ^h | | 日 | ɲ |
| | 群 | g | | 清 | tʃ ^h | | 崇 | dʒ | | 以 | j |
| | 疑 | ŋ | | 从 | dʒ | | 生 | s | | | |
| Group 影 (Gutturals) | 影 | ʔ | 心 | s | | | | | | | |
| | 曉 | h | 邪 | z | | | | | | | |
| | 匣 | ɦ | | | | | | | | | |

Table 6.2 Divisions of Middle Chinese

| | Group 端 | Group 精 | Group 知 | Group 庄 | Group 章 | Initial 匣 | Initials 以, 邪, 穿, 群, 舌 |
|--------------|------------|------------|------------|------------|------------|--------------|---------------------------|
| 1st division | + | + | | | | + | |
| 2nd division | | | + | + | | + | |
| 3rd division | | + | + | + | + | | + |
| 4th division | + | + | | | | | |

Table 6.3 Medials of Middle Chinese

| Divisions of Middle Chinese | 1st division | 2nd division | Type B of 3rd division | Type A of 3rd division | 4th division |
|-----------------------------|--------------|--------------|------------------------|------------------------|--------------|
| Medials | -Ø- | -y- | -y'- | -i- | -Ø- |

Since structuralism was introduced into the field, linguists have started to divide the finals into four divisions according to the co-occurrences between the consonants and vowels, which are shown in Table 6.2.

Such a distribution is quite similar to the *shu* 四呼 (namely four types of finals, i.e. *kai* 开 'finals without medials', *qi* 齐 'finals with the medial [i]', *he* 合 'finals with the medial [u]', and *cao* 撮 'finals with the medial [y]') and the initials in Modern Mandarin. These initials, like *k*, *kʰ*, *x*, *tʂ*, *tʂʰ*, and *ʂ*, are not allowed to spell with *qi* 齐 and *cao* 撮. These initials, like *ts*, *tsʰ*, and *c*, are not allowed to spell with *kai* 开 and *he* 合. Different *deng* 'divisions' actually corresponded to different medials in Middle Chinese, just as the *shu* shows the differences of the medials (including the first vowels in finals) in Mandarin. See Table 6.3.

The first and fourth division finals have the same co-occurrence constraints with the initials in the *Qieyuan* period. They actually could be considered as the same type, since neither of them had a medial. By the time of the late Middle Chinese, the finals on the fourth division, which all had main vowel [e], generated an onglide [-j-], which later became a medial [-i-] and thus got mixed up with the third division. For instance, the pronunciation of *xian* 先 changed from [sen] to [sien] first, then became [sien].

The medial [-y-] showed up in the second division, such as *jia* 家 [ɣya].

The labials, velars, and gutturals that co-occurred with the finals on the third division of rhymes *zhi* 支, *zhi* 脂, *xiao* 宵, *ji* 祭, *xian* 仙, *yan* 盐, *zhen* 真, and *qin* 侵 split into two subtypes. For example, the *zhi* 脂 rhyme combined with the initial *bing* 並 in *qusheng* actually has two subtypes, *bi* 鼻 and *bei* 备; this phenomenon is called *chongniu* 重纽 'doubles'. The former is called *chongniu sideng* 重纽四等 'doublet on the fourth division' or type A of the third division while the latter one is called *chongniu sandeng* 重纽三等 'doublet on the third division' or type B of the third division (Chou 1948; Pulleyblank 1970, 1971, 1983; Baxter 1992; Pan 2000). These two are put under the same rhyme since they have the same main vowel and ending except that they have different medials. Type

A of the third division has the medial [-i-] just like other characters on the third division, but type B is with the medial [-y'-].

The medial of the third division did not come up until late Old Chinese, and it had many variants, whose tongue positions differed according to the following vowels. It would become [-i-] before a main vowel [e], or combine with the following main vowel if that is a [i] or [i], or get a [+back] feature before a central or back vowel. By the middle and late period of Middle Chinese, these variants all merged into one single medial [-i-]. Therefore, it can be transcribed by /i/ in general.

Each *yunmu* 韵目 'names of rhymes' represents a rhyme in *Qieyuan*; hence the characters under the same *yunmu* must have the same main vowel, ending, and tone, which is a significant principle for reconstructing the *Qieyuan* system. Bernhard Karlgren (Karlgren 1915–1926a) also pointed out this principle that only the main vowels (including the endings of course) can determine the classifications of *yunbu* 韵部 'rhyme groups'. However, even Karlgren himself violated this principle very often in his reconstruction. For example, *hen* 痕 and *hun* 魂 are two different rhymes in *Qieyuan*, but he reconstructed them as with the same main vowel and ending, [ɛn] and [uɛn].

According to the systematical analysis on the *fanqie* and the principles for classifying rhymes in *Qieyuan*, depicted previously, the finals of *Qieyuan* can be reconstructed as shown in Table 6.4 (the lower small case figures 'one', 'two', and 'three' in the following represent *deng* 'division', e.g. 东一 stands for the first division of *dong* 东 rhyme and 东三 for the third division of *dong* 东 rhyme. Those within the brackets indicate their variation).

Characters of the third division of the *ge* 歌 rhyme are used exclusively in the transcription of loanwords. They originated rather late and are not covered in the *Qieyuan* phonology in this chapter.

In Table 6.4, the finals are given in the even tone only, but they co-occur with the rising, departing, and entering tones as well. For instance, [-uŋ] is true for all the relevant rhymes, including *dong* 东 rhyme, *dong* 董 rhyme in the rising tone, and *song* 送 rhyme in the departing tone. In Middle Chinese, each rhyme that has a nasal ending carries a rhyme corresponding to its obstruent ending with the same place of articulation (e.g., an~at, am~ap, and aŋ~ak). For the sake of convenience in terms of analysis, *wu* 屋 rhyme [-uk] normally falls under *dong* 东 rhyme [-uŋ].

Rhymes *zhen* 臻 and *zhi* 脂, reconstructed as [-in] and [-it], are the allophones of rhyme *zhen* 真 and *zhi* 质, respectively. For the sake of economy, they are put in the same cell with rhyme 真.

When a *yan* 严 (ɣ) rhyme co-occurs with a labial consonant initial and the even or entering tone, an onglide [-y-] will be generated, causing the main vowels to become a little rounded. Lu Fayuan thus classified them as an independent rhyme *fan* 凡 (乏).

According to the tables presented in this chapter, the IPA chart of the main vowels in *Qieyuan* can be shown as in Figure 6.2.

There are fifteen allophones of six vocalic phonemes in *Qieyuan*, /a/, /e/, /ə/, /i/, /u/, /o/. They have remained unchanged for more than 1,000 years from Old Chinese to Middle Chinese except that the phonological content each phoneme governs in Middle Chinese are not the same as those of Old Chinese.

Table 6.4 Finals of Middle Chinese

| Phoneme | a | e | i |
|---------------------|---------|---------|----------------------------|
| Division and Medial | 1st -i- | 2nd -y- | 3rd type A -i- type B -yi- |
| Ending | a | æ | ɛ |
| Vowel | a | æ | ɛ |
| Ending | a | ɛ | e |
| Vowel | a | ɛ | e |

| Phoneme | a | o | u |
|---------------------|---------|---------|---------|
| Division and Medial | 1st -i- | 2nd -y- | 3rd -i- |
| Ending | a | ɔ | ɣ |
| Vowel | a | ɔ | ɣ |
| Ending | i | o | o |
| Vowel | i | o | o |

| Phoneme | a | o | u |
|---------------------|---------|---------|---------|
| Division and Medial | 1st -i- | 2nd -y- | 3rd -i- |
| Ending | a | ɔ | ɣ |
| Vowel | a | ɔ | ɣ |
| Ending | i | o | o |
| Vowel | i | o | o |

| Phoneme | a | e | i |
|---------------------|---------|---------|---------|
| Division and Medial | 1st -i- | 2nd -y- | 3rd -i- |
| Ending | a | æ | ɛ |
| Vowel | a | æ | ɛ |
| Ending | i | o | o |
| Vowel | i | o | o |

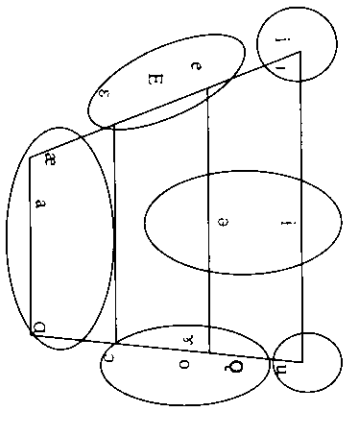


FIGURE 6.1 Vowel Chart of Qieyun

The phonetic conditions of these allophones are shown in the following (“r” represents consonant initial, “E” represents ending, |] means the content is optional, and “#” shows the end of a syllable):

- a > a / I __ a > æ / Iy __ ; [ʎ]i __ #
- e > e / Iy __ e > E / [ʎ]i __
- a > i / Ii __ i > i / (tʃ, tʃh, ʃ, dz) i __ (n, t)
- o > o / Iy __ o > o / Ii __

Since Lu Fayuan had no concept of phonemes, he distinguished sounds that had only very slight differences, based on his own principle of examining pronunciations, *po xi hao li, fen bie shu lei* [剖析毫釐, 分別黍累 ‘to set tiny segments apart and make a difference between minute weights.’ For example, rhyme *zhen zhen* 臻 and rhyme *zhen zhen* 真 were in complementary distribution, the former only co-occurring with the initial group *zhuang* 庄 and the latter elsewhere. When rhyme 真 [-in] occurs with the initial group 庄, which includes retroflexes, the place of its articulation will move back so it becomes like [-in]. Even though it is just a very tiny change of the main vowel, Lu still considered them slightly different, thus dividing them into two rhymes. The vowels of rhyme *mo* 模 [-o] and rhyme *yu* 虞 [-iɤ] differ from each other just slightly in that the main vowel of rhyme 虞 has a higher tongue position affected by the medial [-i-]. They are also in complementary distribution, with the former on the first division and the latter on the third division. This shows why there are so many allophones in *Qieyun*.

NOTES

- 1. Dunhuang is a city in northwestern Gansu province. It was a major stop on the ancient Silk Road and commands a strategic position at the crossroads of the ancient Southern Silk Route and the main road leading from India via Lhasa to Mongolia and Southern Siberia, as well as controlling the entrance to the Hexi Corridor, which led to the heart of the north Chinese plains and the ancient capitals of Chang’an and Luoyang.

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CHAPTER 7

EARLY MANDARIN
SEEN FROM ANCIENT
ALTAIC SCRIPTS*The Rise of a New Phonological Standard*

ZHONGWEI SHEN

7.1 INTRODUCTION

In the commonly accepted view, the characteristics of Mandarin phonology can be traced to the *Zhongyuan Yinyun* 中原音韵 (ZYYY), a rhyme book from the Yuan dynasty compiled in 1324 CE. However, according to recent studies on the ancient Altaic scripts, namely the Khitan Lesser Script, the Jurchen Script, and the hP'ags-pa Script (Shen 2006a, 2006b, 2007, 2008, 2011), the basic characteristics of modern Beijing Mandarin can be traced to the Liao Dynasty, about three centuries earlier than the ZYYY. These three scripts were invented and used by three groups of Altaic language speakers, the Khitans of the Liao dynasty (907–1125), the Jurchens of the Jin dynasty (1115–1234), and the Mongols of the Yuan dynasty (1271–1368). From the Liao Dynasty on, their empires ruled over the entire modern Northern Mandarin speaking area; their capitals—the south capital of Liao, the capital of Jin, and the capital of Yuan—all are the modern Beijing city.¹ Because of the three consecutive and expanding rules by Altaic speakers from the north, a regional Chinese dialect originated in the territory of Liao and gradually rose to be a new phonological standard for the whole China.

The available Chinese materials before the ZYYY are in general not very reliable. There have been good analyses of the rhyming materials of the Song and Jin times. But the rhyming materials have their intrinsic limitations. One is that poetry rhyming is usually based on the phonological system of a literary language as exemplified in rhyme dictionaries. The other is that the rhyming does not provide any information besides the rhyme part of a syllable. There is no information about the initials. The possible dialectal

differences are additional variables that need to be carefully handled. In comparison with rhyming materials, the ancient non-Chinese scripts can provide better phonological information with a low noise ratio. It is hoped that this study will yield a better understanding of the forms of early Mandarin phonology.

7.1.1 Mandarin Characteristics

Mandarin is the name of the largest dialect group of modern Chinese, with more than 800 million native speakers and the Beijing subdialect serving as the national standard, whose phonological characteristics are clearly described. In the synchronic classification of modern Chinese dialects, both conservative and innovative features are equally important if they can be used to distinguish different dialects, but in search of the early history of Mandarin the characters chosen for our analyses, they must be innovative ones. Only innovative characteristics can tell us about the chronological changes that formed Mandarin.

In the tradition of Chinese dialectology, Chinese dialects are classified based on their phonological characteristics. The characteristics listed here are historical developments from Middle Chinese (MC) as represented by *Qieyun* (601 CE). These phonological characteristics are chosen based on the following criteria: (a) present in modern Beijing Mandarin, (b) are sufficient to distinguish Mandarin from other dialects, (c) are innovative, and (d) have characteristics that can be examined in the available Altaic materials.

1. Diphthongization of the MC syllables with coda * -k
2. Devoicing of the MC voiced obstruents
3. Labiodentalization of the MC bilabial initials
4. Loss of the MC stop codas * -p, * -t, * -k

7.1.2 The Phonological Characteristics of Northern Mandarin

The Mandarin-speaking area is vast, and technically standard Mandarin is just one of the many subdialects. As proposed by Li (1985), subdialects of Mandarin can be determined by the development of the MC *ru* 'entering' tone. Based on this criterion, he divided Mandarin into seven subdialects. However, this phonological development is difficult to detect from the materials written in the scripts of the atonal Altaic languages. In general, tonal difference is not marked. Thus we need to find a nontonal characteristic that can represent Northern Mandarin.² For this purpose we identify the diphthongization of MC -k syllables, especially the syllables from the MC *dang* 宕 and *jiang* 江 rhyme groups, as a diagnostic feature.

This particular phonological characteristic is mainly preserved in the colloquial readings of two subdialects of Mandarin, Beijing Mandarin (Beijing Daxue 2003) and Northeastern Mandarin (Gao 2009) but not in the other subdialects.

| | | | | | | | |
|------|-------|------|-----|-----|-----|-----|-----------------|
| MC | BJ | JN | XA | WH | CD | HE | YZ ³ |
| *-ak | aw | -ɣ | -o | -o | -o | -eʔ | -aʔ |
| 药 | *-jak | -jaw | -ye | -yo | -io | -yo | -yeʔ -iaʔ |

The characteristic can commonly be found in localities within Beijing and the Northeastern Mandarin speaking areas. Usually the rural areas preserve this characteristic better than the urban areas (Liu 2000).⁴

| | | | | | | | | | |
|----|-------|-------|------|------|------|--------------|------------------|--|--|
| | | Hebei | | | | Northeastern | | | |
| MC | BJ | WC | YT | SP | JZ | CC | HRB ⁵ | | |
| 薄 | *-ak | -aw | -au | -au | -au | -au | -au | | |
| 药 | *-jak | -jaw | -iau | -iau | -iau | -iau | -iau | | |

This geographical distribution should be understood as a general feature of Northern Mandarin reflecting a historical layer, although this assumption is based on modern dialects. In order to know the status of the changes in various historical stages, we must examine all the phonological characteristics.

7.2 THE KHITAN LESSER SCRIPT OF LIAO

The Khitan people were the nomads of the North, and by the 10th century CE they had established the Liao Dynasty with its ruling areas including eastern Mongolia, most of Manchuria and northern China as well as the area of modern Beijing, which was the location of the south capital of Liao (Beijing became a capital for the first time). Soon after the establishment of Liao, the Khitans invented two functionally distinct scripts, *Qidan Dazi* 契丹大字 'Khitan Greater Script' and *Qidan Xiaozì* 契丹小字 'Khitan Lesser Script', for the Khitan language. The Lesser Script is phonetic; its writing unit is morphemic with one to seven basic graphs, *yuanzi* 原字 'basic graph' (YZ).

The texts written in the Lesser Script remain basically unreadable, although many Chinese proper nouns such as official titles, place names, and personal names have been deciphered with a high degree of confidence. In Chinggelai et al.'s *Qidan Xiaozì Yanjiu* 契丹小字研究 (The Studies of the Khitan Lesser Script) of 1985, a table lists the reconstructed phonetic values of ninety-eight YZ graphs. This table represents a significant step in the decipherment of Chinese words, but it is unfortunate that the decipherment is done in a rather sporadic way and clearly lacks a systematic treatment. The same

reconstructed values are used in Chinggel'tai et al.'s *Qidan Xiaozì Shidu Wenti* 契丹小字释读问题 (Issues of the Decipherment of the Khitan Lesser Script) of 2002, in which he examines the reconstructions by various scholars. Efforts in analyzing all the YZ graphs systematically (Shen 2007) led to the realization that the Chinese loans actually form a phonological system of Sino-Khitan. The basic characteristics of Sino-Khitan phonology unambiguously show that the Chinese spoken in the territory of Liao was clearly Mandarin.

7.2.1 Diphthongization

The Khitan spellings of the Chinese loanwords show the diphthongization. The finals of MC *ru* syllables with -k, 洛 and 药 are transcribed as *awu by Khitan YZ 31 and 28 (the YZ number is according to Chinggel'tai et al. 1985).

洛 *l₁aw.u -dk > -aw *Luojing Liushou* 洛京留守 'Luojing Regent'
药 *j₁aw.u -j₁ak > -aw *Yaoshi Nu* 药师奴 'personal name'

Khitan YZ 31 is also used to transcribe the MC non-*ru* syllables with a -w coda, such as 高, 曹, 少, and Khitan YZ 28 is used to transcribe the MC syllables with vowel u, such as 五, 部, 奴. Such a parallelism is possible only if the MC syllables with a -k coda is changed into a diphthong -aw.

The following is still another example of diphthongization. The final of 国, which is a *ru* syllable with a -k coda in the MC system, is transcribed by YZ 19. YZ 19 is also used to transcribe 水, which has no stop coda according to the MC system.

国 *k₁uj -wak > -uj *Yueguo Wang* 越国王 'King of the Yue State'
水 *j₁uj -wi > -uj *Qishui Xian* 漆水县 'County of Qishui'

7.2.2 Devoicing

The Khitan material shows that MC voiced obstruents have devoiced. The change is consistent with the modern Mandarin pattern, aspirated in *ping* 'level' tone syllables and unaspirated in *ze* 'oblique' tone syllables.

都 *tu t- > t- *Dujian* 都监 'Director-in-chief'
度 *tu d- > t- *Jiedushi* 节度使 'Military Commissioner'
徒 *thu d- > t^h *Situ* 司徒 'Minister of Education'

In the MC system, both 度 and 徒 have a voiced stop initial *d-. Since 度 is a *ze* tone syllable it is transcribed as *tu* by Khitan YZ 68, the same as 都, which has a voiceless

unaspirated stop initial *t- in the MC system. On the other hand, the initial of the *ping* tone syllable 徒 changed to aspirated stop *t^h-, which is transcribed by Khitan YZ 38. Thus the Khitan material evidences the early occurrence of the Mandarin devoicing process.

7.2.3 Labiodentalization

YZ 36 is used to represent syllable [fu] in Chinese. But the MC syllable [fu] is generally taken to be either an aspirated stop or a homorganic labial vowel [p^hu] in Khitan. YZ 36 is basically used alone to transcribe Chinese syllable [fu] and sometimes is used as an initial with other YZ graphs.

府 *p^hu p- > f- *Shuafu Fushuai* 率府副率 'Vice Commandant of Guard Command'
副 *p^hu p^h- > f- *Fu Bushu* 副部署 'Vice Area Commander'
駙 *p^hu b- > f- *Fuma* 駙马 'male imperial-in-law'

7.2.4 Loss of Stop Codas

The MC stop codas of *ru* syllables, syllables with -k coda presented in above, are lost. The following are more examples with phonetic values of YZ 7, 68, and 39 that have *i*, *tu*, and *a*, respectively. There is no coda.

密 *m₁i -Vt > -i *Shunmiyuan* 枢密院 'Palace Secretariat'
督 *tu -Vk > -u *Dujun* 督军 'Army Commander'
腊 *l₁a -Vp > -a *La Yue* 腊月 'the 12th month of the lunar year'

Because of the presence of these innovative characteristics, Mandarin phonology was established by the time of Liao. There are many similarities between the Liao Chinese and Shao Yong's 邵雍 (1011–1077) *Shengyin Changhe Tu* 声音唱和图, which is a set of phonological tables in his *Huangji Jingshi Shu* 皇极经世书. In these tables he tried to use phonological categories to explain his philosophical ideas. In the *Shengyin Changhe Tu* MC syllables with -k coda 岳, 霍, 六, 玉, 德, and 北 are listed in the same table with syllables with -w coda 刀, 早, 毛, 报, 牛, 斗, 龟, and 水. Diphthongization of MC syllables with -k is a diagnostic characteristic of Northern Mandarin (Jaxontov 1980), so it is likely that Shao Yong made these tables according to his native dialect of Fanyang, which is about 50 kilometers south of Beijing within the territory of Liao.

Modern Beijing Mandarin inherited all these basic characteristics from Liao Mandarin, and these basic characteristics can be demonstrated in the Altaic scripts of the two succeeding dynasties, Jin and Yuan.

7.3 THE JURCHEN SCRIPT OF JIN

The Jurchens, a Tungusic people and ancestors of the later Manchus, defeated the Khitans in a seven-year war (1115–1122 CE) through an alliance with the Northern Song Chinese. The Jurches pushed the southern boundary with Song further south to the Huai He. According to the *Jin Shi* 金史 two scripts were invented by the Jurches: the *Nüzhen Dazi* 女真大字 'Jurchen Greater Script' and the *Nüzhen Xiaozì* 女真小字 'Jurchen Lesser Script' (Sun 2004). Unlike the Khitan scripts, no real example has been found to distinguish between the two languages. Functionally speaking, all the Jurchen writing examples (Jin and Jin 1980; Dorji and Qosiyu 1984) are more similar to the Khitan Greater Script, which is a logographic system representing units of meaning.

In the study of the Jurchen language, the main material used by Jurchenologists is the so-called *Nüzhen Yiyu* 女真译语 (NZYY), which is actually the *Nüzhen* section of the *Hua Yi Yiyu* 华夷译语 compiled in the Ming dynasty (1368–1644). For the purpose of studying the Chinese phonology of the Jin dynasty, however, the NZYY is not very reliable because it was produced centuries later in time. The phonological information is very likely from the languages of the Ming dynasty.⁶ It is evident that the Jurchen characters are basic writing units and cannot be further divided into structurally smaller components, but there is no question that in Chinese transcriptions of Jurchen characters represent phonetic values only. In the Jurchen script all the basic phonological characteristics found in the Khitan materials are present, although only a few examples are available because Chinese words written in the Jurchen script are very limited.

7.3.1 Diphthongization

Only a few *kaikon* syllables⁷ from MC *zeng* 曾 and *geng* 梗 rhyme groups can be found, and they show the forms of diphthongization. 策 is a MC division I syllable with a -k coda. The second character in the spelling is the same one used for 楷, which is a MC division II syllable with -j coda. Jurchen character 219 (the character number is according to Jin and Jin 1980) therefore represents the phonetic value aj, making the pronunciation of 策 a diphthong.

策 *tʃa:aj -Vk > -aj ce 策 'document'
 哀 *aj -j ai 哀 'sorrow', from the NZYY⁸

A parallel *hekou* is 国, which is also a MC division I syllable with -k. The second Jurchen character in the spelling is character 106, which is transcribed by Chinese character 贵 in the NZYY. 贵 is a MC division III syllable with no coda.

国 *kuj -Vk > -uj *Jianxū Guoshǐ* 兼修国史 'Concurrent Compiler of
 Dynasty History'
 贵 *kuj -i *guì* 贵 'precious', from the NZYY

7.3.2 Devoicing

A comparison of the spelling of three Chinese characters 同, 通, and 东, provides the best indication of the initial consonant of [t]ʰ's change into a voiceless aspirated stop. In the MC system, the initials of 同, 通, and 东 are voiced, voiceless aspirated, and voiceless unaspirated, respectively. After devoicing of the voiced initials, the initial of 同 changed to voiceless aspirated because 同 is a *ping* tone syllable. So in the Jurchen spellings both 同 and 通 are transcribed by using Jurchen character 113 *tʰu. In contrast, the initial of 东 is transcribed by Jurchen character 13 *tu.

同 *tʰuŋ d- > tʰ- *Tongzhi* 同知 'Associate Administrator'
 通 *tʰuŋ tʰ- > tʰ- *Tongfeng Dafu* 通奉大夫 'Grand Master for
 Thorough Service'
 东 *tuŋ t- > t- *Dongpingfu* 东平府 'Dongping Superior
 Prefecture'

7.3.3 Labiodentalization

Jurchen letter 410 is used to transcribe an MC voiceless unaspirated stop in syllables 傅, 府 and a voiced stop in syllables 凤, 奉. There is no distinction of initial consonants, which could have been distinguished if they were not merged. Also, they are all division III syllables; none indicates the existence of a palatal medial, a distinctive feature of division III syllables. So there is no question that this graph transcribes the syllables with labiodental fricative f- in Chinese. In other words, labiodental initials were in existence in the Chinese spoken in the Jin territory.

凤 *pʰu- b- > f- *Danfeng Men* 丹凤门 'Gate of Red-phoenix'
 奉 *pʰu- b- > f- *Tongfeng Dafu* 通奉大夫 'Grand Master for
 Thorough Service'
 傅 *pʰu p- > f- *Yingwang Fu* 英王傅 'Mentor of Prince Ying'
 府 *pʰu p- > f- *Daming Fu* 大名府 'Daming Superior Prefecture'

7.3.4 Loss of Stop Codas

Not many examples can be found in addition to the **-k* syllables in 3.1, which indicate the loss of coda. No example with **-p* or **-t* can be found. The following is the example of MC *-k* syllable.

卜 **pu* -*Vk* > -*u* *Bu Xiuhong* 卜修洪 ‘personal name’
 部 **pu* -*u* > -*u* *Libu Shiliang* 礼部侍郎 ‘Vice Minister of Ministry of Rites’

That the MC *ru* syllable 卜 and non-*ru* syllable 部 are transcribed by the same Jurchen character 459 is an indication of the loss of *-k*.

7.4 THE HP'AGS-PA SCRIPT OF YUAN

Yuan Dynasty was founded by the Mongolian leader Kublai Khan, who ruled most of present-day China as well as all of the modern Mongolia and its surrounding areas from 1271 to 1368. In 1272 Yuan moved its capital to the area of modern Beijing, known then as *Dadu* 大都. Because of the location of the capital, Northern Mandarin as a national standard was further confirmed.

The so-called hP'ags-pa script was invented early in the Yuan dynasty as a national script and later named after its inventor Lama hP'ags-pa (1235–1280), a Tibetan scholar and religious leader. His official title in the Mongol empire was *guoshi* 国师 ‘national preceptor’ and later *dishi* 帝师 ‘imperial preceptor’. The script was invented under the command of Qubilai Khan in the first year of the *Zhongtong* reign (1260) according to *Yianshi*. This script was based on the Tibetan script with additional letters. The similarity between the two scripts is so obvious that the hP'ags-pa script should be considered as a variation of the Tibetan script.

The well-known *Menggu Ziyun* 蒙古字韵 (MGZY) was an effort by the Yuan court to provide an orthography for Chinese in the newly invented script. Although it is arranged in the traditional rhyme book format,⁹ its main function is orthographic. The publication date of the MGZY is not found in the book itself. The only surviving copy is a modified version by Zhu Zongwen 朱宗文 (Junast and Yang 1987). The year of 1308 was mentioned in the preface by Zhu, but it is likely that this work was produced in the early Yuan Dynasty shortly after the invention of the hP'ags-pa script. The hP'ags-pa steles, in which Chinese spellings are already in the standard forms of the MGZY, appear in the 1270s CE. So the phonological information of the MGZY is about a century earlier than the ZYYY, although both are referred to as Yuan rhyme books.

To a modern Chinese historical phonologist, the significance of this material is that for the first time Chinese was systematically transcribed into an alphabetic system.

Transcriptions of Chinese in foreign alphabets existed before the MGZY, but none of them can match the comprehensiveness of the MGZY. For the first time, an entire phonology was transcribed into an alphabetical system, meaning there is no need to reconstruct the phonetic values. Individual sounds and syllables are spelled out clearly in a most systematic way.

7.4.1 Diphthongization

MC *-k* syllables in the MGZY display a variety of diphthong and monophthong reflexes. Because of the advantage of hP'ags-pa spelling, the phonetic values of these reflexes can be obtained without going through reconstruction. The different diphthong reflexes are determined by the nuclear vowel of the MC *-k* syllables prior to this change. If the nuclear vowel is a back vowel, it realizes as a diphthong with coda *-w*, and if the vowel is a non-back vowel, it realizes as a diphthong with coda *-j* (Shen 2005, 2008).

| | |
|--------------|----------------|
| 各 -ak > -aw | 觉 -uqaw > -jaw |
| 脚 -jak > -ew | 郭 -wak > -waw |
| 摘 -ek > -aj | 隔 -uqek > -jaj |
| 德 -ek > -ej | 国 -wak > -uj |

MC *-k* syllables are also in monophthong forms. These monophthongs should be analyzed in the same way as the diphthongs, but due to the surface form restriction they appear as monophthongs instead (Shen 2005).

7.4.2 Devoicing

In the MGZY, the tripartite distinction of the MC obstruents is artificially preserved. This is due to the adaptation of a phonological framework *Qiyin Lue* 七音略, which employed the traditional initial system of thirty-six letters among other conservative characteristics. Since there were two types of obstruents in the real language, the voiceless unaspirated and voiced obstruents were represented by the wrong letters according to the Tibetan equivalents (Shen 2008:112–116).

| | |
|------|---------------------|
| | 帮 滂 旁 当 汤 唐 |
| MC | p- pʰ- b- t- tʰ- d- |
| MGZY | b- pʰ- p- d- tʰ- t- |

This interesting voicing flip-flop actually indicates devoicing in the language and the conservative character of the phonological framework.

7.4.3 Labiodentalization

The labiodental fricatives are spelled with digraph letters based on letter *h*- and letter *-w*-. The MC voiceless initial *fei* 非 *p*- and *fu* 敷 *ph*- initials are merged and spelled with *f*- and the voiced initial *feng* 奉 **b*- is spelled with *v*- in the *hP*'ags-*pa* spellings.

风 *p*- > *f*- = 丰 *ph*- > *f*-, 逢 *b*- > *v*-
非 *p*- > *f*- = 妃 *ph*- > *f*-, 肥 *b*- > *v*-

In the spellings the voiceless and voiced fricatives are not well distinguished and are sometimes reversed (Shen 2008:92-96).¹⁰ This phenomenon also shows that a voicing contrast did not exist in the language but was artificially made; however, the phenomenon of labiodentalization is evident.

7.4.4 Loss of MC Stop Codas -p, -t, -k

There is no stop coda indicated in the *hP*'ags-*pa* spellings because MC *-p*-, *-t*-, and *-k* syllables became homophones, and segmental elements are the same as non-*-ru* syllables.

立 *-p* li = 栗 *-t* li = 力 *-k* li = 利 *-i* li

In the MGZY the *ru* tone is distinguished from the other three tones. This is another conservative characteristic of the phonological system that the MGZY adopted.

7.5 SUMMARY

The Altaic scripts provide unambiguous evidence that Mandarin phonology can be traced to the Liao Dynasty. This Northern Mandarin phonology became a new standard for the entire country in the Yuan Dynasty. In the modern Beijing dialect, many MC syllables with *-k* coda, such as 剥, 削, 伯, and 得, have dual pronunciations: *bāo*, *xiào*, *bāi*, *déi*, and *bō*, *xuē*, *bá*, *dé*, respectively. The former in diphthong form has a history of at least 1,000 years. These pronunciations are directly inherited from northern Chinese spoken in the time and location of the Liao Dynasty, if not earlier. The latter is likely from the central plain area during the Jin-Yuan time when the boundary between the Altaic and Han ruling areas moved south.

As we know, the phonological standard of the Song dynasty (960-1279) was in the tradition of the *Qieyun*. Its revisions, the imperial *Guangyun* 广韵 and *Jiyun* 集韵, were published in 1008 and 1037 as the standard for poetry composition in imperial examinations. During the same period, the characteristics of Northern Mandarin phonology

were established in the territory of Liao. This new standard gradually gained its prestigious status in the ruling areas of the Khitans, the Jurchens, and the Mongols. Therefore, the publication of ZYYY was the recognition of the new standard and therefore should not be regarded as its beginning point.

| | MC | Liao | Jin | Yuan | Yuan | Modern |
|--------------------|---------------|--------|---------|------|------|---------|
| | <i>Qieyun</i> | Khitan | Jurchen | MGZY | ZYYY | Beijing |
| Diphthongization | - | + | + | + | + | + |
| Devoicing | - | + | + | + | + | + |
| Labiodentalization | - | + | + | + | + | + |
| Loss of stop coda | - | + | + | + | + | + |

That Mandarin originated in the territories of Liao and Jin has been speculated by a number of Chinese linguists (Lin 1987; Norman 1997/2004). Now the speculations of the origin of Mandarin can be firmly substantiated with linguistic evidence.

It is also worth noting that the early history of Mandarin as seen from the Altaic scripts suggests that the basic phonological features are usually very stable. A phonological system exists for a long period of time without much change. Unless extraordinary events violently disturb the linguistic stability, the phonological system will maintain its basic characteristics.

NOTES

1. Of the five capitals of the Liao Dynasty, the south capital was located in the modern Beijing area. The Jin Dynasty moved its capital to Yanjing (modern Beijing) in 1153 CE. The location of the Yuan capital, Dadu 大都, was in the area of modern Beijing.
2. Unless specified, we use Northern Mandarin to refer to Northern and Northeastern Mandarin, including the Beijing dialect, in this article.
3. BJ = Beijing, JN = Jinán, XA = Xiān, WH = Wúhàn, CD = Chéngdū, HF = Héféi, YZ = Yangzhōu.
4. It should be noted that the data from different publications may have different transcription conversions for the same phonetic values.
5. BJ = Běijīng, WC = Wéichāng, YT = Yùtián, SP = Shūnpíng, JZ = Jīnzhōu, CC = Chángchūn, HRB = Hāěrbīn.
6. No MC *ru* syllable with low and back vowels is found in the available material. But the evidence of diphthongization of MC *ru* syllables with a *-w* coda can be found in the rhyming of the *zhugongdiao* (a form of storytelling and singing literature) of the Jin Dynasty. In the *Zhugongdiao of Liu Zhiyuan* 刘知远诸宫调 and Dong Xieyuan's 董解元 *Zhugongdiao of Xixiang Ji* 西厢记诸宫调, MC *ru* syllables with *-k* rhyme with the syllables that originally have a *-w* coda. This is the same change found in the Khitan material and later in a systematic way in the Yuan rhyme books. In the twelfth part of the *Zhugongdiao of Liu Zhiyuan*, the MC *-k* word 学 rhymes with words with *-w* coda 闹, 道, 到, 膠, 宝, 恹, and 老. In the second volume of Dong Xieyuan's *Zhugongdiao of Xixiang Ji*, the MC *-k* words 壳, 落, 度,

- and 著 are in rhyme with MC-*w* words 道, 熬, 了, 叫, 要, 搅, 告, 逃, 剿, 靠, 恼, 孝, 了, 表, 条. So in the Jin Dynasty the diphthongization of MC-*k* syllables have the same change pattern as that found in the Khitan materials.
7. According to the tradition of rhyme tables, the MC syllables are classified as either *kaikou* or *hekou*. The main vowel of *kaikou* syllables is unrounded and not preceded by medial *w*, such as *i*, *e*, *a*, but the main vowel of *hekou* syllables is either rounded, such as *u*, *o*, or preceded by medial *w*, such as *wa*, *we*.
 8. Two available versions are referred to as the *Yongle* version 永乐本 and the *Huitong Guan* version 会同馆本 (Jin and Jin 1980; Kane 1989). The *Yongle* version has the Jurchen characters in the *Zazi* 杂字 part and the *Huitong Guan* version does not have any Jurchen characters.
 9. The evidence suggests that three steps were taken to compile the MGZY in the following order: (a) an existing phonological system was adopted. This phonological system was probably that of the *Qiyin Yun* 七音韵, a lost text mentioned in the *Gujin Yunhui Juyao* 古今韵会举要 (Yang 1989; Ning 1997).
 10. The exact letters used for the three bilabial fricatives are very confusing in the only surviving copy of the MGZY. But they can be restored based on the order of the initials listed in the MGZY.

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PART 2

.....
LANGUAGES AND
DIALECTS
.....

CHAPTER 8

AUSTRIC LANGUAGES

BAOYA CHEN AND ZIHE LI

8.1 WHY AUSTRIC

The main reason to put Kam-Tai, Austronesian, and Austroasiatic into a superfamily is that these three groups share many basic words. If the hypothesis of the Austric phylum is true, it might provide some evidences to support the Out-of-Africa hypothesis that the Asian people came to Asia through two routes: north of Himalaya and south of Himalaya. If this hypothesis is not true, the Austric languages would provide solid evidence to challenge the historical comparative method that groups different languages into a genetic family according to the correspondences of cognates. This is one important reason why so many scholars are interested in the Austric.

Due to the profound influence from Chinese, many Austric-speaking people in China are becoming bilingual or multilingual. Some have even undergone a language shift to speak more than a variety of Chinese, endangering the very existence of many Austric languages in China.

This chapter focuses on Kam-Tai and Austroasiatic languages with a brief introduction to Huihui language in Hainan that is typologically different from those in Taiwan.

8.2 KAM-TAI LANGUAGES

Kam-Tai languages are spoken by the descendants of several ethnic groups that have a common name, “Baiyue” (百越, Hundred Yues) in ancient China. “Kam” is an autonym of the Dong Nationality in China, while “Tai” is another autonym of several ethnic groups speaking the languages of this branch.

Kam-Tai languages are distributed from Hainan Island in the east to Assam, India, in the west. There are also Kam-Tai speakers living in Vietnam, Laos, Thailand, and

Myanmar. In China, Kam-Tai languages are distributed across the southern provinces, including Guangdong, Guangxi, Guizhou, Hunan, and Yunnan, forming a crescent-like area stretching for several thousand kilometers.

Li Fang-Kuei (1977), in his early fieldwork, divided Kam-Tai languages in China into a Tai branch and a Kam-Sui branch. These two branches include the following languages:

- (1) Tai branch, which can be further divided into three groups:
 - a. Northern group: northern dialects of Zhuang, Buyi
 - b. Central group: southern dialects of Zhuang
 - c. Southwestern group: Shan (across the border of Myanmar and China) and Dai in Yunnan
- (2) Kam-Sui branch, which can be further divided into two groups:
 - a. Kam group: Dong, Mulao, and Lajia
 - b. Sui group: Sui, Maonan, Yanghuang, and Mo

Luo Changpei and Fu Maoji (1954) added the Li branch as the third branch that includes Li and Cunjua. Liang Min and Zhang Junru (1996) added another branch, Geyang, as the fourth branch, including languages like Gelaο, Laki, Pubiao, Buyang, Jing, and Yanghuang.

The most important phonological feature that characterizes Kam-Tai languages is that all these languages have phonemic tones. All Kam-Tai languages have phonemic contrasts in vowel lengths as well. So [a] and [a:] are two different phonemes. For example, in Longchow Zhuang there are several minimal pairs contrasting short and long vowels (examples from Li 1940:223–286):

| | | | |
|--------|------------------|--------|-----------------------|
| da:ɿ33 | “empty, in vain” | daɿ33 | “good” |
| ka:u24 | “to stir” | kaɿ24 | “nine” |
| ka:m33 | “sweet” | ka:m33 | “to hold in the hand” |
| ka:n24 | “to hasten” | kan24 | “handle” |
| daŋ33 | “body” | daŋ33 | “to make fire” |
| ja:p55 | “course, rough” | ja:p55 | “a moment” |
| ha:t55 | “rapids” | ha:t55 | “hail” |
| ja:k55 | “hungry” | ja:k55 | “to dig into” |

Generally speaking, a Kam-Tai language has eight syllable endings, forming a symmetrical ending system:

| | | |
|------|----|----|
| (-∅) | -i | -u |
| -m | -n | -ŋ |
| -p | -t | -k |

The following examples are from Longchow Zhuang (Li 1940:223–286):

| | | | | | |
|--------|------------|--------|------------------------|--------|----------------------|
| ta21 | “to smear” | taɿ21 | “hoof” | tau21 | “but” |
| ta:m55 | “to weave” | kan31 | “bank (of a river)” | taŋ24 | “to erect” |
| ta:p55 | “liver” | ta:t55 | “to cut with scissors” | ta:k55 | “to draw up (water)” |

Most Kam-Tai languages have a few sets of complex initials, including preglottalized voiced initials ?b-, ?d- (some languages even have phonemic ?j-, ?w-, ?m-, ?n-, ?ŋ-), palatalized initials (with -j-), and labialized velar initials kw-, jw-.

Maonan has a complete set of preglottalized initials (Wang et al. 1984:603):

| | |
|----------|--------------------------|
| ?mai | “vegetable” |
| van ?na3 | “the day after tomorrow” |
| ?na:ŋ5 | “stupid” |
| ?wa5 | “dirty” |
| ?ja5 | “farmland” |

Luocheng Mulao is rich in palatalized initials and labialized velars (Wang et al. 1984:417):

| | | | | | |
|-----|-----|------|-----|-----|------|
| pj | fj | tsj | pw | ʈw | tsw |
| phj | thj | tshj | phw | ʈhw | tshw |

Although the phonemic inventory of some Kam-Tai languages is rather large, languages of this group all have simple syllable structures: C(consonant) + G(glide) + V(vowel) + C or V + T(tone). Only a few languages have consonant clusters as initials, and only three clusters have been found: Cl-, Cr-, Cy-. For example, the word for “near” is “phyei5” in Mulao, and “plau3” in Li.

Classifiers abound in all Kam-Tai languages. They are compulsory in phrases containing numbers. But the position of classifiers varies among languages. In some languages, when the unit for a given noun is “one,” the noun occurs between a classifier and the numeral

Longchow Zhuang (Li 1940:39, 177):

| | | | | | |
|-------------|-----------|-------|--------------|-------------|-----------|
| po:11 | luk2a:u55 | naŋ33 | ʃa:m33 | po:11 | luk2a:u55 |
| CL (person) | son | one | three | CL (person) | son |
| “one son” | | | “three sons” | | |

Dehong Dai (Chen 2012):

| | | | | | |
|--------------|-------------|------|----------------|-------|-------------|
| kon2 | ka:4 | lay6 | kon2 | sa:m1 | ka:4 |
| man | CL (person) | one | man | three | CL (person) |
| “one person” | | | “three people” | | |

The constituent orders of Kam-Tai languages are more or less the same. Their sentences always have the verb follow the subject and the object follow the verb. For example:

Dehong Dai (Chen 2012):

xau1 thain1 la2
they plough farmland
“They plough the farmland.”

Dong (Wang et al. 1984:382):

ta6ma:u6 tun1 ka3 ta:u1 lam1' ja5
3pl. pull seedling 1pl. transplant field
“They pull up seedlings; we transplant in the field.”

Li (Wang et al. 1984:745):

pha3tau3 tu:ŋ2 pha3gu:ŋ1 la2 fau3 hom1 tsho:mi
elder brother give younger brother two CL fruit
“The elder brother gives the younger brother two fruits.”

The typological features of Kam-Tai languages can be summarized as follows:

- Analytical.
- Monosyllabic. The maximum syllable is CCGVV/CT; tone is compulsory for all content words.
- Compounding is a major morphological device.
- The constituent orders are: Subject + Verb + Object, Head + Modifiers.
- Rich in classifiers.

Table 8.1 Examples of correspondence sets between Chinese and Kam-Tai languages

| Gloss | Character | Old Chinese | Reconstructed Proto-Tai |
|-----------|-----------|-------------|-------------------------|
| fat | 肥 | *bwi:ai2 | *bi:2 |
| white | 白 | *brak8 | *phuek7 |
| bird | 鸟 | *tiau3 | *ni//ok8 |
| to arrive | 到 | *tau5 | *tau3 |
| cold | 冷 | *t'reng4 | *ʔdang3 |
| man | 子 | *tsja3 | *d'ai2 |
| dry | 燥 | *sau3 | *ew5 |
| two | 双 | *c'rong1 | *s'ungŋ1 |
| to drink | 啜 | *z'wja:t7 | *zot8 |
| two | 二 | *ŋjei6 | *ŋi6 |
| meat | 肉 | *ŋwjauk8 | *nuw4 |
| hot | 热 | *ŋja:t8 | *nuai9 |
| sun | 日 | *ŋje:t8 | *ʔdi//re:t9 |
| horn | 角 | *krok7 | *k'hou1 |
| neck | 喉 | *yo2 | *yo2 |
| one | 一 | *ʔjet7 | *ʔre:t7 |

All these features resemble Chinese (or some of its dialects) so much that Li Fang-Kuei proposed that Kam-Tai languages are genetically related to Chinese (Li 1937). Many Chinese scholars hold the same view. Correspondence sets between Chinese and Kam-Tai languages can be easily found (Chen 2012). See Table 8.1.

However, in 1942 Benedict proposed that Kam-Tai languages are genetically related to Austronesian languages because there are even more correspondence sets in the basic vocabulary involving Austronesian cognates. More Chinese linguists are now agreeing with Benedict (Ni Dabai 1990; Chen Baoya 1996, 2002, 2007). In recent years there has been increasing evidence showing that Kam-Tai languages in Southwest China may be truly related to Austronesian languages. However, more convincing arguments about the genetic affiliation of Kam-Tai languages still awaits in-depth research.

8.3 AUSTROASIATIC LANGUAGES

There are many correspondence sets between Kam-Tai and Austroasiatic languages (see Table 8.2; Chen 1997). That explains why many scholars, such as Benedict (1942), used to relate the two groups genetically.

Austroasiatic languages are distributed across Southeast Asia, separated by areas where Kam-Tai, Austronesian, Tibetan-Burma, and Chinese are spoken. There are more than 120 languages spoken there. In China, speakers of Austroasiatic languages are scattered in Guangxi and Yunnan, belonging to the nationalities of Wa, De'ang, Blang, and Jing.

The Austroasiatic language family can be divided into four major subfamilies (Yan and Zhou 1995:104):

Table 8.2 Examples of correspondence sets between Kam-Tai and Austroasiatic languages

| Gloss | Proto-Tai | Southwestern-Tai | Central-Tai | Northern-Tai | Wa |
|------------|-----------|------------------|-------------|--------------|-------|
| face | *hna3 | naa3 | na3 | naa3 | na |
| grass | *hŋa3 | jaa3 | jaa3 | ji:3 | ŋa |
| farmland | *na2 | naa2 | naa2 | naa2 | na |
| ivory | *ga2 | ŋaa2 | ŋa2 | ŋaa2 | ŋa |
| five | *ha3 | haa3 | haa3 | haa2 | hŋ |
| late | *hia3 | laa3 | laa3 | kwaai2 | lhŋ |
| to immerse | *hma5 | maas | ma5 | maas | s-mŋa |
| quilt | *pha3 | phaa3 | fa2 | putuw6 | pha |
| to cut | *pha5 | phaa5 | pho5 | pa5 | phŋ |

Note: Southwestern Tai is represented by Thai; Central Tai is represented by Longchou Zhuang; Northern Tai is represented by Po-ai. Wa is the representative of Austroasiatic languages.

- (1) Mon-Khmer, consisting of eighty-one languages such as the Wa-De'ang branch like Wa, De'ang and Blang, spoken in China
- (2) Viet-Muong, consisting of nine languages such as Jing (Viet-Moungic branch), Balu (Baliuic branch), and Mang (Mangic branch)
- (3) Munda, consisting of nineteen languages
- (4) Nicobarese, consisting of eleven languages

Unlike neighboring Kam-Tai languages, Austroasiatic languages in China are mostly toneless as those outside China. For example, De'ang and Wa do not have phonemic tones. Some Austroasiatic languages in China do have tones, but the development of tones differs from one language to another. Jing has eight tones that apparently correspond to the neighboring Cantonese. Therefore, it is fair to infer that Jing tones are derived from language contact with Chinese (Ouyang et al. 1984:33). See Table 8.3. There is no tone 4 because tone 4 has merged with tone 3.

However, Blang has four tones that seem to have resulted from spontaneous tonogenesis (Li et al. 1986:14). See Table 8.4.

All Austroasiatic languages have a large inventory of finals. For example, Blang has 150 finals and De'ang has 185. One reason for the abundance of finals is that they distinguish tense and lax vowels. The vowel inventory of Wa clearly illustrates a complete set of tense/lax contrast (Zhou and Yan 1984:7). See Table 8.5.

Table 8.3 Examples of tonal correspondence between Chinese and Jing

| Middle Chinese Tonal Categories | Middle Chinese Initial | Jing Tonal Categories | Example |
|---------------------------------|----------------------------------|---|---|
| Ping | voiceless voiced and sonorant | 1 1 when initials are m, n, ŋ, v, l, j | tun1 "middle" na:n1 "south" ba:12 "card" |
| Shang | voiceless voiced and sonorant | 2 3(4) | ja:i3 "to untie" mo:i3 "every" ja:u5 "to teach" |
| Ou | voiceless voiced and sonorant | 5 6 | ja:u5 "to teach" niam6 "to read" |
| Ru | voiceless voiced and sonorant | 7 8 | fa:t7 "hair" fa:t8 "to punish" |

Table 8.4 Four tonal categories of Blang

| Tone | Examples | |
|------|---------------------|-----------------------------|
| 35 | tan1 "to support" | ka?1 "fish" |
| 33 | tan2 "to carry" | ka?2 "to handle" |
| 331 | tan3 "to step over" | ka?3 particle |
| 21 | tan4 xik1 "all" | khau?4 ka?4 "rice seedling" |

Table 8.5 Tense/lax contrast in Wa vowels

| Lax vowel | Meaning | Tense vowel | Meaning |
|-----------|--------------|-------------|--------------|
| pi | "to forget" | pi | "mouth harp" |
| pe? | "goat" | pe? | "you [p, l]" |
| e | "to shield" | te | "sweet" |
| ka | "to bite" | ta | "to roast" |
| po | "not" | pe | "waist" |
| mo | "to crumble" | pe | "mortar" |
| pu | "thick" | pu | "to fly" |
| ry | "boat" | ry | "to drag" |
| bu | "oil" | bu | "ear ring" |

Therefore, Wa has a large vowel system consisting of eighteen vocalic phonemes. The cases of other Austroasiatic languages are similar. These vowels may combine to form diphthongs and triphthongs. In Wa, there are twenty-eight diphthongs and four triphthongs (Zhou and Yan 1984:8):

Diphthongs:

| | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|
| ie | ia | io | iu | ea | ai | au | aw | oi | ui | ua | yi | ui |
| ie | ia | io | iu | ea | ai | au | aw | oi | ui | ua | yi | ui |

Triphthongs:

| | |
|-----|-----|
| iau | uai |
| iau | uai |

All these diphthongs and triphthongs can serve as the nucleus of finals. Other Austroasiatic languages have similar complex finals.

Almost all Austroasiatic languages in China have large sets of consonantal endings. For example in Blang there are ten consonantal codas (Li et al. 1986:5):

- m, -n, -ŋ,
- p, -t, -k,
- h, -ʔ,
- l, -lh

Beside the complex systems of finals, the initial systems of Austroasiatic languages are by no means simple. Except for Blang, Austroasiatic languages have voiced/voiceless contrast in their initial systems. The most extreme case is Wa, which has a four-way contrast of voiceless unaspirated/ voiceless aspirated/ voiced unaspirated/ voiced aspirated stops. A set of aspirated nasals and aspirated sonorants are also included in Wa's initial inventory, as opposed to their unaspirated counterparts:

| | | | |
|--------|------------------|-------|-----------------------------|
| pā | causative marker | phā | "half a box" |
| baŋ | "shed" | bhaŋ | "to open" |
| tā | "white" | thā | "to wait" |
| dā | "to bake" | dhā | "in advance" |
| kaŋ | "to forbidden" | khāŋ | "iron wok" |
| gaŋ | "shackles" | ghaŋ | "top" |
| tɕā | "cicada" | tɕhā | "to try" |
| dzā | "to shield" | dzhāt | "mat" |
| mā | "earth" | mhā | "mtepien" |
| nāŋ | "also" | nhāŋ | "to wear" |
| n-a | "mucus" | n,hāp | "trouble" |
| tɪʔ nā | "twenty" | n,hā | "male (animal)" |
| vaŋ | "to preserve" | v,hāŋ | "rare seed" |
| lā | "bamboo" | lhā | "late" |
| rā | "two" | rhā | "snow" |
| zā | exclamation word | zhā | "to give birth to (animal)" |

The complex initials (initial clusters) are very common in Austroasiatic languages. In Wa there are a Cl- series and a Cr- series (Zhou and Yan 1984:5):

| | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|
| pl | bl | kl | gl | pr | br | kr | gr |
| phl | bhl | khl | ghl | phr | bhr | khr | ghr |

In Blang, beside the Cl- series, there is an nC- series, including nasals plus aspirated consonants:

| | | | | | |
|-----|-----|-----|------|------|------|
| np | nt | nk | ntc | npl | nkl |
| nph | nth | nkh | ntch | nphl | nkhl |

The syllable structures of Austroasiatic languages, owing to their complex initials and finals, are more complex than the neighboring Kam-Tai languages. In Blang the maximum syllable is CCCVCT: for example, *nplakɪ* 'to exuviate'. In Wa the maximum syllable is CCVVVC: for example, *khrauh* 'birds) to sing'.

Affixation, including inflection, as a morphological process is widespread in the Austroasiatic languages. Therefore, these Austroasiatic languages have a larger number of affixes. For example, there are many prefixes in Wa (Zhou and Yan 1984:26):

| təu-: from verbs to nouns | | | |
|---------------------------|--------------|-------------|-------------|
| Root | Meaning | With prefix | Meaning |
| təau | "to appoint" | təau təau | "messenger" |
| lianj | "to herd" | təau lianj | "shepherd" |

kən-: changes of meanings with nouns

| Root | Meaning | With prefix | Meaning |
|------|----------|-------------|----------|
| pui | "person" | kən pui | "people" |
| ŋai | "eye" | kən ŋai | "pupil" |

kək-: changes of meanings with verbs:

| Root | Meaning | With prefix | Meaning |
|------|---------------|-------------|--------------------------|
| buan | "to overlook" | kək buan | "look into the distance" |
| taŋ | "to throw" | kək taŋ | "to throw far away" |

si-: changes of the meaning with roots:

| Example | Meaning | Example | Meaning |
|---------|--------------|---------|-----------|
| sɪ ʔaŋ | "bone" | sɪ mauʔ | "stone" |
| sɪ mah | "to quarrel" | sɪ gah | "to chat" |

Cu/Cu-: repetition.

| Root | Meaning | With prefix | Meaning |
|------|--------------|-------------|-------------------------|
| paik | "to scratch" | pu paik | "to scratch repeatedly" |
| dik | "to tread" | du dik | "to tread repeatedly" |

Inflection is also very productive, for instance, in Wa to express various morphological meanings (Zhou and Yan 1984:30):

Vowel alternation:

(1) Distinguishes dual from plural forms of nouns:

| Dual form | Meaning | Plural form | Meaning |
|-----------|----------------------|-------------|------------------|
| ʔaʔ | "we two (inclusive)" | ʔeʔ | "we (inclusive)" |
| pāʔ | "you two" | pēʔ | "you (pl.)" |
| keʔ | "they two" | kɪʔ | "they" |

(2) Distinguishes proximal from distal terms:

| Proximal form | Meaning | Distal form | Meaning |
|---------------|-------------|-------------|-------------|
| ʔin | "this" | ʔan | "that" |
| ʔin | "here" | ʔan | "there" |
| nin | "like this" | nān | "like that" |

Consonant alternation of voiceless/voiced:

(1) Changes classes of words:

| Verb | Meaning | Noun | Meaning |
|-----------|-------------|------------|----------------|
| pjh | "to sweep" | bilh | "broom" |
| top | "to cover" | dop | "cover" |
| Verb | Meaning | Classifier | Meaning |
| pin | "to seize" | bin | "a handful of" |
| tsieh | "to thread" | dzieh | "a bunch of" |
| Adjective | Meaning | Noun | Meaning |
| pit | "glutinous" | bit | "glue" |
| pu | "thick" | bu | "thickness" |

(2) From transitive to intransitive verbs:

| Transitive verb | Meaning | Intransitive verb | Meaning |
|-----------------|------------|-------------------|-------------|
| piak | "to break" | biak | "broken" |
| kah | "to untie" | gah | "scattered" |

Table 8.6 Examples of correspondence sets in Balu, Jing, Wa, and Khmer

| Gloss | Balu | Jing | Wa | Khmer |
|----------|---------|----------|--------|-------|
| father | pu:55 | bo:35 | ku:ing | a:poh |
| belly | pu:31 | bu:11 | vaik | pu:sh |
| hand | ti:55 | ta:35 | ta:i? | dai |
| to shave | ki:55 | ka:u:11 | khla:u | kao |
| to untie | ku:55 | ka:i:214 | ka:h | qoh |
| fish | qo:55 | ka:35 | ka:? | trei |
| big | thau:31 | to:33 | ti:ng | thom |
| to cut | te:u:31 | ka:35 | ki:p | kat |
| you | mi:33 | ma:i:22 | ma:i? | mat |
| hat | ma:u:33 | mu:214 | mhok | mu:k |
| this | ni:55 | na:22 | ni:h | nih |
| year | nam:13 | nam:33 | nu:m | fnam |
| to lick | li:m:31 | liem:35 | let | lat |
| bird | san:53 | tsim:33 | sim | tfap |

Affixation and inflection also play important roles in De'ang and Blang grammar, although in Jing affixation is still active without much inflection.

The syntactical features of Austrasiatic languages are similar to those of Kam-Tai languages, and the typological features of Austrasiatic languages can be summarized as follows:

- Analytical.
- Monosyllabic. Many are toneless. The maximum syllable is CCCVVCT for tonal languages, or CCVVVC for toneless languages.

- Affixation and inflection are widely used as major morphological devices.
- The constituent orders are: Subject + Verb + Object, Head + Modifiers.

In 1980s some Chinese scholars found that Wa, De'ang, and other Austrasiatic languages in China are similar to Dai in some aspects and doubted whether they should be classified as Kam-Tai languages (Wang and Chen 1982; Lai 1986:2). From the correspondences with the basic vocabulary in Khmer language, we can say with confidence that Wa, Balu, Mang, and Jing should be classified as Austrasiatic languages (Yan and Zhou 1995:36–41). See Table 8.6.

8.4 AUSTRONESIAN LANGUAGES

Austronesian languages in China are mainly spoken in Taiwan. Taiwan Austronesian languages are still typical agglutinating languages. For more details, see chapter 9 in this volume.

Although Austronesian is quite different from Kam-Tai typologically, there are some corresponding sets in the basic vocabulary between the Austronesian and Kam-Tai. More and more correspondent sets have been discovered recently. See Table 8.7 for examples (from Chen and Wang 2009).

Furthermore, the more basic these words are, the more correspondences there are between the two groups. Consequently, the hypothesis that the Austric family includes Kam-Tai and Austronesian appears quite reasonable.

In addition, the typological differences between Austronesian and Kam-Tai result mainly from contact with the Chinese. Huihui, an Austronesian language spoken outside Taiwan, can give us a model of the contact. Hainan Muslims speak a language

Table 8.7 Examples of correspondence sets between Kam-Tai and Austronesian languages

| Lexical items | Dai | Proto-Tai | Indonesian | Indonesian root |
|---------------|-------|------------|------------|-----------------|
| moon | lan6 | *ʔol/rwen1 | bulan | -lan |
| black | lam6 | *ʔdl/sem1 | hitam | -tam |
| bite; gnaw | kat7 | *kat7 | gigit | -git |
| cat | kin6 | *kin1 | makan | -kan |
| l | kaue6 | *ku:1 | aku | -ku |
| tongue | lin4 | *lin4 | lidah | li- |
| come; arrive | ma2 | *ma2 | mari | ma- |
| bird | lok8 | *n1/rok8 | manuk | -nuk |
| fish | pa6 | *pa:1 | patin | pa- |
| understand | hu4 | *ru4 | tahu | -hu |
| eye | ta6 | *tra:1 | mata | -ta |
| die | ta:i6 | *tra:i1 | mati | -ti |
| seed | fan2 | *van2 | bibit | bi- |

Table 8.8 Examples of tonal correspondence between Huihui and the surrounding Chinese dialects

| Tonal categories | Yacheng Junhua | Danzhou Dialect | Huihui | Examples |
|------------------|----------------|-----------------|--------|-------------------------------------|
| Yinping | 33 | 33 | 33 | kha:i33 "to open" kia:33 "home" |
| Yangping | 21 | 31 | 11 | na:n11 "south" zin11 "man" |
| Shangsheng | 11 | 53 | 11 | pha:n11 "opposite" zin11 "eye" |
| Qusheng | 55 | 55 | 33 | ta:u33 "to arrive" ti:33 "earth" |
| Rusheng | 214 | 55 | 24 | si:t24 "to lose" zit "sun" |

called Huihui, which differs from the neighboring Chinese and Kam-Tai languages. In comparing its basic vocabulary with that of Rhade, a language of the Cham branch of Austronesian languages, we found that Huihui is an Austronesian language.

However, Huihui is typologically similar to Chinese or Kam-Tai instead of Austronesian languages in Taiwan. Its most obvious feature is its tonal system. Huihui has seven tones (five tonal categories after generalization) that correspond to the tones of the surrounding Chinese dialects (see Table 8.8; from Zheng 1997:30).

Although there are internal factors for the tonogenesis of Huihui, the loss of consonantal endings, which is the result of contact with Chinese dialects (Zheng 1997:39), plays an important role in Huihui's tonal development.

Another feature that distinguishes Huihui from Taiwan's Austronesian languages is that it is not an agglutinating language. Huihui has only three widely used prefixes (Zheng 1997:65):

?ai1- appears before animal names and kinship terms:

| Root | With prefix | Meaning |
|-------|-------------|---------|
| ?ba11 | ?ai1?ba11 | uncle |
| sau33 | ?ai1sau33 | dog |

huu1- precedes animal or plant names, or body parts:

| Root | With prefix | Meaning |
|-------------|-----------------|----------|
| tin33?tuk24 | huu1tin33?tuk24 | owl |
| tsion33 | huu1tsion33 | eggplant |
| khain1 | huu1khain1 | tooth |

na11-, a prefix indicating loveliness, appears before nouns:

| Root | With prefix | Meaning |
|-------------------|-------------|----------------|
| ki24 "stool" | na11ki24 | small stool |
| li33 "ring" | na11li33 | finger ring |
| tsun11 "wine cup" | na11tsun11 | dimple |
| pio24 "squirrel" | na11pio24 | small squirrel |

FURTHER READING

- For details about each individual Austric language, see Li (1940, 1956, 1957), Xing (1989), Li and Zhou (1999), Iwasaki (2005), and Diller et al. (2008).
 For more evidences about the historical change of Kam-Tai languages, see Li (1977) and Chen (2012).
 For more discussion on the historical position of Kam-Tai languages, see Ma and Luo (1962), Yan (1979), Xing (1949, 1962, 1993, 1999), and Zeng (2004).

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CHAPTER 9

THE AUSTRONESIAN LANGUAGES OF TAIWAN

PAUL JEN - KUEI LI

9.1 INTRODUCTION

The Austronesian language family, which has a predominantly insular distribution, covers about two-thirds of the globe: Taiwan to the north, New Zealand to the south, Madagascar to the west, and Easter Island to the east. In addition to Formosan languages, Austronesian languages are commonly divided into western Austronesian and eastern Austronesian (= Oceanic); the maps will appear on a companion website www.oup.com/us/ohcl. The western Austronesian languages are spoken in the Philippines, Borneo, Malaysia, the western parts of Indonesia (= the Greater Sundas), and Madagascar. The Oceanic languages are spoken in three main geographical areas: Melanesia to the south, Micronesia to the north, and Polynesia to the east (see Figure 9.1). The total population of the family is estimated at about 400 million, the largest being in Indonesia (253 million), followed by the Philippines (100 million), Malaysia (30 million), and Malagasy (23 million; 2014, <http://countrymeters.info/en/>), while the Austronesian population in Taiwan is only half a million, about 1/800th of the total population. The number of Austronesian languages has been reported as 1,200 (Grimes et al. 2005), of which only twenty- some are found in Taiwan. The Austronesian languages of Taiwan are generally known as "Formosan languages." No Austronesian language is spoken in mainland China, though one, designated as Huihui (回辉) on Hainan Island, is believed to be a Chamric language of Austronesian.

The Formosan languages that are still spoken today include the following: Atayal, Seediq, Saisiyat, Thao, Bunun, Tsou, Kanakanavu, Saaroa, Rukai, Paitan, Puyuma, Amis, and Kavalan. Most of the languages formerly spoken in the western plains are now extinct, including Basay, Kulon, Taokas, Babuza, Papora, Hoanya, Pazih, and Siraya (see Figure 9.2). Most of them ceased to be actively spoken nearly 200 years ago. We lost the last competent speaker of Basay in early 1937 and that of Pazih in October 2010. We

are left with scanty language data for most of these extinct languages. There are some Dutch missionary documents for Siraya and Favorlang (dialect of Babuza) in mid-17th century and Japanese field notes for Basay vocabulary and texts in 1937. In other words, only three plain languages (Siraya, Favorlang, and Basay) have a fair amount of written documents for grammatical analyses.

9.2 THE IMPORTANT POSITION OF FORMOSAN LANGUAGES

Despite the small number of Austronesian languages in Taiwan, they are the most valuable for two features: (a) they are the most diverse, and (b) they are the most archaic in the entire Austronesian language family. The great diversity of Formosan languages indicates that the Formosan peoples must have settled on the island in a great time depth. Taiwan is thus conceivably one of the oldest settlements, most likely the Austronesian homeland and center of Austronesian dispersal (Blust 1985; see Figure 9.3). In the early 1930s, it was shown by the Japanese linguist Naoyoshi Ogawa (1930a, 1930b, 1935) that Formosan languages retain many archaic features, such as the retentions of *S and *q, the distinctions between *t and *C, *n and *N, in the now generally accepted Proto-Austronesian (PAN) phonological systems. In other words, the PAN consonants have undergone the following sound changes in all Austronesian languages outside Taiwan, known as "Malayo-Polynesian": *S > h or is lost, *q > ? or is lost, *t and *C have merged as t, and *n and *N have merged as n. Dyen's (1965) reconstructions of some new PAN phenomena are based on Formosan evidence provided by Ogawa originally. As an illustration of the archaism of Formosan languages, the sound change s > h is commonly found in languages, whereas the reverse has not been attested in any language of the world. Consequently, Formosan languages are indispensable for reconstructing PAN and the early history of Austronesian dispersal and settlements.

Leading Austronesian scholars, such as Dahl (1973, 1981), Dyen (1971), Blust (1985, 1999), Ross (1995, 2009), and Starosta (1995), generally agree with these two salient features of Formosan languages, although Dyen (1971) has reservations about Taiwan as the Austronesian homeland.

Formosan languages are the most diverse not only diachronically but also synchronically at all levels of their linguistic structures, including the following: (a) "Focus systems," in which a set of verbal affixes permit a range of arguments to serve as the most prominent noun phrase of the clause, are found in all Formosan languages and western Austronesian languages except Rukai. Most divergent types of focus systems are attested in Formosan languages. (b) While Tsou requires an auxiliary verb in each clause, there is no auxiliary verb at all in a few other Formosan languages, such as Pazih, Kavalan, and Paiwan. Moreover, the auxiliary and main verb of each clause must agree in focus in Tsou, whereas there is no such requirement in the other Formosan languages. (c) Most

Formosan languages distinguish between human and nonhuman features in their numeral systems, whereas a few (Saisiyat, Pazih, and Favorlang) do not. Many of them mark [+human] by *Ca-* reduplication, while the others indicate the distinction by a prefix or by alternation of vowels and/or consonants. (d) A language may have morphologically only free personal pronouns, as in Saisiyat; mostly free, as in Thao, which has only a few bound pronominal forms in addition to three sets of free forms; or mostly bound, as in the Mantauran dialect of Rukai, in which other than a small set of free forms in the topic position, there is a much larger set of pronominal bound morphemes. There is no bound nominative third-person pronoun in any Formosan language except Tsou. (See Li 2008 for further information.)

9.3 AUSTRONESIAN RECONSTRUCTIONS AND SUBGROUPING

Haudricourt (1965) proposes three major subgroups: Northern (= Formosan), Western, and Eastern (= Oceanic) for the Austronesian language family. It is first stated in Dahl (1973:125), "The phonemic/phonetic situation of the Formosan subgroup thus gives a very archaic impression. The grammatical examination of the scant information available has shown old features. . . I consider the Formosan subgroup to represent the first offshoot from the main AN [Austronesian] family." Later on, Dahl (1981:15) claims again that "Formosan languages are so archaic both in phoneme inventory and grammatical forms that they to a certain degree constitute a 'museum' preserving old Austronesian material." Different subgrouping hypotheses have been advanced in the past two decades. Based on grammatical evidence, Starosta (1995) believes that Rukai is the first offshoot of PAN, Tsou the second, and so on. Based on phonological innovations, Blust (1999) divides all Formosan languages into nine subgroups, treats all Austronesian languages outside Taiwan as the tenth subgroup, and considers all these ten as the primary subgroups of PAN. This subgrouping hypothesis is the most well known and more generally accepted. Later, Ross (2009), based on phonological and morphosyntactic evidence, states that Rukai, Tsou, Puyuma, and Nuclear (all the other Austronesian languages) are the four major subgroups of PAN. It is clear that all these leading Austronesian scholars treat Formosan languages as one or more primary subgroups of PAN.

Blust's classification of the Formosan languages based on shared phonological innovations is: (1) Atayalic, including Atayal and Seediq; (2) East Formosan, including Basay, Kavalan, Amis, and Siraya; (3) Puyuma; (4) Paiwan; (5) Rukai; (6) Tsouic, including Tsou, Kanakanavu and Saaroa; (7) Bunun; (8) Western Plains, including Thao, Taokas, Babuza, Papor, and Hoanya; and (9) Northwest Formosan, including Saisiyat, Kulon, and Pazih. There are some problems in his classification. For one thing, there are too many primary subgroups of PAN. For another, he does not provide any evidence for some of the subgroups. For instance, he regards the Atayalic subgroup as "self-evident,"

without providing any evidence. In fact, there is little phonological evidence for this subgroup. However, an important piece of morphological evidence is that there are male and female forms in all Atayal and Seediq dialects. There is also little phonological evidence for the so-called Tsouic subgroup. Kanakanavu and Saara may belong to a separate subgroup (Chang 2006; Ross 2009), although it is not clear to which other Formosan language(s) they are most closely related.

9.4 THE EXTERNAL RELATIONSHIPS OF AUSTRONESIAN LANGUAGES

If Taiwan was the center of dispersal of the Austronesian language speakers, where did they come from? An answer to the question has to do with this problem: To which other language family is the Austronesian language family most closely related? Several hypotheses have been proposed, including (a) Austro-Tai (Austronesian related to Tai: Benedict 1942, 1975); (b) Japanese and Austronesian (Kawamoto 1977; Benedict 1990); (c) Sino-Austronesian (Sagart 1993, 1994); and (d) Austric (Austronesian related to Austroasiatic: Hayes 1992; Diffloth 1994; Reid 1994, 1999). Austronesian and the other four language families (Tai, Japanese, Chinese, and Austroasiatic) mentioned previously are all found in East Asia. If Austronesian is related to any one of the four, then it must have originated in East Asia. A few other languages or language families, such as Indo-European and Latin American Indian, have also been suggested, but few scholars have taken them seriously (Blust 2009:689–709). Among all these, perhaps the most promising is the Austric hypothesis, namely that Austronesian and Austroasiatic are most closely related.

An important piece of evidence for the Austric hypothesis is that the two infixes *<im>* and *<in>* commonly found in Austronesian languages are also found in Nicobarese, an Austroasiatic language spoken in an isolated island in the Indian Ocean (Reid 1994, 1999). The Austric hypothesis is thus accepted by leading Austronesian scholars, such as Robert Blust (1996). Austrasiatic languages are spoken in the continental Southeast Asia. If Austronesian is related to it, then it must have originated from that area (see Figure 9.4). Archaeological evidence also points to the southeastern coastal areas of Asia for pre-Austronesian.

9.5 MALE AND FEMALE FORMS OF SPEECH IN MAYRINAX ATAYAL

An interesting and peculiar feature of Mayrinax, an Atayal dialect, is that it retains male and female forms of speech, whereas such a distinction is lost in all other Atayalic dialects and is not found in any other Formosan language. It is not reported in any of the

Table 9.1 Male and female forms of speech in Mayrinax

| (1) | Glosses | Female | Male | Proto forms |
|-----|----------------|----------|-----------|---------------|
| | 'fire' | hapuy | hapu-niq | < PAN *Sapuy |
| | 'road' | raan | ran-iq | < PAN *Zalan |
| | 'ratio, write' | matas | mat-iq | < PAN *matas |
| | 'front yard' | lata | lata-nux | < PAN *NataD |
| | 'raw' | matatq | mat<ll>uq | < PAN *matatq |
| | 'drunk' | ma-busuk | bus<in>uk | < PAN *busuk |
| | 'needle' | ragum | raum | < PAN *ZaRum |
| | 'hunt' | qalup | qalu<a>p | < PAN *qalup |
| | 'mortal' | luhning | luh<i>ung | < PAN *Nesung |
| | 'sprout, baby' | hubq | lubq | < PAN *kuCu |
| | 'head louse' | kucu | kuhing | < PAN *kuCu |
| | 'pig' | 'tubuh | baauk | < PAN *beRek |
| | 'woman' | kanawnu' | kanayril | |

Note: PAN = Proto-Austronesian.

minority languages in China either. Mayrinax is the only known Atayal dialect that shows certain well-defined differences between the male and female forms of speech, with 107 items (roots) having been recorded, or about 10% of its total vocabulary (Li 1982). The female forms usually preserve the archaic features and are the original forms representing PAN reflexes, whereas the corresponding male forms are innovative and not easy to identify as cognates. The female forms generally preserve CVCVC, a typical Austronesian word structure, whereas the male forms may have some type of suffix added or infix inserted, an intervocalic consonant deleted, the word-initial consonant or final syllable replaced, and a few items involve suppletive forms (Table 9.1).

Only a male or female form is kept in each Atayal dialect, for example, *m-busuk* in Squliq and Bala, *m-s<in>uk* in Skikun and Mawyan, *ma-bus<in>uk* in Mabatuan and Matabalay, *ma-ba-s<in>uk* in Maspazi and Sakuxan, *ma-s<in>uk* in Bay'anux, *ma-s<n>uk-an* in Pilingawan, and *busk-an* 'drunk' in all Seediq dialects. See Li (1982) for further information and more detailed discussion.

9.6 BUNNUN

Due to limited space, I describe Isubkun, a dialect of Bunnun spoken in Nantou in some detail as an illustration of the structure of a Formosan language. Bunnun is not very well studied. Previous work on Bunnun includes Ogawa and Asai (1935), Jeng (1977), Li (1988, 1997), Lin (1996), Nojima (1996), and Zeitoun (2000). Bunnun is spoken mostly in the mountainous areas from central to southern Taiwan and also in the east coastal areas of Taiwan, with a population of 55,784. There are five major dialects of Bunnun: Taktituduh,

Takbakhá, Takbanuaz, Takivatan, and Isbukun. Ogawa and Asai (1935:585) refer to the first two as the northern dialects, the third and fourth as the central dialects, and the last as the southern dialect. The northern dialects keep the distinction between dental affricate /c/ and fricative /s/, while the other dialects have merged them as /s/. In contrast to the other four dialects, the southern dialect, Isbukun, has undergone the following phonological innovations: (a) $q > h$, (b) $h > ?$ or lost, (c) loss of ? intervocally, (d) palatalization of t before i , and (e) the tendency of devoicing syllable-final v and z , especially toward the south. Isbukun is the most divergent dialect of Bunun in its phonology, lexicon, and morphosyntax (Li 1988, 1997).

9.6.1 Phonology

Isbukun has the following fourteen consonants /p, t, k, ? (?), b, d, v, ʔ (z), s, h, m, n, ŋ (ng), l/ and three vowels /i, u, a/ but no semivowels. Of these, the voiceless stops are unaspirated, /b/ and /d/ are preglottalized voiced stops, /s/ is an alveolar or alveopalatal, and /h/ a voiceless pharyngeal fricative. The glottal stop is phonemically significant, for example, *mas'an* 'ten', *su uan* '2SG.LOC'. The high vowels /i/ and /u/ have their phonetic variants [e] and [o] respectively when adjacent to /h/, for example, /huspi/ [hospil] 'hair'. Stress falls on the final syllable, but it may fall on the penult, depending on the geographical area. Vowel length is phonemic, for example, *mai-sidi* 'mutton' versus *maisi-dii* 'from there'.

All consonants occur word-initially, medially and finally. Consonant clustering may occur only in the word-medial position, for example, *bivah* 'thunder', *vahlas* 'river', *bin-tuhan* 'star', *masubnuh* 'angry'.

Morphophonemic alternations in Isbukun include (a) $b \sim p$, (b) deletion of a consonant before another consonant in the initial position, (c) $n \sim ng$, and (d) metathesis of the diphthongs *ua* and *ia*, as illustrated in the following (cf. also Lin 1996).

- (2) $b > p / _ \#$ (e.g., *minsunab-in*, *minsunap* 'burn')

This devoicing rule applies only to the labial stop in the word-final position but not to the dental stop for some older speakers. However, it may apply not only to the dental stop d but also to the fricatives, v and z , especially in the speech of younger speakers.

- (3) $C > \emptyset / _ \#$ (e.g., *sa-spat* 'four people', *paat* 'four'; *a-abnum* 'six people', *num* 'six')

Consonant clustering never occurs in the word-initial position. The first consonant is deleted when a consonant cluster occurs in such a phonetic environment.

- (4) $n > ng / _ k, h$ (e.g., *min-bawa* 'swell'; *tin-tunglaz* 'fall down', *ting-kalili* 'drift'; *min-tanam* 'taste', *ming-kalias* 'wake up'; *mun-tunuh* 'collapse', *mung-huma* 'weed'; *tun-daza* 'hide', *tung-habin* 'hide oneself')

As manifested in these examples, the neutral forms of the verbal prefixes end with n when preceding a verb stem that begins with a labial or dental consonant, while their variant forms end with ng - when preceding a verb stem beginning with a back consonant k or h . In these cases, n can be treated as the base and ng as derived.

- (5) Metathesis of *ua > au*, *ia > ai* / +Suffix, for example, *ma-tua*, *tau-un* 'open'; *ma-suaz*, *suaz-an* 'plant'; *buan* 'moon', *baun-an* 'the moon rises'; *ku-zaku-an*, *ku-zakam-a* 'Come to my place!'; *vilan* 'personal name', *vilan-an* 'subclan name'; *dahvi-an* 'far', *pun-dahvain-un* 'move far'

As illustrated here, there is metathesis of *ua* to *au* and *ia* to *ai* when followed by a suffix.

9.6.2 Morphology

As in the other Formosan languages, affixation and reduplication are two very common morphological processes in Isbukun.

9.6.2.1 Affixation

There are numerous prefixes, only one infix (<*i*(*n*)>) 'perfective', and sixteen suffixes in Isbukun. The following is a small sample of its prefixes:

- ka-* + V 'do, make', e.g., *ka-'atal* 'build a bridge' < 'atal 'bridge', *ka-huma* 'cultivate a field' < *huma* 'field', *ka-lumah* 'build a house' < *lumah* 'house'
ma- + N 'verbalizer', e.g., *ma-'asik* 'sweep' < 'asik 'broom', *ma-'iv'iv* 'have a breeze' < 'iv'iv 'breeze'
masu- + N/V 'flourish', e.g., *masu-lukis* 'flourish with trees' < *lukis* 'tree', *masu-ismut* 'prairie' < *ismut* 'grass'
m-u- + N 'go', e.g., *m-u-daan* 'leave' < *daan* 'road', *m-u-huma* 'go to a field' < *huma* 'field'
si- + N 'verbalizer', e.g., *si-binsah* 'pick seeds' < *binsah* 'seeds'

Unlike many other Formosan languages, in which there are two productive infixes, <*um*> 'Actor-focus' and <*in*> 'perfective', there is only one productive infix, <*in*> or <*i*> 'perfective' in Bunun (e.g., *h<in>uud* 'have drunk', *m<in>aun* 'have eaten', *sa<i>du-in* 'have seen', *ta<i>l-bungu* 'have washed one's head'). Notice that while <*in*> is inserted after the initial consonant of a verb stem, <*i*> is inserted after the initial consonant and the first vowel of a verb stem or prefix.

The following are some examples of suffixes:

- a* + V 'AF:IMP', e.g., *sadu-a-zaku!* 'Look at me!'
-av + V 'NAF:IMP', e.g., *sadu-av-saikin!* 'Look at me!'

-an + N 'verbalizer', e.g. *vahi-an* 'the sun rises' < *vahi* 'sun', *damuh-an* 'have dew' < *damuh* 'dew'
 -an + V 'nominalizer; location', e.g. *hanup-an* 'hunting area' < *hanup* 'hunt'

9.6.2.2 Reduplication

As in most other Formosan languages, there are full reduplication and partial reduplication in Isbukun. The latter includes CV- reduplication, Ca- reduplication, and CVC-reduplication. CV- reduplication is the most productive in Bunun (Lee 2007:162).

CV- reduplication of an active verb indicates a progressive or repetitive action, for example, *si-su-suab* 'keep yawning', *tangis* 'cry' > *ta-tangis* 'keep crying' and that of a noun indicates plurality, for example, 'uvaaz 'child' > *u-va-vaaz* 'children'.

Ca- reduplication of a numeral indicates [+human], for example, *dusa* 'two' > *da-dusa* 'two people', *pia* 'how many' > *pa-pia* 'how many people'.

CVC-reduplication is attested only in *biz-bizak* 'move, vt' (cf. *bizak-bizak* 'move, vi'). Full reduplication is rather rare in Bunun. Full reduplication of a stative verb indicates intensity, for example, *mus-u-mus'ung* 'very untidy (dressing)', *vasvas* 'scattered' > *vasvas-vasvas* 'very messy', *bazang-bazang* 'behave improperly'. Notice that the reduplicant may leave out the coda.

9.6.3 Syntax

There are two main syntactic categories, nouns and verbs, plus function words, which show the grammatical relations in each sentence. The root of a noun or verb is mostly disyllabic, while a derived form by affixation is polysyllabic. Function words are mostly monosyllabic. Function words include case markers, topic markers, and ligature.

9.6.3.1 Word Order

Like most other Formosan languages, Isbukun is predicate-initial. That is to say, the main verb or predicate appears in the sentence-initial position and all the other arguments follow it. For example,

- (6) m-aduu saikin 'alang.
 AF-like 1SG.NOM name
 'I like 'alang.'
 (7) m-ama' tina='a' mas 'uvaaz.
 AF-carry mother=that.NOM OBL child
 'That mother is carrying a child (on her back).'

9.6.3.2 Case Marking and Personal Pronouns

A noun, including common nouns, personal names, personal pronouns, and demonstrative pronouns, is case-marked. The nominative marker is *a* while an oblique marker is (*ma*)s for a common noun, and they are optional, as in:

- (8) panah-av (a) 'aval='a'
 NAF:shoot-IMP NOM flying.squirrel=that.NOM
 'Shoot that flying squirrel!'
 (9) m-amah tama='an (mas) 'aval.
 AF-shoot Dad=this.NOM OBL flying.squirrel
 'Father shot a flying squirrel!'

In addition, there is a locative marker *sia*, as in:

- (10) ma-da-damu-s bunun tu kuhtiz sia hutun.
 AF-RED-catch-OBL people COMP crack LOC wall
 '(She) kept catching people (hiding) in the cracks of the wall.'

Personal pronouns are inflected for case. There are four main sets of personal pronouns: nominative, oblique, possessive, and locative. There are both long (free) and short (bound) forms in each set except the locative.

Like the other Austronesian languages, there is a distinction between inclusive and exclusive for the first-person plural pronouns. The third-person pronouns are derived from the demonstrative pronouns (e.g. *sai'a* '3SG.NOM', *nai'a* '3PL.NOM'). They are not listed in Table 9.2. For example,

- (11) ma-ludah kasu' zaku'.
 AF-hit 2SG.NOM 1SG.OBL
 'You hit me.'

Table 9.2 Personal pronouns in Isbukun

| | Nominative | | Oblique | | Possessive | | Locative | |
|-------|------------|-------|---------|-------|------------|--------|----------|----------|
| 1sg | Free | Bound | Free | Bound | Free | Bound | Free | Bound |
| 2sg | saikin | -ik | zaku' | -ku' | 'inaak | -nak | zakuan | -zakuan |
| 1incl | kasu' | -as | suu' | -su' | 'isuu' | -su' | su'uan | -su'uan |
| 1excl | kata' | -ta' | 'ta' | -ta' | 'mita' | -mita' | mitaan | -mitaan |
| 2pl | kaimin | -im | zami' | -mu' | 'inam | -nam | zaminan | -zaminan |
| | kamu' | -am | muu' | -mu' | 'inuu' | -mu' | mu'uan | -mu'uan |

- (12) m-aduu-'ik suu'.
 AF-like-1SG.NOM 2SG.OBL
 'I like you.'

9.6.3.3 Focus System

Like most other Formosan languages and western Austronesian languages, there is a focus system in Isbukun: (a) actor-focus, indicated by *m*-, *ma*-, \emptyset ; (b) patient-focus, indicated by *-in*, \emptyset , occasionally by *-an*; (c) locative-focus, indicated by *-an*; and (d) referential-focus, either instrumental focus or beneficiary-focus, indicated by *is*-. The morphological marking indicates the thematic role of the most prominent noun phrase of the clause, be it (1) the actor, (2) the patient, (3) the location, (4) the instrument or beneficiary, as the definite subject of the sentence. The above affixes are all realis markers. For example,

- (13) a. m-aun 'uvaaz='a' mas tai'.
 AF-eat child=that.NOM OBL taro
 'That child ate taro.'
 b. kaun-un mas 'uvaaz=ta' tai'.
 eat-PR OBL child=that.OBL taro
 'The taro was eaten by that child.'
- (14) kazkaz-un tama' dalah.
 dig-PR Dad soil
 'The soil was dug up by Father'
- (15) kazkaz-an saian dalah=tan.
 dig-LF this soil=this.OBL
 'This is the place to dig this soil.'

When there is a contrast between *-in* and *-an*, the event in the former is complete or intense, while that in the latter it is partial or less intense, as in:

- (16) a. halhal-un-ku' a batu='a'
 drop-PR-1SG.NOM NOM stone=that.NOM
 'I dropped the stone.'
 b. halhal-an-ku' a tummaz='a' mas batu.
 drop-LF-1SG.NOM NOM bear=that.NOM OBL stone
 'I dropped a stone on the bear.'

In (16a) above, the patient 'the stone' is totally affected, while in (16b) the locative 'the bear' is partially affected only on the surface (Nojima, p.c.).

A few verbs take the suffix *-in* but not *-an*, for example, *pasnud-in* 'to swallow' but not **pasnud-an*, and vice versa with a few other verbs, for example, *sukud-an* 'to close' but not **sukud-in*.

- (17) 'is-tuktuk-ku' halil' lukis.
 IR-chop-1SG.NOM knife tree
 'I chopped trees with the knife.'
- (18) 'is-pataz tama' 'uvaaz='a' mas tulkuk.
 BF-kill Dad child-that.NOM OBL chicken
 'Father killed a chicken for the child.'

The most prominent noun phrase in (17) is *halil'* 'the knife', while that in (18) is *'uvaaz-'a* 'the child'. The former is an instrument (inanimate) while the latter is a beneficiary (animate).

The irrealis marker is *na*= before the main verb, which indicates an event that may take place in the future (Zeitoun 2000:80–81). For example,

- (19) na=pali'uni saikin mas ning'av habas.
 IRR=talk 1SG.NOM OBL sea ancient
 'I shall talk about an ancient sea.'

9.6.3.4 Aspect

There is an aspect system but no real tense system in the language. The perfective aspect is indicated by the infix <*i(n)*>, as in:

- (20) h<in>uud 'aupa' kasu' davus?
 drink<PRV> ever 2SG.NOM wine
 'Have you ever drunk wine?'
- (21) ma-i-ludah=in kasu' zaku'.
 AF-PRV-hit=ICP 2SG.NOM 1SG.OBL
 'You have hit me.'

The incipient marker =*in* is unique to Bunun, as in (21) and (22).

- (22) huud=in saikin davus.
 drink=ICP 1SG.NOM wine
 'I've started to drink wine, and I'm still drinking.'

9.6.3.5 *Lexical Prefixes*

An interesting feature of Bunun is the recurrence of lexical prefixes, in which the same lexical prefix with the same semantic content may recur with more than one verb in the same sentence, as first observed by Nojima (1996):

(23) *taus-* 'uvaaz a maluspingaz='a *taus-*dusa. (Nojima 1996:10)
give.birth-child NOM woman=that.NOM give.birth-two

'The woman gave birth to twins.'

(24) *mis-*pataz *mis-*busuk. (Nojima 1996:12)
burn-kill burn-drunk
'He is dead drunk.'

A similar pattern is found in a few other Formosan languages, such as Siraya (Tsuchida 2000), Tsou (Chang 2009), and Saaroa (Li 2009).

9.7 CONCLUSION

This chapter has given a very general survey of the Formosan languages in the Austronesian language family and described the Isbukun dialect of Bunun in some detail, including its phonology, morphology, and syntax, as an illustration of the structure of a Formosan language. Nevertheless, hopefully it has demonstrated how interesting and valuable such a language is. For further information, readers are referred to the references.

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CHAPTER 10

TIBETO-BURMAN

GEORGE VAN DRIEM

10.1 FROM TIBETO-BURMAN
TO TRANS-HIMALAYAN

Johrus von Klaproth was the first scholar to assign Chinese correctly to its proper language family. In 1823, he identified the Tibeto-Burman phylum in Paris in his polyphyletic view of Asian linguistic stocks. Klaproth's model of many distinct Asian linguistic phyla was initially controversial because many scholars in the West at the time entertained an undifferentiated view of Asian languages as all belonging to some nebulous all-encompassing language family.

His Tibeto-Burman comprised Burmese, Tibetan, Chinese and all of the languages that could be demonstrated to be related to these three. He explicitly excluded languages today known to be Kra-dai or Daic (e.g., Thai, Lao, Shan), Austroasiatic (e.g., Mon, Vietnamese, Nicobarese, Khmer) and Altaic (e.g., Japanese, Korean, Mongolic, Turkic). The name Tibeto-Burman gained currency in English for the language family recognized by Klaproth and was widely used by scholars in the British Isles (e.g., Hodgson 1857; Cust 1878; Forbes 1878; Houghton 1896).

Some other scholars of the day followed the Indo-Chinese theory proposed by the Scots amateur John Casper Leyden, who died at the age of thirty-five after experiencing a short but dazzling career in the British colonial administration in Asia during the Napoleonic wars. In 1807, Leyden proposed his exuberant but poorly informed Indo-Chinese theory to George Barlow, Governor-General of India at Fort William, in which he claimed that all the languages in Asia and Oceania shared some "common mixed origin" (Leyden 1808).

This murky view held appeal to adherents of Biblical mythology who had been inclined to lump Chinese together with numerous other Asian languages into a grand Japhetic family, on the assumption that Chinese was one of the languages spoken by the descendants of Noah's son Japhet, while some alternatively attempted to explain

Chinese as an antediluvian language or as one of the “confounded” forms of speech with which Yahweh had afflicted mankind after the fall of the Tower of Babel.

The Biblically inspired Japhetic was not the only pan-Asian catch-all. Wilhelm Schott wrote personally to the famous scholar of Himalayan languages Brian Houghton Hodgson to warn him against the “Turanian” theory then being propagated from Oxford.¹ In 1856, Schott likewise published an essay warning against “Indo-Chinese.” Schott foresaw that scholars who used the label would continue to think in terms of the mistaken phylogenetic model that the label designated. Yet the Indo-Chinese model became the favourite of racist language typologists who believed that Asian languages were generally more rudimentary and that Asian peoples were more primitive than their Western counterparts.

Grammatical typology inspired language typologists such as Heymann Steinthal (1850, 1860), Ernest Renan (1858), Arthur de Gobineau (1854–1855), and John Beames (1868) to rank Chinese and Thai together on the lowest rung of the evolutionary ladder of language development based on their “monosyllabicity” and lack of inflection. These scholars argued that Chinese and Thai must be closely related and that neither was part of Tibeto-Burman. James Byrne (1885) argued that “the causes which have determined the structure of language” lay in the varying “degrees of quickness of mental excitability possessed by different races of men.” Chinese and Siamese ostensibly mediated a rudimentary, less evolved way of thinking and so were assigned to the lowest rungs of Steinthal’s ladder of language evolution. The following quote typifies this once widespread genre of scholarly discourse.

la langue chinoise, avec sa structure inorganique et incomplète, n'est-elle pas l'image de la sécheresse d'esprit et de cœur qui caractérise la race chinoise?... Suffisante pour les besoins de la vie, pour la technique des arts manuels, pour une littérature légère de petit aloi, pour une philosophie qui n'est que l'expression souvent fine, mais jamais élevée, du bon sens pratique, la langue chinoise excluait toute philosophie, toute science, toute religion, dans le sens où nous entendons ces mots. (Renan 1858:195–196)

Such reasoning was vehemently opposed by scholars following the tradition of Wilhelm von Humboldt (1822, 1825, 1836), such as August Friedrich Pott (1856) and Friedrich Max Müller (1871, 1881), who argued that the relationship between language structure and thought was not so simplistic and who stressed that biological ancestry was independent of language.

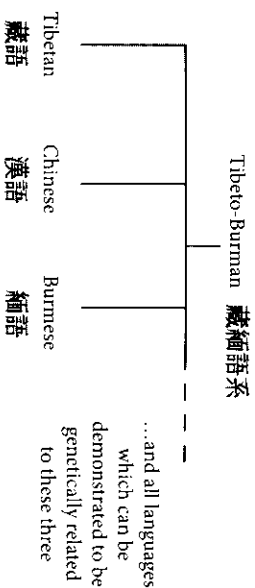


FIGURE 10.1 Julius von Klaproth’s Tibeto-Burman family.

At first, Indo-Chinese encompassed Asian languages from the Caspian Sea to Polynesia. This untenable construct embodied numerous misguided phylogenetic conjectures and so came to be whittled down in successive stages. After Philipp von Siebold (1832) and Anton Boller (1857) presented their case for a distinct Altaic phylum, Ernst Kuhn (1883, 1889) began to fix what was still wrong with the Indo-Chinese model by correcting the erroneous inclusion of Austroasiatic, but the resulting model still represented a false family tree. Yet some scholars and several notable sinologists adopted the Indo-Chinese name and the false Indo-Chinese phylogeny (e.g., von der Gabelentz 1881; Forchhammer 1882; Conrady 1896; Laufer 1916; Wulf 1934).

In 1924, the French orientalist Jean Przyluski coined *sino-tibétain* as the French term for Indo-Chinese in the English and German sense. This French term entered English in 1931 when Jean Przyluski and Gordon Luce co-authored an article on the root for the numeral hundred in “Sino-Tibetan.” The new term did not catch on at once, but during the Great Depression in 1935 the American president Franklin Roosevelt instituted the employment scheme called the Works Progress Administration. Through this programme, the famous Berkeley anthropologist Alfred Kroeber, inspired by the enthusiasm of Robert Shafer, managed to raise funding for his Sino-Tibetan Philology project. Changing the name of the model of linguistic relationship to the new Gallic label helped to deflect the widespread criticism against Indo-Chinese.

Shafer effectively ran the project for Kroeber but saw two things fundamentally wrong with “Sino-Tibetan.” In 1938, Shafer proposed to remove Kradaï or Daic from the language family, but in the end he was not allowed to do so (Shafer 1955:97–98). Shafer also put Sinitic on par with other divisions in the family. The two operations would effectively have heralded a return to Julius von Klaproth’s original Tibeto-Burman model. After Paul Benedict came to Berkeley in the winter of 1938–1939 to join the project, he traded in the name Indo-Chinese for “Sino-Tibetan.” Moreover, after the conclusion of the project in 1940, he took credit for removing Daic (1942). Benedict (1972) also restored Sino-Tibetan to its original Indo-Chinese shape, again isolating Chinese as the odd man out.

Ironically, after the Cultural Revolution, Chinese scholars adopted as orthodoxy the Indo-Chinese model as it had been repackaged in America. Sino-Tibetan became 汉藏语系 *Hàn-Zàng yǔxì*, notwithstanding its empirically unsupported phylogeny and

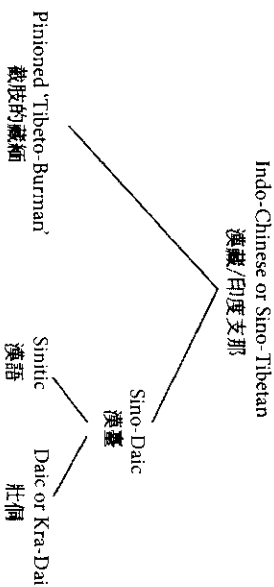


FIGURE 10.2 The Indo-Chinese or Sino-Tibetan theory: Kradaï or Daic has been excluded since the Second World War.

its racist legacy. Historically, Sino-Tibetan is rooted in the fact that morphosyntactic typology had perplexed less enlightened linguists of the 19th century into believing that Chinese and Thai represented an inferior developmental stage on a Steinthal's ladder of language evolution. This view relied on the assumption that Sinitic languages had never evolved and that Chinese had remained typologically unchanged and "without inflection, without agglutination" for millennia (e.g., Chalmers 1866).

By contrast, the informed historical linguistic view represented quite a different understanding of Chinese. Carl Richard Lepsius (1861:492–496) proposed that Chinese tones had arisen from the merger of initials and the loss of finals based on correspondences between Chinese and Tibetan. He argued that entire syllables had been lost in Chinese and that Chinese ideograms once represented words that may often have contained more than just the root syllables whose reflexes survive in the modern pronunciations. The view of Chinese promulgated by Lepsius later inspired Bernhard Karlgren (1920, 1957) to conceive of Old Chinese as a "langue flexionelle" and to undertake the reconstruction of Old Chinese in accordance with the principles of the comparative method.

Two models of phylogenetic relationship sought to defy the Sino-Tibetan paradigm propagated from Berkeley, that is, Sino-Himalayan (Bodman 1973, 1980) and Sino-Kiranti (Starostin 1994). Although neither proposal gained acceptance, these sales made the crucial point that to date no evidence has ever been adduced in support of the Sino-Tibetan phylogenetic model, defined by its truncated "Tibeto-Burman" taxon encompassing all non-Sinitic languages. Methodologically, attempts to define all non-Sinitic languages negatively in terms of Sinitic innovations that other languages lack or to invoke the argument of gross word order for Karen and Sinitic, as Benedict (1976) once did, are known to be phylogenetically meaningless. All comparative evidence amassed to date supports Julius von Klapproth's 1823 minimalist Tibeto-Burman tree, which epistemologically therefore continues to represent the default model.

However, the history of the field has left us with an unfortunate nomenclatural legacy. Whereas Tibeto-Burmanists in Klapproth's tradition used the name "Tibeto-Burman" for the family as a whole, Sino-Tibetanists have used the term "Tibeto-Burman" to denote all non-Sinitic languages as comprising a single taxon. In an attempt to escape this terminological morass, in 2004 the alternative name "Trans-Himalayan" was proposed for the linguistic phylum because the world's second most populous language family straddles the great Himalayan range along both its northern and southern flanks (van Driem 2007:226).

This neutral geographical term is analogous to "Indo-European" and "Afro-Asiatic" in reflecting the geographical distribution of the language family. The term "Afro-Asiatic" was coined in 1914 and replaced the earlier "Hamito-Semitic" for similar reasons. Hamitic was shown not to be a valid subgroup, just as Sino-Tibetan defined by its unitary non-Sinitic taxon likewise denotes a false tree. The linguistic phylum is genuinely Trans-Himalayan in distribution in that by far most of the roughly 300 different Tibeto-Burman languages and three-fourths of the major Trans-Himalayan subgroups are situated along the southern flanks of the Himalayas (Figure 10.3), while by far most speakers of Trans-Himalayan languages live to the north and east of the great Himalayan divide (Figure 10.4).

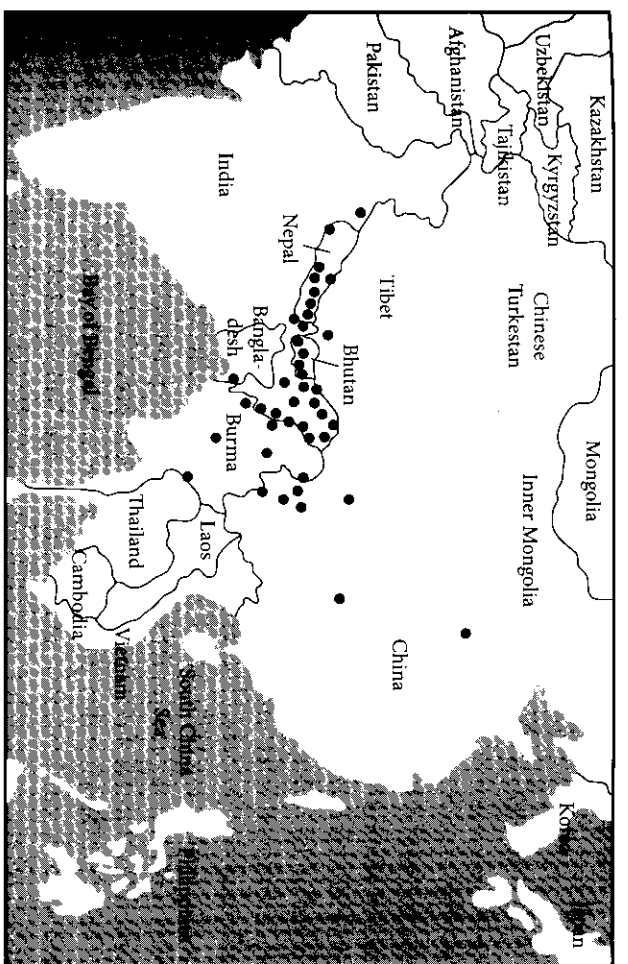


FIGURE 10.3 Geographical distribution of the major Trans-Himalayan subgroups. Each dot represents not just one language but the putative historical geographical centre of each of forty-two major linguistic subgroups.



FIGURE 10.4 Geographical distribution of Trans-Himalayan languages.

10.2 SUBGROUPS AND GEOGRAPHY

Much more is known about the Tibeto-Burman language family today than in the days of Klapproth. Today we can identify forty-two subgroups for which there appears to be evidence and about which there is some degree of consensus. The 2012 version model of the Fallen Leaves model, shown in Figure 10-5, contains a number of groups not mentioned when this model was first presented (van Driem 2001). The rGyaltronic subgroup was proposed and validated by Jackson Sun (2000a, 2000b). The Nàic subgroup, comprising Nāmuyi and Shixīng and the closely related Nàish languages (i.e., Nàxi [nɑhɿ], Na [nɑɿ] and Laze [lɑzɿ]) has been proposed by Jacques and Michaud (2011). Evidence for an Ersūish subgroup has been presented by Yu (2011).

Post and Blench (2011) presented evidence for Siangic, a group comprising Milang and Koro. At one level, Post and Blench envisage Siangic not as a Tibeto-Burman subgroup but as an altogether non-Tibeto-Burman phylum that has left vestiges in Koro and Milang. A more conservative stance would be to treat Koro and Milang together as a Tibeto-Burman subgroup in their own right. In a similar vein, many scholars have recently publicly aired the view that Puroik (or Sulung), normally deemed to be a member of the Kho-Bwa cluster of languages, is not a Tibeto-Burman language at all. Despite the apparently aberrant nature of some of the lexicon, Puroik, Koro, and Milang all exhibit a good

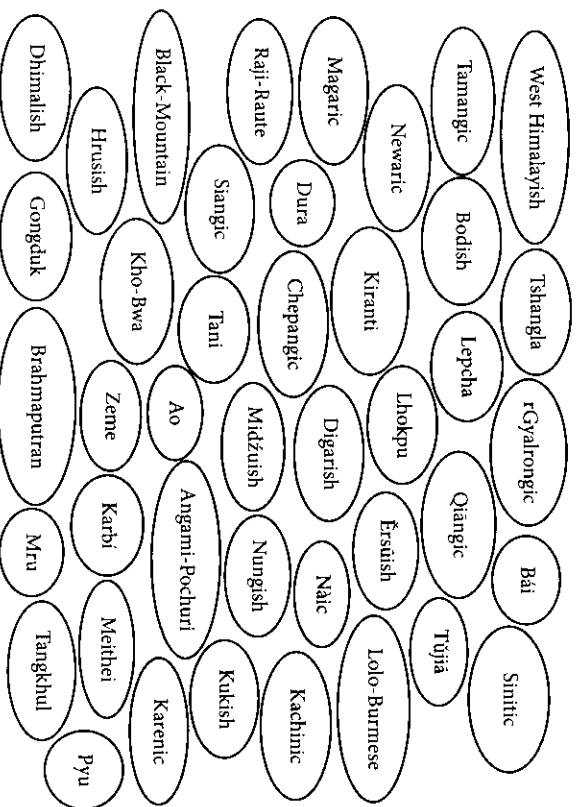


FIGURE 10-5 The 2012 version of the agnostic Fallen Leaves model. Thirty out of the forty-two Tibeto-Burman subgroups lie south of the great Himalayan divide, seven to the north and east of the Himalayas, and five (i.e., Tshangla, Bodish, Nungish, Lolo-Burmese, and Kachinic) on both sides of the Himalayas.

share of Tibeto-Burman vocabulary. The history of Indo-European is instructive in this regard.

French shows a smidgen of Celtic lexicon that can be viewed as substrate, while the language itself is indisputably a Romance dialect. Words borrowed from the substrate language do not determine the linguistic affinity of a language. Until Ritter von Xylander (1835), Albanian was held to be a language isolate in Europe just like Basque. It is sobering to reflect that less is known today about Tibeto-Burman historical grammar than was known in 1835 about Indo-European historical grammar. The Gongduk language in Bhutan is analogous to Albanian or, for that matter, much like Koro, Milang and Puroik, in exhibiting much vocabulary that appears outlandish from a Tibeto-Burman perspective. Yet our perspective on Tibeto-Burman has been changing rapidly in recent years, as more becomes known about the less well documented languages of the phylum. Our understanding of what Starostin called “Tibeto-Burman in the narrow sense”² is broadening to encompass a more informed and fine-mesh view.

The growing awareness in the field that the Tibeto-Burman analogues of Armenian, Hittite, and Albanian all appear to be found within the eastern Himalayas highlights the fact that the language family’s centre of phylogenetic diversity lies squarely within the eastern Himalayas. The lexical diversity observed in many subgroups of the eastern Himalayas is just one residue of a complex and many-layered ethnolinguistic prehistory in a region of ancient human habitation.

The whereabouts and the names of the languages in the forty-two leaves that have fallen from the Trans-Himalayan tree are listed in the following. The most obvious disambiguations are indicated with the symbol ≠ with additional elucidation. Realities on the ground are far more complex than any short list can show. Related but entirely distinct and mutually unintelligible languages sometimes go by the same name (e.g., Magar, Limbu, Chinese). So the roughly 280 language labels in this non-exhaustive list obscure a great deal of dialectal and linguistic diversity. Terms in brackets represent alternative names by which the languages are also known.

Sometimes the ethnic designation and the mother tongue do not match, as when a community, for example, considers itself Jingpō but speaks the Lolo-Burmese language Zaiwa or considers itself Tibetan but speaks a rGyaltronic language. Some languages are extinct (e.g., Pyu, Dura), believed to be extinct (e.g., the Sak languages) or moribund (e.g., Barām). In fact, most Tibeto-Burman languages are endangered with imminent extinction. A more detailed account can be found in the ethnolinguistic handbook *Languages of the Himalayas* (van Driem 2001) and in the literature referenced therein.

Angami-Pochuri (southern Nagaland, northern Manipur, neighbouring portions of Burma and Assam): Angami, Chokri [Chakri], Kheza, Mao [Sopvoma], Pochuri, Ntenyi, Maluri [Meluri], Sema, Rengma, Kezhama, Senkadong

Ao (central Nagaland and neighbouring portions of Burma): Yacham, Ao Chungli, Ao Mongsen, Yimchungrüt [Yachumil], Sangam [Thukumil], Yacham, Tengsa, Lotha [Lhotal]

- Bái* (the area around Dali in Yunnan province): Bái
- Black Mountain Mōngpa* (the Black Mountains of Bhutan): Olekha, Riti, Jangbi, Wangling
- Bodish* (Tibet, Pakistan, India, Nepal, Sikkim, Bhutan): Balti, Purik, Ladakh, Zanskar, Lahul, Central Tibetan (dBus and Tsang), Sherpa, Ölmo Sherpa, Lhomi, Jirel, Kagate, Mustang, Limirong, Mugu, Northern Kham, Eastern Kham, Amdo Tibetan, Brokpa, Dzongkha, Lakha, Dränjöke, Cho-ca-nga-ca-kha, Bunnthang, Kheng, Mangde, Kurtöp, Chali, Dzala, Dakpa
- Brahmaputran* [i.e., Bodo-Koch plus Northern Nagal (West Bengal, Assam, Meghalaya, Arunachal Pradesh, northern Nagaland and adjacent portions of Burma): Chutiya, Kokborok, Tiwa, Dimasa (Hills Kachādi), Bodo, Plains Kachādi, Meche, Garo, Along, Pani Koch, Ruga, Rabha, Tangsa, Nocte, Wancho, Kuwa, Haimi, Hangan, Konyak, Poryo, Phom, Chang, Welam, Nokaw
- Chepangic* (central Nepal): Chepang, Bhujeli
- Dhimalish* (eastern Nepalese Terai, western Bhutanese duars): Dhimal, Toto
- Digarish* [Northern Mishmi] (Dibang River valley, Lohit district, Arunachal Pradesh): Idu, Taraon [Digaro]
- Dura* (central Nepal's Lamjung district): Dura
- Érsüish* (southern Sichuān, northern Yunnan): Érsü, Tosu, Lizu
- Gongduk* (south-central Bhutan): Gongduk
- rGyalrongic* (southern Sichuān): Situ, Japhug, Tsobdun, Zbu, Lavrung (including Thurje Chenmo, and nDzorogs), Horpa (including rTau and Stod-sde)
- Hrusish* (western Arunachal Pradesh): Hruso [Aka], Dhimmai [Mijit], Levai [Bangru]
- Kachinic* [Jinghpaw] (northeastern India, northern Burma, southern Yunnan): The various Kachin, Singpho, Jingpō, or Jinghpaw languages and the Sak [Luish] languages Sak, Kadu, Andro, Sengmai, Charrel
- Karbi* [Mikir] (Mikir Hills or Karbi Anglóng, neighbouring districts of Assam): Karbi [Mikir]
- Karenic* (lower Burma, the Tenasserim, and adjacent Thailand coastal regions): Paò, Pwo, Sgaw, Kayah, Brek [Bwe], Bghai
- Kho-Bwa* (western Arunachal Pradesh): Khowa [Bugun], Sherdukpen, Puroik [Sulung], Lishpa
- Kiranti* (eastern Nepal): Päñthare Limbu, Pheadäppe Limbu, Tamarkhole Limbu, Chathare Limbu, Yakkha, Chiling, Añphaharivā (including Behare), Lohorung, Yampbu, Mewahang, Kulung, Nachiring, Sampang, Sam, Chamling, Puma, Bartawa, Chintang, Dungmali, Thulung, Jero, Wambule, Tilung, Dumi, Khaling, Kohi, Bahing, Sunwar, Hayu
- Kukish* [Mizo-Kuki-Chin] (Mizoram and the Indo-Burmese borderlands): Mizo [Lushai], Lai, Siyin, Thado, Tiddim Chin [Paite a.k.a. Sokte a.k.a. Kamhau], Haka,

- Chinbok, Laizo, Laker, Ashö, Khumi Chin, Hmar, Anal, Laker [Mara], Falam, Vaypei, Lamgang, Simte
- Lepcha* (Sikkim, Darjeeling, Kalimpong): Lepcha
- Lhokpu* (southwestern Bhutan): Lhokpu [Doyal]
- Lolo-Burmese* (southwestern China, Burma, Southeast Asia): Burmese, Zaiwa (≠ Midzuish Zaiwa) [Atsil, Lāshi, Māru (≠ Mru in the Chittagong), Maingtha [Achang a.k.a. Ngachang], Hpon [Hpun], Dānu, Taungyo [Tāru (≠ Danaw)], Phunoi, Akha, Lahu, Lisu, mbisu, Ahsi, various Yilanguages
- Magaric* (central Nepal): Syāngiā Magar, Tanahū Magar, Palpā Magar, Khām Magar [Kham (≠ Tibetan Kham)]
- Meithei* (Manipur): Meithei [Manipuri]
- Pyu* (extinct language of pre-Burmese epigraphy in Burma): Pyu
- Midzuish* [Southern Mishmi] (Lohit drainage, Lohit district, Arunachal Pradesh): Kaman [Miju a.k.a. Mijhu], Zaiwa (spoken by the Meyöl clan near Walong ≠ Burmic Zaiwa)
- Mru* (in the Chittagong of Bangladesh): Mru [Māru] (≠ the Shan State Māru in Burma)
- Nāic* (southern Sichuān, northern Yunnan): Nāmüy, Shixing, Nāxi, Na, Laze
- Newaric* (central Nepal): Kāhmandu Newar, Pahari Newar, Badikhel Newar, Chitlang Newar, Dolakha Newar, Barām, Thangmi
- Nungish* (Yunnan province, northern Burma): Trung, Alóng, Rāwang, Róuruò, Nung including Nüsū and Anü (≠ the Daic Nung in northern Vietnam)
- Qiāngic* (southern Sichuān, northern Yunnan): Southern Qiāngic, Northern Qiāngic, Mi-fāng (Müyā), Primmi (Pümü), Choyo (Quèyü), Tangut (Xixià), Zhābā, Èrgōng, Guìqióng
- Raji-Raute* (western Nepal, Uttarakhānd): Raji, Raute
- Siāngic* (Arunachal Pradesh): Koro, Milang
- Sinitic* (China): Mandarin, Cantonese, Wú, Gān, Xiāng, Hakka [Kéjiā], Southern Min (including Hokkien), Eastern Min, Northern Min, Central Min
- Tamāngic* (central Nepal): Tamang, Gurung, Thakali, Chantyal, Ghale, Kalke, Nāpa, Manāngba
- Tāngkhul* (northeastern Manipur, neighbouring parts of Burma): Tangkhul, Maring
- Tani* [Abor-Miri-Dafā] (Arunachal Pradesh, neighbouring portions of Assam): Apatani, Nyisu, Bengni, Nishing, Tagin, Yano, Sarak [Hill Miri], Galo, Bokar, Ramo, Ashing, Palibo [Libo], Danu, Bori, Mishing [Plains Miri], Padam, Shimong, Pasi, Panggi, Tangam, Karke, Minyong
- Tshāngla* [Shāchop] (eastern Bhutan, enclaves in Arunachal Pradesh and Tibet): Tshāngla [Shāchop or loconyms], Bjokapakha, Dirang Tshāngla
- Tüjiā* (Hünán, Hübéi and Guizhōu provinces): Tüjiā

West Himalayish (Himachal Pradesh, Uttarakhand): Manchad, Tinan, Bunan [Gari], Kanashi, Rangpo, Darma, Byangsi, Rangkas, Zhangzhung

Zeme (southwestern Nagaland, northwestern Manipur, neighbouring portions of Assam): Mizieme, Liangmai [Kwoireng], Zeme [Empeo Naga a.k.a. Kacha Naga], Maram, Khoirao, Puitron, Rongmai [Kabui a.k.a. Nruanghmei].

Some of the subgroups in this list of forty-two fallen leaves represent tentative subgrouping hypotheses that have yet to be subjected to closer scrutiny (e.g., Newaric, Qiangic). By the same token, questions arise such as whether Bodish should include East Bodish as well as Bodish proper and how East Bodish should otherwise be renamed, or whether Brahmaputran should encompass both the Bodo-Koch as well as the Northern Naga languages. In historical linguistics, it is preferable to work from the bottom up, that is, starting with the tangle leaves that have fallen from the tips of the branches and then moving upward to gain an understanding of the nodes in the tree. Yet many Tibeto-Burman languages are still poorly documented and scantily described.

10.3 INTERNAL PHYLOGENY AND HIGHER-ORDER SUBGROUPING

The Fallen Leaves model is no definitive phylogeny by definition. Though agnostic about higher-order subgrouping, the model does not deny that there is a family tree whose structure must be ascertained by historical linguistic methods. The continuing identification of subgroups presents a challenge to the current generation and to future generations of historical linguists to reconstruct the internal phylogeny of Tibeto-Burman on the basis of reliable data and regular sound laws and not to accept false family trees that we inherit from our predecessors or find in the literature without the support of historical comparative evidence. Two of Shafer's (1966–1974) old "divisions" continue to lead robust lives of their own as higher-order albeit vaguely delineated subgrouping proposals (i.e., Bodic and Burmic).

Recently, Jacques and Michaud (2011) have proposed a higher-order subgroup called Burmo-Qiāngic, comprising Lolo-Burmese and a subgroup newly christened Nà-Qiāngic. Nà-Qiāngic essentially represents the same catch-all that used to be called "Qiāngic." This constellation of subgroups has now been rendered less nebulous, however, by Sun (2000a, 2000b), Yu (2011), and Jacques and Michaud (2011), who have validated the rGyalrongic, Érsuish, and Nàic subgroups, respectively. In addition to these three subgroups, Nà-Qiāngic also contains Mi-nāg (Mùyǎ), Primmi (Pǔmǐ), Choyo (Quèyǔ), Tangut (Xìxià), Zhābā, Qiāngic *sensu stricto*, and perhaps Èrgōng and Guìqióng. The internal phylogeny of the latter medley of subgroups still has to be worked out, and the higher-order subgrouping hypotheses Nà-Qiāngic and Burmo-Qiāngic likewise require validation.

Another higher-order subgrouping hypothesis, Sino-Bodic, has a long history. Julius von Klapproth (1823) observed that Tibetan and Chinese appeared to be more closely related to each other than either were to Burmese. Simon (1927, 1928, 1929) and Forrest (1956, 1962) adduced lexical evidence that suggested a closer relationship between Chinese and Tibetan within the family. Although Shafer criticized Simon's work, Shafer (1955) too observed that a closer genetic affinity obtained between Sinitic and Bodic than between any other two divisions. Later Bodman (1973, 1980) too adduced evidence indicating a closer relationship between Sinitic and Bodic. The name "Sino-Bodic" was proposed for the hypothesis, and additional lexical evidence for this affinity was presented (van Driem 1997). Matisoff (2000) protested, but most of the Sino-Bodic evidence still stands (van Driem 2005). Possible new evidence for Sino-Bodic has been adduced by Nathan Hill (2011) and Zhèngzhāng (2011). Future research will determine whether any of these supergroups will survive the test of time.

NOTES

1. Hodgson's correspondence is kept at the Royal Asiatic Society in London.
2. *tibeto-birmanskij v uzkom smysle*.

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CHAPTER 11

CHINESE DIALECTS

DAH - AN HO

11.1 GEOGRAPHICAL DISTRIBUTION

The most observable geographical boundary in classifying Chinese dialects is *Changjiang* (the Yangtze River). North of Changjiang is Mandarin (Guanhua)-speaking while south of it is non-Mandarin-speaking. This classification, however, is only an approximation. In fact the distribution of Mandarin has gone beyond Changjiang for at least a millennium. For example, the Nanjing speech spoken on the south bank of Changjiang is a subvariety of Mandarin. Mandarin is also spoken in most part of Sichuan and Yunnan, which stand across both the north and south bank of upstream Changjiang. The non-Mandarin-speaking areas south of Changjiang are increasingly shrinking. In many cities Mandarin spoken with a regional accent is used as a lingua franca, the so-called regional variant (*xiangyin bianqi*, 乡音变体) of Mandarin. This phenomenon has existed for at least centuries. The promotion of Putonghua in the past few decades has further accelerated the loss of non-Mandarin dialects.

The vast distribution of Mandarin can be attributed to the following. First, for several dynasties China's political and cultural center were mostly located in the north, except during some brief periods. It follows naturally that northern dialects often became the prestigious language with nationwide influence. This was especially the case for about a thousand years after the formation of Mandarin. Second, long-term garrison forces and large-scale immigration lasted for almost six centuries during the Ming and Qing Dynasties. These two official policies turned many provinces in southwestern, northwestern, and northeastern China into Mandarin-speaking areas, including Yunnan, Guizhou, Sichuan, Liaoning, Jilin, Heilongjiang, Gansu, and Xinjiang. Furthermore, wars, refugees, and spontaneous migration have also contributed to the diffusion of Mandarin.

Non-Mandarin areas are all situated south of Changjiang. Wu is spoken in Shanghai, Zhejiang, and the Jiangsu province south of Changjiang; Min in Fujian and Taiwan; Yue in Guangdong and Guangxi; Xiang in Hunan; Hakka in the borders of Jiangxi, Fujian,

and Guangdong as well as in Taiwan; Gan in Jiangxi; Hui in the Anhui province south of Changjiang; Pinghua in Hunan and Guangxi. Note that this description fails to capture accurately the realistic distribution since dialect boundaries do not always correspond to administrative divisions.

Jin is spoken in Shanxi and Inner Mongolia Autonomous Region. Historically it shares a similar source with Mandarin, so strictly speaking it can hardly count as non-Mandarin. In addition to Jin, whose exact status is disputed among linguists, both Hui and Pinghua are also recognized as separate branches of Chinese only recently (Wurm et al. 1988; Cao 2008).

In addition to large-chunk distributions, there are numerous fragmented and scattered dialect settlements, such as the Hakka in Sichuan and the Min in Guangdong, Guangxi, and Hainan. These isolated dialect settlements are called dialect islands in dialectology (Figure 11.1).

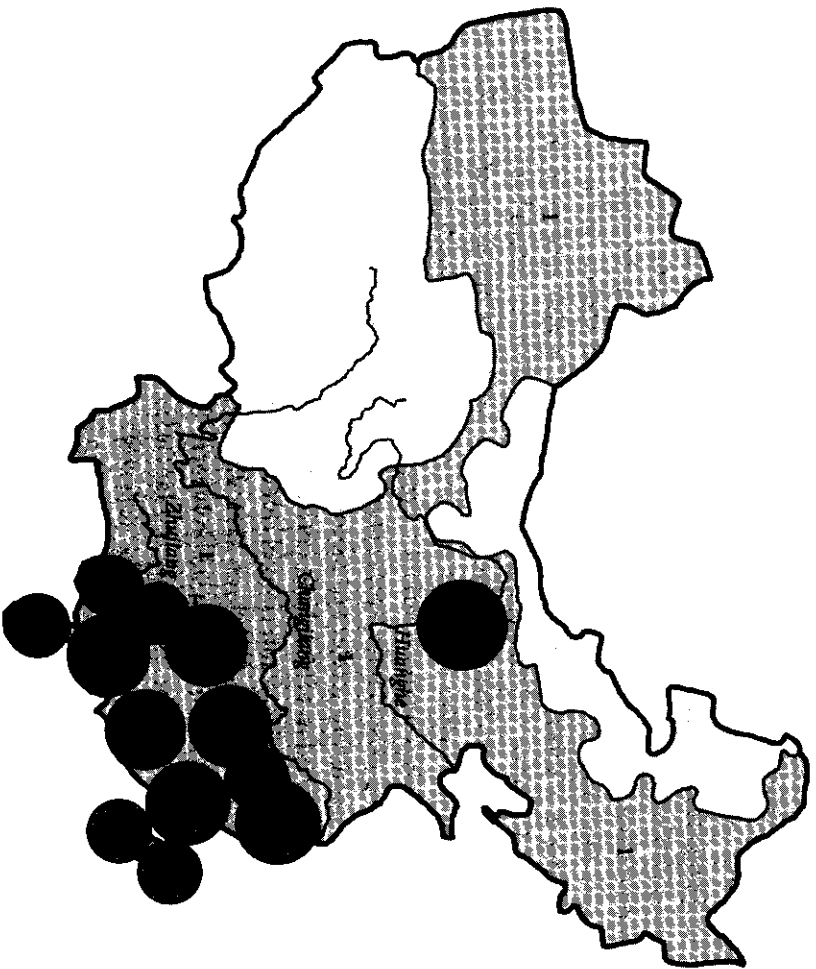


FIGURE 11.1 Distribution of Chinese dialects

The region enclosed within the thicker line is where Chinese dialects are spoken. The three rivers from north to south are *Huanghe*, *Changjiang*, and *Zhujiang* (The Pearl River). The circles represent distribution areas, while the number inside indicates, respectively, 1. Mandarin, 2. Wu, 3. Hui, 4. Min, 5. Gan, 6. Hakka, 7. Xiang, 8. Yue, 9. Pinghua, and 10. Jin.

11.2 THE FORMATION OF DIALECTS: FROM THE PERSPECTIVE OF DEMOGRAPHIC DYNAMICS

The absolute existence time for any Chinese dialect is as long as the history of the Chinese language. What discriminates these dialects from one another are the changes they have gone through and the speed of their change. Some dialects are characterized by the retention of old linguistic features, while others are characterized by more innovations. The primary factor that causes variation in the content and speed of change is the kind of dialect contact or language contact induced by demographic mobility.

The mobility of the Chinese people has unique characteristics. First, China has long been an agricultural country. The levies and taxes paid by farmers were a major source of national finance. Farmers had to be registered in the census records of their location and controlled for residency in order to guarantee government revenue (called household registration, *bianhu*, 编户). Household registration was constrained by land and tax so that free migration was not allowed. Nonetheless, in order to open up primitive country, guard the frontier, strengthen the population of the capital, or to send criminals to exile, the government also frequently and extensively forced people to move, resulting in varying degrees of mixed settlements of different social and ethnic origins. Such demographic mobility is termed the resettlement model (*ximin moshi*, 徙民模式). What is best known about this resettlement model is the establishment of four prefectures to the west of *Huanghe* (the Yellow River) along the Silk Road (*Hexi si jun*, 河西四郡). Prior to 200 BCE, this region was originally populated by the non-Han *Yuezhi* 月氏 (an ancient Central Asian people that lived between 3rd century BCE to 1st CE). The *Yuezhi* were later expelled by the *Xiongnu* 匈奴 (ancient nomadic-based people that formed a confederation north of the Chinese empire of the Han Dynasty) and migrated to Central Asia. The Han dynasty later took possession of their original territory. Cities and towns were established there, and farmers and criminals were recruited from all over the empire to reside in these districts. They were given special deduction in tax and commutation for penalties and settled down as registered households. Evidently new dialects came to be formed in this manner, and this is the principal way of dialect formation in times of peace.

In times of war or during crop failure, a great many people fled from their registered residence and settled down in more peaceful and stable regions. This kind of population mobility is not forced by the government and comes to be called the refugee model (*liumin moshi*, 流民模式). A lot of such mobility involves large-scale and organized migrations of the entire village or clan. Regarding dialect formation, the refugee model involves two diverse situations. First, if the regions where the refugees were settled already had registered households of the Han Chinese, the newly moved-in refugees were called guest households (*kehū*, 客户). Guest households could do farm work only

in discarded or undeveloped lands, resulting in the formation of new settlements outside the urban areas and bringing about dialect contact for these areas with new residents. Second, if registered households of the Han Chinese were absent and only indigenous non-Han people were present, the dialects of the newly settled Han Chinese were transplanted. As time went by, due to land development by the moved-in Han Chinese and a natural increase of the population, the transplanted dialects of the Han people had close contact with the indigenous non-Chinese languages. The refugee model is hence the principal way of forming new dialects in times of war or of natural disasters such as draught or floods.

The third is an invasion model (*rujin moshi*, 入侵模式). China was constantly invaded by the northern and western non-Han people since historic times. These invasions brought about wars as well as ethnic mixture. The invasion model denotes such population mobility driven by the invasions of these non-Han people. One characteristic of this model is that a relatively large number of people from the invading ethnic group came to be settled in Han areas and were eventually sinicized. Although they shifted to speaking the Chinese language, many non-Chinese linguistic elements entered their Chinese and became new features of the language.

In addition to the three aforementioned models of migration, we should also pay attention to social mobility within the whole country. In the Chinese empire before the 10th century CE, spatial movement of the population was limited, and the channels for, and dimensions of, social mobility were insufficient and restricted. After the 10th century CE, thanks to the prosperity of merchandise economy, the promotion of the imperial examination system (*keju zhidu*, 科举制度), and the invention of printing, which led to the flourishing of educational and cultural enterprises, social mobility increased extensively and stimulated interaction and mutual influence among different dialects. One effect of such exchange was the appearance of a literary reading in many modern dialects.

The formation of modern Chinese dialects can generally be attributed to the different types of demographic dynamics described earlier. However, the formation process of each dialect may involve more than one route. Specifically, all modern dialects are formed under the interaction of several factors identified previously, the only difference being the duration and extent of such interactions.

11.3 PHONOLOGICAL CHARACTERISTICS

Among the Chinese dialects, differences in syntax and morphology are relatively insignificant. What best distinguishes these dialects are their phonological characteristics. The following are some features that can be employed for comparison (Ting 1982; Norman 1988):

- (1) The evolution of ancient voiced initials (*quanzhuo shengmu*, 全浊声母) *b-, *d-, *g-, etc.
- (2) The evolution of ancient stop codas *p-, *t-, *k-

- (3) The evolution of ancient tones *A (*ping* 平, even or level), *B (*shang* 上, rising), *C (*qu* 去, departing) and *D (*ru* 入, entering).

For comparison of these features please refer to Table 11.1. Some other particular features are also mentioned frequently as characteristics that typify a certain dialect group. A few examples are the nondistinction between bilabials

Table 11.1 Comparison of phonological traits

| | Initials *b-, *d-, *g-, etc. | Final stops *p-, *t-, *k | Tones *A, *B, *C, *D |
|-----------------|--|---|--|
| Mandarin | Devoiced to ph-, th-, kh- (even tone) or to p-, t-, k- (rising, departing and entering tones) | Lost or reduced to -ʔ | *A split into two registers <i>yin</i> 阴 (dark) and <i>yang</i> 阳 (light); *D got lost. Basically four tones are identified. |
| Mu | b-, d-, g- | Reduced to -ʔ | *A, *B, *C and *D all split into the dark and light register. Basically seven or eight tones are identified. |
| Hui | Devoiced to ph-, th-, kh- (majority) or to p-, t-, k- (minority) | Lost or reduced to -ʔ | *A, *B, *C and *D all split into the dark and light register. Basically four to eight tones are identified. |
| Min | Devoiced to p-, t-, k- (majority) or to ph-, th-, kh- (minority) | -p-, -t-, -k, -ʔ | *A, *B, *C and *D all split into the dark and light register. Basically seven or eight tones are identified. |
| Gan | Devoiced to ph-, th-, kh- | -p-, -t-, -k, or lost; or reduced to -ʔ, -t- | *A, *B, *C and *D all split into the dark and light register. Basically five to seven tones are identified. |
| Hakka | Devoiced to ph-, th-, kh- | -p-, -t-, -k | *A, *B, *C and *D all split into the dark and light register. Basically five or six tones are identified. |
| Xiang | b-, d-, g-, or devoiced to p-, t-, k- | Lost | *A split into the dark and light register; *D got lost. Basically four to six tones are identified. |
| Yue | Devoiced to ph-, th-, kh- (even and rising tones), or to p-, t-, k- (departing and entering tones) | -p-, -t-, -k | *A, *B, *C and *D all split into the dark and light register; *D split into three or four tones. Basically seven to twelve tones are identified. |
| Pinghua | Devoiced to p-, t-, k- | Lost (in the north) or became -p-, -t-, -k (in the south) | *A split into the dark and light register; *D got lost. Basically four to six tones are identified (in the north); *A, *B, *C and *D all split into the dark and light register; *D split into three or four tones. Basically seven to twelve tones are identified (in the south). |
| jin | Devoiced to ph-, th-, kh- (even tone) or to p-, t-, k- (rising, departing and entering tones) | Reduced to -ʔ | *A split into the dark and light register (majority). Basically four to six tones are identified. |

and labiodentals (*bang fei bu fen*, 帮非不分),¹ as well as the nondistinction between alveolars and palatals (*duan zhi bu fen*, 端知不分)² in Min, the change of the rising tone to the dark even tone for secondary voiced (sonorants) initials (*cizhuo shangsheng gui yinping*, 次浊上声归阴平)³ in Hakka; and the syllable division words (*fenyin ci*, 分音词)⁴ in Jin. Scholars often disagree as to which features are representative and whether they can be applied to the classification of dialect groups.

11.4 DIALECT HISTORY: FROM THE PERSPECTIVE OF EVOLUTION RATE

Evolution of dialects means the loss of old features and the introduction of new innovations. The degree of an innovation, or preservation, becomes a criterion that can be used to measure the evolution rate. For instance, the nondistinction between bilabials and labiodentals and that between alveolars and palatals, and the *ge*-group words read as *-a* (*gebu zi du a*, 歌部字读-a)⁵ in Min, are all archaic features that characterize Old Chinese (Ting 1983). All other dialects no longer preserve these traits. Therefore, in terms of these characteristics, Min is the most preservative dialect and can be traced to the language of 2,000 years ago. Other dialects are more innovative, and their formation must be subsequent to that of Min.

Based on such a viewpoint, it is fair to claim that Mandarin dialects are more innovative, while non-Mandarin dialects are more conservative. That is to say, the evolution rate of Mandarin is faster than that of non-Mandarin. Among the non-Mandarin dialects, the speed of change varies depending on the phonological characteristics in question. In the evolution of ancient voiced initials *b-, *d-, *g-, and so on, Wu is the slowest, Xiang is the second slowest, followed by other dialects. In the evolution of ancient stop codas *p-, *t-, and *k-, Hakka and Yue are the slowest, Min and Gan are the second slowest, and other dialects follow. In the evolution of ancient tones *A (even), *B (rising), *C (departing), and *D (entering), Wu and Min are slower than all the other dialects. Together with evidence from the history of the Chinese language, we can infer that some preserved traits of Min have the greatest time depth and can be traced to ancient times. Others traits of Wu, Yue, Hakka, and Gan developed later, while those of Hui and Pinghua came still later, corresponding respectively to early and late Middle Chinese. The preserved traits of Mandarin are hence the most recent, with a time depth equivalent to early modern times, that is, after the 10th century CE.

The reason the Mandarin dialects evolved faster than the non-Mandarin is Mandarin-speaking areas were subject to frequent and drastic blending processes with the invading non-Han ethnic groups. According to historic documentation, it is speculated that such fusion had undergone immense impact within an extremely short period of time. In consequence, dialects with single inheritance retain the most ancient traits, while those with pluralistic fusion processes are the most innovational.

One point that needs to be borne in mind is that all of the southern Chinese dialects were brought to their present areas by the northern immigrants in different eras. The encounter between new and old residents may have involved divergent spatial movements and gives rise to various possibilities of linguistic blending. Consequently, just as today's distribution does not necessarily correspond to the initial distribution, the dialects today may not be equivalent to the dialects in former days. Take Min as an example: multiple evidence reveals that early distribution of Min was further north than where it is distributed today, whereas the origin of some varieties of the Wu dialects spoken today might have been the native land of Min. Another example can be noted in some phonological traits of Hakka, which are found sporadically across a large territory in the Central Plains and south of Changjiang, where Hakka is not spoken currently; thus the early distribution of Hakka must have comprised a much larger terrain than today.

11.5 DIFFERING LITERARY AND COLLOQUIAL READINGS

In many documents about the Chinese dialects, it is mentioned that a single sinogram has differentiated readings, one literary and the other colloquial. This phenomenon is generally called differing literary and colloquial pronunciations (*wen bai yi du*, 文白异读). For instance, many ancient entering-toned words in Pekingese have diverse literary and colloquial pronunciations, as exemplified in Table 11.2:

Differing literary and colloquial pronunciations are a result of dialect contact and reflect the coexistence of native and foreign pronunciations. The literary readings of Pekingese in Table 11.2 represent the native pronunciation, while the colloquial readings originate from other dialects (Ting 2006).

Pekingese has the fewest examples of differing literary and colloquial readings among the Chinese dialects. Non-Mandarin dialects typically have more such instances. Their examples are not only numerous, but detailed analyses into them may even bring to light divergent phonological systems. Since Beijing is a long-time capital, its doublets of readings can be ascribed to the natural flow of population into the first city. The doublets in non-Mandarin regions are instead a result of education and instruction. With the promotion of imperial examinations, the literary language based on Middle Chinese

Table 11.2 Differing literary and colloquial pronunciations in Pekingese⁷

| | 熟 | 剝 | 学 | 白 | 勒 | 色 |
|--------------------|-------|-------|--------|-------|-------|-------|
| Literary reading | su 2 | po 1 | ɕye 2 | po 2 | lɿ 4 | sɿ 4 |
| Colloquial reading | sou 2 | pau 1 | ɕiau 2 | pai 2 | lei 1 | gai 3 |

was gradually diffused across the empire from the 7th or 8th century on. Therefore, the more a dialect diverged from this literary language, the more it had to learn and adopt. The distinct phonological systems underlying the literary and colloquial reading in Min demonstrate the great distance that separates it from the literary language. In some dialects, differing literary and colloquial pronunciations involve more than two pronunciations, since they are influenced not only by the national literary language but also by the regional *lingua franca*.

The idea that a single sinogram may have different pronunciations implies the existence of dialect contact and dialectal strata. In fact, not only does dialect contact play a role here but contact with non-Han languages leaves traces as well. For instance, some dialects of Wu, Min, Gan, Yue, and Pinghua have implosives [ɓ] and [ɗ]. Such a phonetic feature actually reflects Tai-Kadai substrate. Both differing literary versus colloquial readings as well as linguistic strata have profound linguistic implications. Comprehensive investigation into these aspects will definitely enrich our understanding of the history of Chinese dialects (Ting 2007).

11.6 LEXICAL AND SYNTACTIC DIFFERENCES

A closer look at the lexical differences reveals the diversity of the Chinese dialects (Cao 2008). Take the high-frequency personal pronouns as an example; the pronouns for first-, second-, and third-person singular are *wǒ/nǐ/tā* 我/你/他 in Mandarin, *ngu/nong/hi* 我/侬/伊 in Wu, *gua/li/i* 我/汝/伊 in Min, and *ngai/ngi/ki* 厝尔/渠 in Hakka. Another instance concerns the commonly used verbum dicendi *shuo* 说 'to speak' in Mandarin. In Wu, Hui, Min, Yue, Xiang, and Pinghua the verb 讲 is used, while in Gan and Hakka the counterpart verb is 话. Three points deserve our special attention here. First, in both vocabulary and phonology, many southern dialects have preserved more ancient features in comparison with Mandarin. The word *guo* 锅 in Mandarin for a cooking vessel is actually a recent usage. Wu, Yue, and Hakka use the sinogram 镬 to denote the same cookware, whereas in Min the equivalent noun is *tiann* 鼎, both words coming directly from Old Chinese. Similarly, Mandarin uses the word *jiao* 脚 for "foot," while in Min it is *kha* 𪗇, which has an older origin than *jiao*. Second, although occasionally the same words are used across different dialects, the southern dialects retain the archaic meanings of the words. For instance, the equivalent verbs in Min for the Mandarin *zou* 走 'to walk' and *pao* 跑 'to run' are *kiam* 行 and *tsau* 走, respectively. This Min usage dates back to ancient times. Finally, although disyllabification is a common tendency in the development of Chinese lexicon, this process proceeds obviously more slowly in southern dialects. Whereas Mandarin uses the disyllabic words *yifu* 衣服 and *xifan* 稀饭 for "clothes" and "congee," Min still uses monosyllabic words *sann* 衫 and *mue* 糜. More examples include *kuazi* 筷子 'chopsticks' in Mandarin but 箸 in Wu, Min, and Pinghua; *bozi* 脖子 'neck' in Mandarin but 頌 in Gan, Hakka, Yue, and Pinghua; *shetou* 舌头 'tongue' in Mandarin but simply 舌 in Gan and Min and 𪗇 in Yue; *zuiha*

嘴巴 'mouth' in Mandarin but *tshui* 𪗇 in Min and *zoi* 𪗇 in Hakka. In these last four examples, Mandarin achieves its disyllabification by adding a suffix. Southern dialects, by contrast, are characterized by the absence of such suffixation.

Diminutive suffixes abound in Chinese dialects, but each dialect behaves differently with its own unique characteristics. Mandarin-speaking areas resort more to suffixes like *-zi* 子 or *-er* 兒, with further processes of retroflexion or rhotacization. Sometimes this phonological process of adding an *r*-coloring sound at the end of a syllable is also accompanied by variation in tones and in finals, which are generally referred to as tone change (*biantiao*, 变调) or rime change (*bianyun*, 变韵). In Wu a nasal ending is added for the same purpose, which often results in the further nasalization of finals. Min uses the suffix *-a* ㄚ while Yue takes advantage of tone sandhi. Let's cite the popular card game *mahjong* 麻将 as an instance. It is derived from adding a diminutive nasal coda to the word 麻雀 'sparrows' to get [mɯ tsiaʔ ŋ], which is the original name for the game in Wu. The game was originally called this because of the design of sparrows on the tile.

Syntax in Chinese does not vary significantly among the dialects. The major divergence usually consists in the choice of grammatical markers and word order. To begin with, aspect markers are differently represented in the south and north. For example, while Mandarin can employ *-zhe* following the verb to indicate a progressive meaning in *chi-zhe* 吃着 'be + eating' in Xiang, Gan, and Min the same progressive meaning is expressed through the preverbal form *zai* in *zai chi* 在吃. Mandarin has the suffix *guo* attached to the verb for experiential perfective as in *guo* 去过 'have been to', but in Min, some varieties of Hakka, and Yue, the grammaticalized verb "to have" is used as an auxiliary as in *yougu* 有去. Next, in some constructions word order difference is remarkable. In Mandarin adverbs precede verbs, as in *ni xian qu* 你先去 'you go first', but in some dialects of Wu (such as in Wenzhou), Hui, Gan, Yue, and Pinghua the same adverb 先 'first' follows the verb to become 你/依去先. In the comparative construction, it is customary in Mandarin to use the morpheme *bi* as in *wǒ bǐ nǐ gāo* 我比你高 (I-BI-you-tall) 'I am taller than you,' but in Yue and Pinghua 过 is attached to the stative verb to yield the sentence 我高过你, for example, *ngo gou gwo nei* (I-tall-GUO-you). Gan uses another morpheme 似 in the same position as in 我高似你 (I-tall-SI-you) while in some varieties of Min the same construction is expressed by means of the morpheme *kha* preceding the verb, for example, *gua kha kuan li* 我较高汝 (I-KHAH-tall-you).

11.7 NOT EASILY CLASSIFIABLE DIALECTS

Among the Chinese dialects, some are still not easily classifiable, including the Cunhua 村话 and Junhua 侬话 in Hainan, the Tuhua 土话 in northern Guangdong, the Waxiang 瓦乡话 in western Hunan, the Tuhua in southern Hunan, and so forth. One characteristic that these dialects all share is that they have very few native speakers. Their relationship with the neighboring Chinese dialects or minority languages remains

unclear. Some unclassified dialects are even on the verge of extinction. How to boost language vitality of these dialects to maintain linguistic diversity will be a challenge we must tackle earnestly in dialectology and in language ecology.

NOTES

1. *Bang* has a bilabial initial while *fei* has a labiodental initial. Only bilabial initials existed in Old Chinese, and labiodentals were split from bilabials in Middle Chinese. The nondistinction between *bang* and *fei* suggests that labiodentals have not yet differentiated from bilabials.
2. *Duan* has an alveolar initial, while *zhi* has a palatal initial. Only alveolar initials existed in Old Chinese, and palatals were split from alveolars in Middle Chinese. The nondistinction between *duan* and *zhi* suggests that palatals have not yet differentiated from alveolars.
3. *Cizhuo shangsheng* or "secondary voiced initials (sonorants) with the rising tone" refer to rising-toned words with nasal or lateral initials, such as *ma* 马, *mi* 米, *ling* 领. The phenomenon for the rising-toned secondary voiced initials to change to the dark even tone (*yinping*) signifies that all sonorant rising-toned words are now pronounced with the dark even tone instead of the rising tone.
4. Syllable division words are a way of forming new words. This is done by inserting -aʔ- between the initial and final of a syllable, thereby splitting a monosyllabic word into two. For example, in the Pingyao 平遥 dialect spoken in Shanxi, the syllable division word kaʔlaŋ 楷榔 is derived from inserting -aʔ- into kang 糠.
5. "Ge-group" is a rhyme group in Old Chinese phonology, the primary vowel being *-a-. The "ge-group words being read as -a" refers to the fact that ge-group words are still pronounced with the final vowel -a nowadays. For instance, words like *qi* 骑, *ji* 寄 and *yi* 义 from the ge-group are pronounced as *kha*, *ki*, and *hi* in Min, retaining the Old Chinese *-a-.
6. *i*ʔ is also used as a verb in Cantonese.
7. The numbers 1, 2, 3, and 4 indicate the four tones *yinping* 阴平 'dark even or level', *yangping* 阳平 'light even or rising', *shangsheng* 上声 'dipping tone' and *qusheng* 去声 'falling tone' in Pekingese.

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CHAPTER 12

MIN LANGUAGES

CHINFA LIEN

12.1 SOUND PATTERN

12.1.1 The Consonantal System

The initial system (viz., the consonants in the onset position of a syllable) of Min languages can be pneumatically captured by a set of fifteen representative characters, each bearing the initial in question, as shown in Table 12.1 featuring fourteen characters in addition to 英, the zero initial not shown here.¹

In this system, aspiration is phonemically contrastive in the voiceless stops and affricates series. However, if we focus on Southern Min, we can see that each nasal and its denasalized homorganic counterpart such as m/b, n/d, and ŋ/g are in complementary distinction and show no phonemic contrast.² All the reflexes of Middle Chinese (MC) obstruents have been devoiced. The present-day voiced obstruents are all from MC nasals and did not come from MC voiced obstruents as they had been devoiced.

Not all Min languages share the development of denasalization. It occurs in Southern Min and Puxian, and Central Min, but not Eastern Min, and Northern Min.³ Puxian takes a further step to devoice the secondary voiced stops and affricates, yielding /p/ < /*b/ < *m/, /t/ < /*d/ < /*n/, /k/ < /*g/ < /*ŋ/, and /ts/ < /*dz/ < /*nz/. There is only one affricate and fricative series in Min except Central Min, which boasts a two-way distinction of affricates and fricatives (viz., dentals vs. palato-alveolars).

12.1.2 The Vocalic System

Let's take Southern Min as a point of departure. As shown in Table 12.2, it has a seven-vowel system where mid vowels are not symmetric: one front versus two back mid vowels. The front mid vowel /e/ is derived from two sources: in /teʃ/ 蹄 'hoof' and /teʃ/ 茶 'tea' a distinction still kept in the Zhangzhou variety.⁴

Table 12.1 The Consonantal System of Southern Min

| Manner | Bilabial | Dental | Velar | Glottal |
|----------------------|----------------------|-------------------------|-------------------------|---------|
| Voiceless stop | p 边 p ^h 颚 | t 地 t ^h 他 | k 求 k ^h 去 | |
| Nasal | m 文 b 文 | n 柳 (d) 柳 | ŋ 语 ŋ 语 | |
| Voiced stop | | l 柳 | | |
| lateral | | ts 笋 ts ^h 出 | | |
| Voiceless affricates | | dz 入 | | |
| Voiced affricates | | s 时 | | h 喜 |
| Voiceless fricative | | | | |

Table 12.2 The Vocalic System of Southern Min

| | Front | Central | Back |
|------------|-------|---------|-------|
| High | i | | (u) u |
| Higher mid | e | | o |
| Lower mid | [e] | a | ɔ |
| Low | | a | |

Each of the front vowels is paired with its rounded counterpart /y/ and /ø/ in Eastern Min, Northern Min, Puxian and Central Min has additional front rounded vowels: /y/ and /ø/ paired with /i/ and /e/.⁵

12.1.3 The Tonal System

The Sinitic languages, including Min, have tone superimposed on syllables comprising consonants and vowels. Like other Sinitic languages Min has traditionally its roots in four tone categories. Let I, II, III, and IV stand for four tone categories (level, rising, departing, and entering tones) in MC.⁶ The division of each tone splits into two sub-tones in modern Min and is conditioned by the phonetic properties of initials. There was in MC a voicing difference between voiced and unvoiced obstruents, be they stops, fricatives, or affricates. Following the devoicing of voiced obstruents, secondarily derived unvoiced ones merged with the originally unvoiced ones. But the first group left its imprint on the pitch value of the syllable (viz., depressing it), following the loss of its voicedness. The phonetically noncontrastive pitch difference was phonologized as phonemically contrastive tonal difference. Thus the syllables with the voiceless obstruents derived from those featuring the MC voiced obstruents and the syllable with sonorants (viz., nasals and lateral) form a natural class and take on the subtone *b* in contrast to the syllables with the MC voiceless obstruents, which take on the subtone *a*.

Table 12.3 The Tone System of Southern Min

| | I | II | III | IV |
|---|--------------------------|--------------------------|--------------------------|----------------------|
| a | 55 (33) hong 風 hong | 51 (55) hong 坊 lang 籠 | 21 (51) hong 放 | 21 (4) hok 福 |
| b | 15 (11) hong 皇 lang 依 | hong 奉 lang 網 | 33 (21) hong 凰 lang 弄 | 4 (2) hok 服 lak 六 |

As shown in Table 12.3, each syllable in Southern Min has an allomorphic variation: isolation tone and combination tone. Isolation tone occurs in a syllable in the pre-pausal position or before an unstressed syllable.

Tone IIa is particular in that the MC Tone II syllables with the sonorant initials parted company with those with the MC Tone II voiced obstruent initials and joined the syllable with MC Tone II voiceless obstruent initials to form syllables taking on the subtype IIa, as in lang⁵¹ 籠 'basket'. By contrast, the MC tones II and III that the syllables with the MC voiced obstruents bear merge into a single tone (viz., IIb merges with IIIb). Thus, there is no tonal difference between hong³³ 奉 'to revere', an MC Tone II syllable with the initial *bj-, and hong³³ 鳳 'phoenix', an MC Tone III syllable with the initial *bj-, taking on Tone IIIb with the same tone value. The stratum distinction between colloquial and literary speech makes a difference in the tonal realization. For example, [kʰ] 'net' is realized as hong⁵¹, a Tone IIa literary form, and bang³³, a MC Tone II syllable taking on Tone IIIb colloquial form. So there is no distinction between bang³³ 'net', an MS Tone II syllable, and bang³³ 夢 'dream', an MC Tone III syllable, and combination tone given in parentheses occurs before a stressed syllable.

Southern Min, Eastern Min, Puxian, and Northern Min all feature the seven-tone system as a result of the merger of IIb into IIIb, yielding Tone 7. But the tone system in Northern Min experiences more tonal reduction: Tone 5 (Ib) and Tone 7 (IIb and IIIb) partially further merges into Tone 2 (IIa) and Tone 8 (VIIb), respectively, and Tone 6 merges into Tone 8. For Central Min there is only one tone category for both the departing and entering tone (Li 1996). What is unique in this dialect is that Tone 6 traceable to IIb has remained an independent tone category to which Tone 8 merges. Tone 3 covers IIIa and IIIb. Tone 4 claims only Iva, as IVb has joined Tone 2.

12.1.4 Syllable Structure

The syllable structure in Min is C₁ V (C₂). C₁ in the onset position can be filled by all the fourteen consonants or left empty. C₂ in the coda position is optional, but it can be realized as /m/, /n/, /ŋ/, /p/, /t/, /k/, and /ʔ/ in Southern Min. The nasal and stop endings have been coalesced into /ŋ/ and /ʔ/, respectively in Eastern Min and

Puxian. Northern Min kept the entering tones but shed the glottal stop. Even though Central Min coalesced /-m/, /-n/, and /-ŋ/ as /ŋ/ in a portion of words, it has taken on a newly rising /m/ that is not traceable to *-m/ in another set of words. Instead, /-m/ comes from MC /-n/ and /-ŋ/. Like Southern Min, Central Min witnessed the nasalization of its vowel following the loss of the nasal codas for a set of words. Nasalization of the nasal finals occurs in Southern Min, Puxian, and Central Min rather than Eastern Min and Northern Min. But some varieties of Puxian experience the loss of nasalized element resulting in the merger of MC light register finals (Yang, the syllables with nasal codas) and MC dark register finals (Yin, the syllables with non-codas), as in tia² 媊 'pot' and tia³ 爹 'dad'. The loss of nasalized elements may lead to the further devoicing of the secondarily derived voiced stops and affricates in Puxian.

12.2 GRAMMAR

12.2.1 Demonstratives

Demonstratives in Min show a two-way (proximal and distal) distinction represented by the *ts-* and *h-*, respectively. As shown in Table 12.4, the demonstratives do not as a rule stand alone. Each of them occurs with the forms expressing number, location, time, and degree. There is a tendency for the demonstrative to be fused with the following element.⁷

Table 12.4 The Demonstratives in Min

| Graph | SM | PX | EM | NM | CM | Gloss |
|----------|-------------------------------------|---|--|--|---|-----------------|
| Location | tsia ¹ | tse ^{ʔ8} ui ⁷ | tsu ⁵ uai ³ | ioŋ ⁴ ti ² | tʃio ⁴ | here |
| | hia ¹ | he ^{ʔ8} ui ⁷ | xu ² uai ³ | u ⁴ ti ² | u ³ | there |
| Singular | tsit ⁴ e ⁵ | tse ^{ʔ8} | tsi ² tsie ^{ʔ4} | ioŋ ⁴ tsia ⁴ | tʃio ⁴ tʃio ⁴ | this |
| | hit ⁴ e ⁵ | he ^{ʔ8} | x ² tsie ^{ʔ4} | u ⁴ tsia ⁴ | u ³ tʃio ⁴ | that |
| P plural | tsia ² e ⁵ | tsɔ ¹ e ¹ | tsi ² i ^{ʔ4} kian ² | ioŋ ⁴ tue ¹ | tʃio ⁴ sio ¹ | these |
| | hia ² e ⁵ | ho ¹ e ¹ | x ² i ^{ʔ4} kian ² | u ⁴ tue ¹ | u ³ sio ¹ | those |
| Time | tsit ⁴ tsun ⁷ | tse ^{ʔ8} ts ^h o ^{ʔ4} | tsi ² ouŋ ⁵ | ioŋ ⁴ si ² xe ⁷ | tʃio ⁴ ho ³ | this time |
| | hit ⁴ tsun ⁷ | he ^{ʔ8} ts ^h o ^{ʔ4} | x ² ouŋ ⁵ | u ⁴ si ² xe ⁷ | u ³ s ⁵ tse ⁴ | that time |
| Degree | tsia ² ni ¹ | 即 下 tse ^{ʔ8} ko ⁵ /tsɔ ⁵ | tsi ² man ² | ioŋ ⁴ | tʃio ⁴ ti ³ ti ³ | So ₁ |
| | hia ² ni ¹ | 毋 下 he ^{ʔ8} ko ⁵ /ho ⁵ | x ² man ² | u ⁴ | u ³ ti ³ ti ³ | So ₂ |

Note: SM = Southern Min, Xiamen; PX = Puxian, Putian; EM = Eastern Min, Fuzhou; NM = Northern Min, Jian'ou; CM = Central Min, Yong'an.

12.2.2 Pronouns

Pronouns show grammatical features of person and number but not gender and case. The first person is 我 in all Min dialects except Central Min, which has 俺 as an alternative form, whereas the second person is 汝 in Southern Min, Puxian, and Eastern Min and 你 in Northern Min and Central Min. The difference between 汝 and 你 lies mainly in the phonological shapes of the final (viz., rounded vs unrounded). The third person is 伊 in Southern Min, Puxian, and Eastern Min and 渠 in Northern Min and Central Min.⁸ The origin of the plural form is 侬 in all Min dialects except Central Min, which features 侪.⁹ The plural form 侬 alone has been reduced and become the coda of the pronominal root yielding 侬² (excl.) 阮/lan² (incl.) 咱 'we'; 侬² 恁 'you (pl.); and in¹ 因 'they' in Xia-Men,¹⁰ but it remains an independent syllable in Puxian, Eastern Min, and Northern Min preceded by another word like 各 or 伙. Unlike other Min dialects, Southern Min and Puxian share the distinction of exclusive and inclusive first-person plural.

The striking feature of pronouns in Min is that the third-person pronoun 伊 develops out of the old deictic terms such as 厥, 其, and 之 rather than 他 in Mandarin, which did not emerge until after late Old Chinese.

Table 12.5 Pronouns in Southern Min

| Graph | SM | PX | EM | NM | CM | Gloss |
|-----------|----------------------------------|----------------------------------|--------------------------------------|-------------------------------------|----------------------------------|-----------|
| 我俺 | guc ² | (k)uc ² | quci ² | ɲue ² | guɔ ¹ ō ¹ | I |
| - (各/伙) 侬 | guan ² | (k)uc ² | ɲuci ² kou ² 4 | ue ² | o ¹ tse ⁵ | We (excl) |
| - 侪 | | naŋ ⁵ | nøyŋ ⁵ | xuan ² nein ³ | | |
| 咱/侬/俺 | lan ² | na ² tak ⁸ | naŋ ⁵ kou ² 4 | aŋ ¹ xuan ² | ō ¹ tse ⁵ | We (incl) |
| 汝/你 | li ² /lu ² | ke ⁵ | nøyŋ ⁵ | nein ³ | | |
| - (各/伙) 侬 | lin ² | ly ² | ny ² | ni ² | gi ¹ | you |
| - 侪 | | ly ² naŋ ⁵ | ny ² kou ² 4 | ni ² | gi ¹ tse ⁵ | you |
| 伊渠 | i ¹ | ii | i ¹ | ky ¹ | gy ¹ | he/she |
| - (各/伙) 侬 | in ¹ | i ¹ naŋ ⁵ | i ¹ kou ² 4 | ky ¹ xuan ² | gy ¹ tse ⁵ | they |
| - 侪 | | | nøyŋ ⁵ | nein ³ | | |

12.2.3 Modals

Min dialects share the epistemic/dynamic modal roughly meaning 'can, may' 会 (<解), the boulomaic modal is realized as 卜/掣.

Table 12.6 The Modals in Min

| | | Deontic modal | Epistemic modal | Dynamic modal | Boulomaic | Imperative |
|----------|-------------|---|--|--|---|--|
| Positive | Possibility | thang ¹ 通 e ⁷ -sai ² -tit ⁴ 会使得 | e ⁷ 会 | e ⁷ -hiau ² -tit ⁴ 会晓得 | beh ⁴ 卜 | |
| | Necessity | tioh ⁸ 着 tioh ⁸ -ai ³ 着爱 ai ³ 爱 | tiann ⁷ -tioh ⁸ 定着 | gau ⁵ 着 e ⁷ -tit ⁴ 会得 | ai ³ -beh ² 爱卜 | |
| Negative | Possibility | m ⁷ -thang ¹ 毋通 be ⁷ -sai ² -tit ⁴ 袂使得 | be ⁷ 袂 | be ⁷ -hiau ² -tit ⁴ 袂晓得 | m ⁷ 毋 | boh ⁸ -tit ⁴ 莫得 |
| | Necessity | bien ² 免/m ⁷ -bien ² 怀免 | bo ⁵ -tiann ⁷ -tioh ⁸ 无定着 | be ⁷ -tit ⁴ 袂得 | bo ⁵ -beh ⁴ 无卜 bo ⁵ -ai ³ 无爱 | mai ³ m ⁷ -sai ² 毋使 |

Table 12.7 A More Elaborate System of Modals in Min

| Graph | SM | PX | EM | NM | CM | Gloss | |
|-------|--------------------|-------------------|---------------------|--|-------------------------------------|-------------------|--------|
| 会 | e ⁷ | e ⁷ | a ⁷ | ɕ ⁴ | e ⁶ | can | |
| 卜/討 | be ⁷ 4 | po ⁷ 4 | puɕ ⁷ 4 | nioŋ ⁷ | thau ² /iam ³ | want | |
| 着 | tio ² 8 | tiau ⁷ | tuok ⁸ , | ij ¹ ɣai ¹ louŋ ¹ | kai ¹ toŋ ¹ | ɲiam ³ | should |

Table 12.7 shows a more elaborate system of modals featuring deontic, epistemic, bouloamic modals as well as modals exclusively used in imperatives in Southern Min.

12.2.4 Negation

Min languages are quite robust in negative expressions and show a high degree of uniformity in etymological origin of negation. As shown in Table 12.8, the first negative word denoting 'not have' often written as a demotic character 无 (= 无) is a fusional word incorporating a negative element and the word 'have'. Its status as a fusional word is evidenced by being able to be followed immediately by a noun phrase, and bears on the notion of the negative aspect of possession and existence corresponding to *mei²(you²)* 没有 in Mandarin. The second negative word written as 休 or 毋 often possesses a concomitant sense of volitionality. The third negative word written as 袂, a phonetic loan character, is also a fusional word contracting a negative element and a modal 解 denoting possibility. It can be used as a negative epistemic or dynamic modal expressing 'not possible' or 'be unable to'. The fourth negative word is 未 or 未曾 'not yet' and as a negative counterpart of the experiential marker *bat⁴/pat⁴* 捌 in Southern Min corresponding to another sense of *mei²(you²)* 没有 'not yet' in Mandarin.¹¹ The fifth one 莫 is a negative meaning 'don't' used exclusively in

Table 12.8 The Negative elements in Min

| Graph | SM | PX | EM | NM | CM | Gloss |
|-----------|-----------------------------------|----------------------------------|-----------------------------------|------------------------------------|---------------------------------|------------|
| 无/毛 | bo ⁵ | po ⁵ | mo ⁵ | mau ² | bau ⁵ | not have |
| 休/毋 | m ⁷ | ŋ ⁷ | ŋ ⁷ /ŋ ⁷ | eiŋ ⁷ | aŋ ³ | not |
| 袂/勿 | be ⁷ | pe ⁷ | ma ⁷ | mai ⁸ | be ⁶ | cannot |
| 未/未曾 | be ⁷ | peŋ ⁵ | mai ⁷ | mi ⁷ nain ² | aŋ ³ ka ⁵ | not yet |
| 莫 | mai ⁷ | | mo ² 8 | mo ³ | aŋ ³ ta ⁴ | don't |
| 休/通/敢 | m ⁷ -thaj ¹ | ŋ ⁷ nain ¹ | iq ⁷ nøyŋ ² | eiŋ ⁷ kaŋ ² | aŋ ³ ta ⁴ | should not |
| 免/休/使/注/得 | bien ² | n ⁷ nai ² | n ⁷ nai ² | eiŋ ⁷ niaŋ ⁷ | aŋ ³ ta ⁴ | need not |

Note: SM = Southern Min, Xiamen; PX = Puxian, Putian; EM = Eastern Min, Fuzhou; NM = Northern Min, Jian'ou; CM = Central Min, Yong'an

Table 12.9 Imperative-specific Negatives in Min

| Min | SM | EM | PT | NM | CM | Mandarin |
|---------|---|--|-----------------------------------|---|---------------------------------|--------------------|
| 不通/让, 莫 | m ⁷ thaj ¹ , baŋ ¹ | ŋ ⁷ <iq ⁷ -nøyŋ ⁷ , mɕ ² 8 | ŋ ⁷ -nain ¹ | eiŋ ⁷ -niaŋ ⁷ , mo ³ | aŋ ³ ta ⁴ | bei ² 别 |

Note: SM = Southern Min, Xiamen; PX = Puxian, Putian; EM = Eastern Min, Fuzhou; NM = Northern Min, Jian'ou; CM = Central Min, Yong'an

Table 12.10 Verb-complements with Inlaid Modals in Southern Min

| Positive | Negative |
|--|--|
| V-会-C sia ² -e ⁷ -ho ² 写会好 'Can finish writing' | V-袂-C sia ² -be ⁷ -ho ² 写袂好 'Cannot finish writing' |

imperatives. The sixth one is a negative compound word consisting of the negative 休 + the deontic modal of necessity 通 meaning 'should not' that can be used in indicative or imperative mood.¹² The seventh word is a compound often contracting the negative 休 + the deontic modal of necessity 使 meaning 'need not'.¹³ It can be 免 as arguably a suppletive form of the positive deontic modal of necessity *toh⁸* 着 especially in Southern Min.

Negative fusional words like *don't* in English are not limited to imperatives. In contrast, the imperative-specific negative words in Min are shown in Table 12.9.

Modals can not only occur preverbally but also as infix-like elements in verb-complement constructions in Min, as shown in Table 12.10. Here in Southern Min the infix *e⁷会* (<解) and its negative counterpart *be⁷袂* (休 + 解) are inherent dynamic modals.

12.2.5 Grammatical Markers

Some grammatical function words are derived from lexemes via grammaticalization. 乞 and 将 are two cases in point. 乞 functions as an agent marker in passives in Southern Min (Quanzhou variety), Eastern Min, and Puxian.¹⁴ Its origin as 乞 a ditransitive verb of giving can be seen in Southern Min (Chaoshou variety), Eastern Min, and Puxian.¹⁵ Likewise, *na⁴* 哪 functions as a verb of giving as well as the agent marker in passives in Northern Min. Like 把 as a patient marker in Mandarin, 将 originated as a verb of holding grammaticalized as a patient marker in the dispositional construction shared by Southern Min, Eastern Min, and Puxian, especially in the literary stratum. Northern Min chose another verb of holding *na⁸* 拿 and developed it into a patient marker. Eastern Min exhibits the multiple functions of 共 as a source, benefactive marker, coordinate conjunction, and comitative marker.

Table 12.11 Grammatical Markers in Min

| Min | SM | EM | PX | NM | CM | Words | Mandarin |
|------------------------|------------------------------------|--------------------|-------------------|------------------|--------------------------------------|-----------|----------|
| 'give' | ho ⁷ | khøy ²⁴ | khə ²⁴ | na ⁴ | khieŋ ³ /khe ³ | 乞予响遣 | 给 |
| Agent marker | khit ⁴ /ho ⁷ | khøy ²⁴ | khə ²⁴ | na ⁴ | khieŋ ³ /khe ³ | 乞予响遣 | 给 |
| Patient marker | tsiŋ ¹ | tsuŋ ¹ | tsəŋ ¹ | na ⁸ | tsiam ¹ , nō ¹ | 将拿 | 把 |
| Source marker | ka ⁷ , kan ⁷ | kəyŋ ⁷ | ka ²⁴ | iau ¹ | tsau ³ | 共合邀做 | 和向 |
| Benefactive marker | ka ⁷ , kan ⁷ | kəyŋ ⁷ | khə ²⁴ | pcŋ ¹ | thi ³ | 共合帮替 | 替 |
| Coordinate conjunction | kap ⁴ /ka ²⁴ | kəyŋ ⁷ | ko ²⁴ | iau ¹ | tsau ³ | 做 共合邀做 | 和跟 |
| Comitative marker | kap ⁴ /ka ²⁴ | kəyŋ ⁷ | ko ²⁴ | iau ¹ | tsau ³ | 做 共合邀做 | 和跟 |

Note: SM = Southern Min, Xiamen; PX = Puxian, Putian; EM = Eastern Min, Fuzhou; NM = Northern Min, Jian'ou; CM = Central Min, Yong'an.

an old grammatical feature attested in the earlier Southern Min playscripts. The function of coordinate conjunction and comitative marker used to be claimed by 共 is taken over by 合 in Southern Min and Puxian but ko²⁴ 合 extends its domain to the benefactive and source marker in Puxian. Northern Min and Central Min embrace different function words as source and comitative marker and coordinate conjunction and may implant the benefactive markers from Mandarin. See Table 12.11.

12.3 TEXTUAL MATERIALS

Compared with other Southern dialects like Yue, Kejia, and Gan, Min is blessed with a body of written records dating back to the 16th century at the earliest. The written sources include local time books, popular playscripts, and religious texts compiled by Western missionaries.

There were extant Southern Min playscripts from the mid-16th century onward showing a mixture of Quanzhou and Chaozhou dialects. The most noteworthy are a series of *Li Jing/Zhi Ji* 荔枝/技记 'The Legend of the Romance of the Litchi Mirror' as well as some other similar types of playscripts (Wu 2001).

Further, there appeared in the early part of the 16th century the Romanized texts accompanied by Chinese characters compiled by Spanish missionaries in the Philippines that record the colloquial speech of Southern Min, in particular Zhangzhou and perhaps Chaozhou dialect. Two texts worth attention are *Arte de la Lengua Chio-chiu* (AD 1620), a manual for learning Southern Min for Spanish missionaries (Klötter 2010) and *Doctrina Christiana* (no later than AD 1607), a wood-block Chinese text with some demotic characters representing the Southern Min dialect. (Loon 1966, 1967; see Yue 1999 and Chappell 2000 for studies of grammatical changes based on the texts of such type.)

12.4 THEORETICAL ISSUES

There has been a steady growth of descriptive works on Min languages that considerably deepen our understanding of various aspects of these languages, but the intriguing debates on some pivotal issues continues unabated. The debates bear on issues such as whether "aberrant" tonal developments are a result of contact-induced tonal strata or a reflection of Min-specific tonal change (see Norman 1974, 2000; Hirata 1988; Wang 1994; Handel 2009), or whether the Shaowu 邵武 language is a Min or a Kejia language (see Pan et al. 1963; Norman 1982; Chang 1984; Zhang and Wan 1996). The claim concerning the shared innovation of Min and Wu languages (see Ting and Zhang 2002), and the issue of chronological strata have perennially engaged the interest of linguists (Norman 1979; Yang 1982; Ting 2007) and sparked lively debates. Min languages are noted for richness in the fine distinction of chronological strata. There has been an undivided interest in the studies of stratal distinction (see, e.g., Sung 1973; Norman 1979; Ho 2000; Ting 2007). There is also a growing concern with the contact-induced change regarding the substratum influence on Min languages by non-Sinitic languages like Tai-Kadai or Austroasiatic languages. Mei and Norman (1976) propose that *kiam⁷/kann⁷* [ɛ] was borrowed from the Austroasiatic language, which has developed into a very productive diminutive suffix in Min. The implosive initials found in Hainan dialects shows the effect of Tai-Kadai influence (cf. Nishida 2000; Diller et al. 2008). Two-way distinction of nasals (viz., the contrast between voiced nasals and voiceless nasals) has been found in Southern Min, an areal feature shared by some non-Sinitic languages in South China. (Norman 1991).

NOTES

1. For the information on sound systems of Min dialects I rely on BDZYWWJ (2003) and FSDBW (1998).
2. MC nasals /²m/, /²n/, /²ŋ/ and /²nz/ are denasalized as [b], [d], [g], and [dz], respectively, except when the final is nasalized or a syllabic nasal. Thus we have each pair of the denasalized series and nondenasalized series such as [b] and [m], [d] and [n], [g] and [ŋ], [dz] and [n]. More exactly, *n* and *l* form a pair of allophones, since **ɹ*d has been merged into *l*.
3. Different versions of Central Min show a discrepancy in the denasalization of MC nasal initials. Denasalization is reflected in the variants of Central Min recorded in Zhou and Lin (1992) and FSDBW (1998) but not in Nakajima (1979) and Norman (1980).
4. /w/, as in /tuw/ 'pig' and /ə/, as in /hə/ 'fire', uniquely found in Quanzhou correspond to /i/ and /e/ in Xiamen, respectively. See Douglas (1873:529, 122).
5. Central Min has innovated the apical vowel /i/ that occurs after the dental affricates and fricative *tsh*-, *ts*-, and *s*- and corresponds to /i/ in Southern Min, Eastern Min, Northern Min, and Puxian.
6. The tone notation is based both on the 5-point pitch scale (1 lowest, 5 highest) and a description, for example, "[53] high falling", "[2] mid-low short level". In terms of

traditional category I, II, III, and IV stand for level, rising, departing, and entering tone, respectively, and each tone falls into *a* and *b* meaning *yin* and *yang*, respectively. The numerals 1, 2, 3, 4, 5, 6, 7, and 8 stand for Ia, IIa, IIIa, IVa, Ib, IIb, IIIb, and IVb. The combination tone of Ib is realized as 33 in the Zhangzhou variety of Southern Min. For the correlation of subtonal development and the phonetic properties of initials see Wang and Lien (1993).

7. Information on syntactic and semantic aspects of Min dialects is adduced from BDZYWWJ (1995) and FSDBW (1998).
8. Northern Min and Central Min show an affinity with Kejia, Gan, and Yue.
9. The plural ending of the pronouns in Central Min is tse⁶ 仔, an ending also found in some varieties of Kejia, Yue, and Gan.
10. There is a regional variation in Southern Min. Chaozhou, for example, shows that first- and second-person plural are realized as fusional forms, as in un² (excl.)/nan² (incl.), and nin², but third-person plurals take on the form /i¹ nan²/仔 依 or simply the fusional form /inj¹/. Apart from nan² 依 as a plural marker, there are other variants such as mu⁶ (<pu⁶ 乖) and lo⁶ (<tsou⁶ 牌) in some varieties of Puxian (Cai 2006).
11. 未曾 is a coordinate compound consisting of two experiential markers, as in mi²-nai² (<mi²-tsai²) in Jianou. 你曾 依-你² is another alternative form in this dialect. *pej⁵* in Puxian is probably a contracted form of 未曾 *pi²-ne²*.
12. *ŋ² nai¹* 不通 in Putian is derived from *ŋ² thi¹* by progressive assimilation, as is *ij¹ nəŋ¹* in Fuzhou.
13. *ŋ² nai²* 你使 'need not' in Putian comes from *ŋ² tai²* by progressive assimilation. This is true of *ŋ² nai²* in Fuzhou. Jianou features *eiŋ² niŋ²* 你让.
14. Although Xia-min shows *h²* rather than *kh¹* as a ditransitive verb as well as the agent marker in passives, *kh¹* 乞 bearing both functions is still prevalent in the pan-Southern Min area (Chappell 2000).
15. *khay³* 勒 in Puxian is construed as a fusion of *kh¹* 乞 and *na⁵* 依. Likewise, *khie³* 遣 in Central Min may be taken as a result of the same type of fusion.

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CHAPTER 13

THE YUE LANGUAGE

ANNE O. YUE

13.1 BACKGROUND

ONE of the references for the word *Yue* serves as a cover term for various ethnic groups called the Bai Yue or Hundred Yues, who inhabited the vast region from the present-day estuary of the Yangtze River across southeastern through southern coastal China during the Warring States (475–221 BCE), Qin (221–207 BCE), Han (206 BCE–220 CE), and the Three Kingdoms (220–265) periods.¹ The different Yue ethnic groups that appear in written records include the Nan Yue or Southern Yue, whose habitat spanned present-day central Guangdong province. There was even a Nan Yue kingdom established during the Qin-Han periods.²

Although little is known of the languages of these ancient ethnic groups, there is an important document, the *Song of a Yue Man*, cited in the Shan Shuo 善说 chapter of *Shuo Yuan* 说苑 by Liu Xiang 刘向 of late Western Han, consisting of five verses translated with Chinese characters and translated into Chinese. It was not until 1991 that it was satisfactorily deciphered by Zhengzhang Shangfang using Written Thai and his own reconstruction of Old Chinese. The song is the oldest verifiable extant written record of at least one ethnic group among the peoples of the Hundred Yues, who constitute without doubt the ancestors of the Tai people today.³

On the other hand, there is no historical record of the types of languages and dialects brought into the Nan Yue region along with military conquests from 217 to 214 BCE and with the emigration of military personnel, escapees, garrison soldiers, merchants, and so on. During Qin-Han times, immigrants from the Central Plains (especially central and lower basins of the Yellow River) concentrated around the present-day Pearl River Delta as well as valleys of the East River, North River, and Gui River. Although they constituted the ruling class, being in the great minority, they could not but follow the customs of the Yue aborigines (Ge 1997, 1:181–182; 11:43, 72–73). Furthermore, due to geographical obstacles, subsequent settlement of immigrants was scarce with merely some banished officials.⁴ It was not until the late Tang Dynasty that a significant number

came as refugees from the war torn Central Plains. "The fact that even nowadays the Yue speakers, especially Yue immigrants in foreign countries, call themselves Tang people, call their country Tang-shan ('mountain'), their language the Tang language, and their clothes the Tang costumes, suggests that the local people became anxious to be identified with the Central Plains people during the Tang dynasty" (Yue 1972a:3).

13.2 GEOGRAPHICAL DISTRIBUTION

The modern Yue language is spoken in central and western Guangdong as well as eastern Guangxi, concentrating especially in the Pearl River Delta region and along the West River and the North River valleys. Cantonese, the standard dialect, has been the lingua franca of both Guangdong and Guangxi before the spread of Standard Mandarin after the mid-20th century. The term "Cantonese," originally used to designate the language of Guangdong by foreigners, has also been used as a cover term for the Yue language as well as for any of its dialects. Linguistically speaking, "Cantonese" designates the dialect spoken in the city of Guangzhou or Canton while "Yue" refers to a Han language composed of many varieties with Cantonese as their prestige dialect. There are also a sizeable number of Yue speakers in Southeast Asia and North America.⁵

13.3 LINGUISTIC STRUCTURE

The modern Yue language consists of an interesting combination of Han and non-Han elements. As in the case of the majority of human languages, it is composed of several strata. The two major ones are Han and Tai. The Han stratum can be defined by features shared with other Han languages, within which a Mandarin or Northern and a Southern stratum can be observed. The Southern stratum contains features shared by Han languages such as Min, Wu, and Kejia or Hakka, spoken largely south of the Yangtze River. There may be more than one non-Han strata, but due to insufficient information, only the Tai stratum can be relatively systematically determined. Subgroups of Tai strata—the Central and the Northern, as well as the Southwestern per F.-K. Li (1977:xii)—can also be observed.

The following prominent linguistic characteristics of Yue are arrived at by observing approximately 100 dialects and subdialects sharing similar features not found in other Han languages and by comparison with non-Han languages.

13.3.1 Phonological Features

Three unique phonological features of Yue define it as a major language distinct from other Han languages. Across Han and Tai languages, there is a correlation between tonal

categories and the aspiration of initial consonants that largely differentiate them from one another. Four major tonal categories have been established for these languages: Ping or Level, Shang or Rising, Qu or Departing, and Ru or Entering for Han, and A, B, C, and D for Tai per Li (1977:28). The majority of the Yue dialects are distinguished by the occurrence of aspirated voiceless initial consonants (derived from voiced consonants) in syllables with the Ping and the Shang Tone and unaspirated ones (derived from voiced consonants) with the Qu and the Ru Tone in the colloquial language.⁶ For example, the following are all pronounced with aspirated surds and the Shang Tone in Cantonese:⁷

(1a) *khu*²⁴ 'maternal uncle', *phɛi*²⁴ 'covering', *tshɿ*²⁴ 'to sit'

but with unaspirated surds and the Qu tone in Standard Mandarin:

(1b) *tshu*⁵³, *pei*⁵³, *tsu*⁵³

However, the correlation of tones and aspiration occurs in different scenario in different Yue dialects, which can be traced to the subgroups of Tai strata. Namely, Guangxi dialects such as Tengxian 藤县, have unaspirated initial consonants (derived from voiced ones) appearing in syllables with any tone, similar to Central Tai and Northern Tai, while those like Bobai 博白 have aspirated initial consonants (derived from voiced ones) appear in such syllables, similar to Southwestern Tai.⁸ The former type occurs in the colloquial stratum of some Yue dialects spoken in the Pearl River Delta (e.g., Shunde 顺德, Gaoyao 高要, Gaoming 高明) too.

The other two defining features come from the Tai stratum. One is a correlation between vowels and tones in the Ru category, rendering this category to split into four subcategories. More specifically, tense vowels occur with tones lower in pitch while lax vowels occur with those higher in pitch historically (Li 1977:28–29).⁹

(2) *sɿp*⁵ 'wet'; *sa:p*⁴⁴ 'to blink'; *sɿp*³ 'ten'; *sa:p*³³ 'to simmer'

(Yulin 郁林) *sɿp*⁵⁵ 'wet'; *ɬɔp*⁴⁴ 'to blink'; *sɿp*²² 'ten'; *sɔp*¹¹ 'to simmer'

This very feature that distinguishes Yue from other Han languages, however, is found among Tai languages too (Li 1977:28–29).

The correspondence of a glottal fricative [h] in the colloquial language of the majority of the Yue dialects to a voiceless aspirated velar plosive [kh] in a minority of them can be reconstructed as a change from the latter into the former type of sound. Such correspondence can be observed from the following two dialects, for example:¹⁰

(3) 'shell' — (Taishan Dancun 台山淡村) *hɔk*²¹;

(Zhongshan Shiqi 中山石岐) *khɔ:k*²

as well as among the Tai languages (Li 1977:193–196; Yue 2006:123–124).

Some phonological features typical of Yue are shared with other Southern Han languages: for example, the great majority of Yue dialects as well as the Wu language have a

system of eight tones with four pairs—Ping, Shang, Qu, and Ru—and, within each pair, one is higher (Yin) and the other lower in pitch (Yang):

- (4) *jeu*⁵³ 'to worry', *jeu*²¹ 'oil'; *jeu*³⁵ 'pomeio', *jeu*²⁴ 'to have'; *jeu*⁴⁴ 'slender',
*jeu*³³ 'right'; *sep*⁵ 'wet'; *sa:p*⁴ 'to blink'; *sep*³ 'ten'

Syllables ending with a bilabial nasal [m] or a plosive consonant are typical of Yue and Kejia, for example:

- (5) (Taishan) *khiam*²² 'pincers'; *kip*⁵ 'hurried'; *kit*⁵ 'small tangerine';
*khia:k*²¹ 'wooden clogs'

Doublets indicating colloquial versus literary reading occur in Yue, Hakka, and Min, for example:

- (6) (Zhongshan) 'cold'—*la:nj*²⁴ (colloquial); *lanj*²⁴ (literary)

Comparison across Yue dialects suggests the existence of consonant clusters, for example, *kl-, *khl-, *gl-, *yl-, *tl-, *dl-, *sl-, in proto-Yue (Yue 1972b), recalling the same in Old Chinese. For example:¹¹

| | | |
|------|-----------|--|
| *kl- | 鱗 crack | la ⁵ , Gaozhou 高州 ke ⁶ |
| *gl- | 儉 thrifty | kim ⁶ , Taishan liem ³ 'stringy' |
| *sl- | 抵 lick | la:i ³ , Taishan sai ⁴ |

13.3.2 Morphological Features

Aspectual marking for the perfective (PERF), the durative (DUR), or the tentative (TEN) may be indicated by tonal features. Such tonal modification is usually manifested in a high rising tone in syllables carrying a non-high tone. For example, PERF may be indicated by a high rising tone (e.g., Zhongshan Xiaolan 小榄), DUR by a high rising tone plus a locative (LOC) marking (e.g., Cantonese), and TEN by reduplication with the second syllable in a diminutive form (e.g., Rongxian 容县).¹²

- (7) (Zhongshan Xiaolan) *tsan*^{22>25} *ji*²² *sep*² *men*⁵⁵ (Zheng 1990:97)
earn+PERF twenty dollars

'earned \$20'

- (8) *khøy*²⁴ *khøj*^{24>35} *ŋy*⁴⁴ *slk*² *fa:n*²²

s/he stand+LOC+place(=DUR)¹³ eat rice

's/he eats standing'

- (9) (Rongxian) $\theta\theta^{13}\theta\theta^{35}$, $\text{fa}^3\text{tan}^{35}$ (Zhou 1987:62)
sit sit+TEN rub rub+TEN
'sit a little while' 'rub a little'

Intensive (INT) degree for stative verbs may be indicated by reduplication plus tonal modification: for example, intensive degree in Kaiping is indicated by reduplication and tonal modification on the first syllable:

- (10) (Kaiping) $\text{f}^{\text{H}}\text{f}^{\text{H}}$ *fa*³⁵ *fa*³³
fast+INT fast
'very fast'

While diminutive (DIM) degree is marked by reduplication and tonal modification on the second syllable with (e.g., Rongxian) or without (e.g., Bobai) a suffix:

- (11a) (Bobai) *k'iep*³² -*k'iem*¹² (Wang 1932:73)¹⁴
narrow-narrow+DIM
'a little narrow'
- (11b) (Rongxian) *pek*¹ *peŋ*³⁵ -*sin*⁵⁵ (Zhou 1987:63)
white white+DIM suffix
'a little white'

Just as in other Han languages, diminutives designating smallness, endearment, familiarity, and colloquialism for nouns are formed by suffixing, tonal modification, both suffixing and tonal modification, or tonal + segmental modification, all originated from a suffix with a chain of derivation. The underlying form of the suffix is -NVT, a full syllable composed of a nasal consonant plus a vowel and a certain tone. The diminutive form of a word consists of the root morpheme plus this diminutive suffix -NVT (e.g., Tengxian). The next stage of development sees the dropping of the vowel in -NVT, leaving -N with a certain tone T (e.g., Xinyi 信宜). The last stage sees the dropping of the -N and preservation of only the T (e.g., Taishan). If the root morpheme ends with a plosive, the -N may replace it with a homorganic nasal (e.g., Rongxian).

- (13) (Tengxian) *kei*⁴⁴ 'chicken' + *ni*⁵⁵ = 'chick'
- (14) (Xinyi) $\eta\text{ɔ}^{11}$ 'goose' : $\eta\text{ɔn}^{35}$ = goose + NT = 'gosling'
(Ye and Tang 1982:48)
- (15) (Taishan) *sa*³³ -*ŋui*²² 'shark' : *ham*²² -*ŋui*²¹ = salty-fish + T = 'salted fish'
- (16) (Rongxian) *kuk*³ 'grain' : *kun*¹⁵ = grain + NT = 'grain yet to ripen'
Zhou 1987:61)

Certain Yue word formation features are typical of Southern Han languages: for example, the head + modifier word order observed in the suffixing of gender markers for animals or in the compounding of certain words, which in turn bears similarity to the Tai languages:

- (17) 'hen' = chicken+female: (Shunde, Huazhou 化州) *kɿ⁵⁵-na³⁵*,
(Bobai) *kae⁵⁵>31-m⁴⁵*
- (18a) 'dried X' = X+dry: (Dongguan 东莞) *tɿ⁵⁵u³²kun²¹³* 'dried vegetable'
(Chen 1993:158)
- (18b) 'burnt rice' = rice+burnt: *fə:n³⁵tɿ⁵⁵*, (Lianzhou 廉州)
fə:n¹¹nəŋ⁵⁵, (Nanhai 南海) *fə:n²²həəŋ⁵⁵*
- (18c) 'raw fish' = fish+raw: *jy²¹sə:ŋ⁵³*
- (19) 'guest' = person+guest: (Yangchun 阳春) *j'əŋ⁴²hək²¹*

13.3.3 Syntactic Features

13.3.3.1 Aspects and Aspectual Complements

A special syntactic feature of Yue is marked by an extremely rich aspectual system. Apart from aspectual distinctions common to Han languages such as the perfective, imperfective, progressive, durative, experiential, tentative, inchoative, and continuative, there is an aspect marker that Yue shares with other Southern Han languages and that is the use of the existential verb in its positive or negative form before the verb to express the affirmative aspect: (< = derived from, NEG = negative, FP = final particle, CL = classifier; sg = singular number, pro = pronoun, pers = person)

Affirmative (AFF) < 'to exist, to have' 有:

i. Affirming the Past

- 19a. (Taishan) *no¹⁴⁴ jiu⁴⁴* *ŋ⁵⁵ theiŋ^{22>35} khui⁴⁴*, *mŋ⁴⁴*
1st sg pro have give money 3rd pers sg, not-have
ŋ⁵⁵ ni¹⁴⁴ *kɿ⁴⁴ phəŋ²² jiu²¹*
give 2nd sg pro CL friend

I gave him money; did not give any to your friend'

ii. Affirming the Present

- 19b. *nei²⁴ u^{k⁵}khɿ³⁵ yəu²⁴ mou²⁴ tsuŋ⁴⁴ tshɿ⁴⁴ a⁴⁴*
2nd sg pro home have not-have grow vegetables FP
'do you grow vegetables?'
- 19c. *j'i²⁴ tshin²² mou²⁴ tsuŋ⁴⁴ j'i²² ka⁵⁵ yəu²⁴ tsuŋ⁴⁴*
before not-have grow, now have grow
'(we) did not grow before; (we) grow now'

In addition, Yue possesses aspects and aspectual complements not found in other Han languages. Among them are the following types, all derived from verbs:¹⁶ (EMP = emphatic)

Denominative (DEN) < 'to deduct' 減

- (20) (Taishan) *na⁵⁵ han²² nie²¹ mŋ³³ ŋ⁵⁵ tɿ³³ khui³³*,
the thing not-have give all 3rd sg pro,
'didn't give him/her all of the stuff,
ŋ⁵⁵-kəm⁵⁵ nai⁵⁵ t'iek³
give-DEN some only
just some of it'

Turning-around-situation (TAS) < 'to turn' 返¹⁷

- (21) *j'i¹¹ ka⁵³ yəu²⁴ tshin³⁵ la³³, ma:i²⁴-fə:n⁵³ kin³³ sən⁵⁵ sə:m⁵⁵ tsoe:k⁴ ha²⁴ la⁵⁵*
now have money FP buy -TAS CL new clothes wear -TEN FP
'(you are) rich now, why not buy some new clothes to wear?'

Instantive (INS) < 'to contact' 亲

- (22) *lei²¹ -tshən⁵³ tsu^{n³} na:^{n³³} jən²¹*
come-INS then scold people
'(X) scold people as soon as (X) come'

Routine (RTE) < 'to open' 开

- (23) (Taishan) *tɿ³³ -hoi³³ khɿ²¹ fun³² t'iek⁵ ki⁵⁵ hɿ⁵⁵, m²²*
work-all-along this CL job quite good, NEG
'been working at this job all along and it is quite good, do not
t'ieŋ⁵⁵ kai⁵⁵ hɿŋ²²
want change occupation
want to change job'

Appending (APP) < 'to open' 开

- (24) *həy⁴⁴ -hoi⁵³ sən³³ pin³⁵ tha:m⁴⁴-ma:i²¹ kɿ⁴⁴ tsej³⁵*
go -APP follow convenience visit -also CL son
'along with going (there) take the convenience of visiting the son'

Redo (RED) < 'to pass' 过

- (25a) mi⁵⁵ ko⁴⁴ lan³³-tsɔ³⁵, pei³⁵-kwɔ⁴⁴ jɛt⁵ ko⁴⁴ ŋɔ²⁴ la⁵⁵
 this CL break-PERF, give-RED one CL 1st sg pro FP
 'this one has broken, give me another'

- (25b) ko³⁵ kin³³ si³³ nei²⁴ ji:u⁴⁴ nam³⁵-kuɔ⁴⁴ tsɛ⁴⁴ hou³⁵
 that CL matter 2nd sg pro need think-RED then fine
 'for that matter you must think it over'

Temporary (TEM) < 'to abide' 住

- (26) (Nanhai) ŋai²⁴ pei⁵³-tsy²² sam⁵⁵ kai⁴⁴ ŋan⁴⁴ thin⁴⁴
 1st sg pro give-TEM three CL silver money
 nei²⁴ sin⁵⁵
 2nd sg pro first
 'I give you three dollars for the time being first'

In addition, there are the following types of aspectual complements:¹⁸
 Resumative (RES) < 'to turn back' 返¹⁹

- (27) (Taishan) theiŋ³³ khi²² m²²hɔ⁵⁵ ʔa⁵⁵-lan³² va³², khoi²¹ ʃɿ³⁵
 thousand pray don't hit-break FP, this time
 'by all means don't break (this bowl), (one)
 m²² mai³²ak³ fan³³ khoi²¹ hɔ⁵⁵ ka vɔn⁵⁵ va³²
 NEG buy can RES such good CL bowl FP
 cannot replace such a good bowl nowadays'

Entirely (ENT) < 'to expose' 晒

- (28) (Taishan) khoi²¹ ʔai³² hie^u ʔui³⁵, koɿ³³ kouŋ⁵⁵ hie^kak⁴ ʔai³³ ma³³?
 such big CL fish, CL person eat can entirely FP?
 'such a big fish, can one person eat it all up?'

Finish (FIN) < 'to close' 埤

- (29) (Kaiping) ni³³ louŋ⁵⁵ tu³³ moɿ²² khui³³ mɔ³² hɔ⁵⁵ lo⁵⁵
 2nd sg pro all do FIN 3rd sg pro not-be good FP
 'wouldn't it be good that you do it all!'

Consequential (CSQ) < 'to contact' 亲

- (30) tsɔe:k⁴ kem⁴⁴ si:u³⁵ sa:m⁵⁵, jɛt⁵ tseŋ³³ tuŋ⁴⁴ tshɛn⁵³ pɔ!
 wear so few clothes, a while chill CSQ FPI
 'wear so few clothes, will catch cold later!'
 m²²pha⁴⁴, m²² tuŋ⁴⁴ tɛk-tshɛn⁵³
 NEG fear, NEG chill can CSQ
 No fear, will not catch cold!

13.3.3.2 Word Order

The word order of the negative potential in a Directional Complement, where NEG precedes the verb but the potential marker occurs between the verb and its complement, is typical of Yue:

- (31) (Taishan) ko³³ ak³ tai³², m²² na²² ak³ ʃian³³
 high too, NEG climb can ascend
 'too high up, cannot climb up'

Some word order features are common among Southern Han languages. For example, the two terms of comparison flanking the verb of comparison:

- (32) (Nanhai) ŋai²⁴ kau⁵⁵ kua⁴⁴ ɲy²⁴ loeŋ²⁴ thyŋ⁴⁴
 1st sg pro tall surpass 3rd sg pro two inch
 'I am two inches taller than him/her'

the different placement of the direct object and the indirect object dependent on the feature of the verb, with the direct object preceding the indirect object if the verb has the [+give] feature but inversely if the verb carries the [+deprive] feature:

- (33a) (Lianzhou) ŋɔ⁴ heɿ⁴⁴ ʔam⁵⁵ mɛn⁵⁵ ni²⁴ ʔim⁵⁵ lo⁵⁵
 1st sg pro give three dollar 2nd sg pro first FP
 'I give you three dollars first'

- (33b) (Lianzhou) ku⁴⁴ tse⁴⁴ -ɔ³ ŋɔ³⁴ sɛp² mɛn⁵⁵ ŋan⁴⁴
 3rd sg pro borrow PERF 1st sg pro ten dollar-silver
 's/he borrowed ten dollars from me'

and the placement of certain adverbs after the verb, also typical of Tai languages:

(34a) sek³ti⁵⁵ thim⁵⁵la⁵⁵
eat some add FP 'eat some more!'

(34b) (Nanhai) lei⁵⁵kan⁵⁵fœŋ³³tai²²kan⁵⁵tək⁵tseŋ²²
this CL room big-CL too
'this room is too big'

(34c) (Tengxian) ʔden³³ŋo²⁴ thɛi³⁵thɛi³⁵ʔin⁵⁵
wait 1st sg pro look-look first
'let me have a look first'

13.3.3.3 Others

The use of a bare classifier plus noun to indicate definite reference is similar to Tai languages:

(35) (Taishan) tʃiek³kai³³ ʃien³²-a³³ ɿ⁵⁵
CL chicken die PERF FP
'the chicken is dead'

The use of a pronoun for the inanimate in the object position, also common in Wu, is reminiscent of Old Chinese:

(36) (Kaiping) ni³³ touŋ⁵tu³³-mɔi²²khui³³ ma³² ho⁵⁵ ɿ⁵⁵
2nd pro all do-ADD 3rd sg pro not-be good FP
'wouldn't it be good that you do it all!'

Other Southern features include the obligatory presence of an agent in the marked Passive Construction:

(37) khoeŋ²⁴ pei³⁵jan²¹ tshœ:ŋ³⁵-tsɔ³⁵kɔ⁴⁴ŋɛn¹¹pa:u⁵⁵
3rd sg pro give person rob PERF CL purse
's/he was robbed of his/her purse by someone'

the placement of the negative potential in a Resultative Complement with an object where the negative marker either precedes the verb when the potential marker occurs between the verb and its object, or occurs between the object and the complement when the potential marker is absent:

(38a) m¹¹ ta³⁵tək⁵sei³³tse:k⁴⁴wu⁵⁵ʃɿŋ⁵⁵
NEG hit can die CL fly
'cannot kill the fly'

(38b) ta³⁵khœŋ²⁴ m¹¹sei³⁵
hit 3rd sg pro NEG die
'cannot kill him/her/it'

the distinction between a Manner Complement versus an Extent Complement (MKR = marker):

(39a) khoeŋ²⁴ sik³tək⁵hou³⁵fa:ɿ⁴⁴
3rd sg pro eat MKR very fast
's/he eats very fast'

(39b) khoeŋ²⁴ sik³dou⁴⁴thou²⁴ thou⁴⁴
3rd sg pro eat MKR stomach ache
's/he eats to such an extent that his/her stomach hurts'

zero marker for the Attributive Construction if the head noun contains a demonstrative or a marker derived from the general classifier if the head noun contains no demonstrative:

(40a) (Kaiping) tʃiek³haun²²sam²¹ neŋ²¹kə³ʔam³³min⁵⁵tɔj⁵⁵hai³²
wear red garment that CL child be
ŋɔi³³ kə³mɔi²¹
1st sg pro CL younger-sister
'that child who wears a red garment is my younger sister'

(40b) (Tengxian) heŋ¹¹lu²²tsɔ³ŋɛn²³¹
walk road CL person
'the person walking on the road'

Such Southern features may be typologically related to areal phenomena spatially and temporally. For example, the use of the existential verb as a Resultative Complement still observed in Kaiping but rarely in modern Yue dialects is attested historically and across certain Han dialects (Yue 2011): (pl = plural, Q = question, prt = particle)

(41) (Kaiping) niek²¹ ʃieŋ³³>³⁵ -ʃiu³³kai³³ma³³?
2nd pl pro raise+PERF-have chicken Qprt?
'do you raise chickens?'

The use of an indirect object marker grammaticalized from motion verbs, such as 'to cross' in the Conghua Jiekou 从化街口 dialect (Peng 2004:327), which phased out after the mid-20th century in Cantonese:

- (42a) (Conghua) hou³⁵, tsi⁵⁵ pei⁵ fan²³ >³³ ku²³ >³³ ji²³
 good, CL pen give RES cross 2nd sg pro
 'okay, (I) give the pen back to you'

or 'to come' in Nanhai Jiujiang:²⁰

- (42b) pei⁵⁵ pei⁵ pun³³ lei³³ ɲai²⁴
 give one half come 1st sg pro
 'give me half'

Both recall the use of markers grammaticalized from motion verbs, 'to go' or 'to come', not only in Southern Min and Wu, in Tai (e.g., Thai) and in Tibeto-Burman (e.g., Lahu) but also in the earliest extant Chinese document of 13th century BCE, the oracle bone inscriptions, where the indirect object marker, if used, is derived from the verb 'to go'.²¹

13.3.4 Lexical Features

There are at least six lexical strata in Yue: Common Han, Archaic Han residue, Southern Han, loan, non-Han aboriginal, and native Yue.

The Common Han stratum has cognates across the Han languages. Examples include /ɲen²¹/ 'human being', /fɔŋ⁵⁵/ 'wind', /a:p⁴⁴/ 'duck', /tsok⁵/ 'bamboo', /tshɔi⁴⁴/ 'vegetable', /peɪ³³/ 'nose', /pak³³/ 'white', /tshɔ²⁴/ 'to sit', /hoi⁵³/ 'to open', and others.²²

The Archaic Han residue stratum contains words no longer used in the colloquial speech of the modern Northern Han languages (except perhaps those in the periphery of the Central Plains) but still used in Yue and sometimes also in other Southern Han languages—for example, /ha:ŋ²¹/ 'to walk', /jik³/ 'wing', /sik³/ 'to eat', /ɲem³⁵/ 'to drink'. Certain crystallized colloquial phrases in Cantonese remind us of Archaic syntax. For example:

- (43a) weɪ²¹ nei²⁴ si³³ mən³³
 only 2nd sg pro RESUMPTIVE pro ask

'you are solely responsible for ...'

- (43b) m²¹ kwa:i⁴⁴ tsi⁵⁵ tək⁵
 NEG blame 3rd sg pro can
 'cannot blame it = no wonder'

The Southern Han stratum includes items generally used among the Southern Han languages (and perhaps Han languages spoken in the periphery of the Central

Plains), for example, /fu:t⁴/ 'to be wide', /fən⁴⁴/ 'to sleep', /həu³³-sa:ŋ⁵⁵/ 'to be young', /kwen³⁵-soŋ³⁵/ 'boiling water'.

The stratum of loanwords consists of old loans and newer loans. For example, /phou²²θei²²-tsɪ³⁵/ 'grapes' is an ancient loan from about the Tang Dynasty no longer used in other Han languages. More recent loans are mostly from English. They may be pure phonetic loans (e.g., /kha:t⁵⁵/ 'card', /pɔ⁵⁵/ 'ball', /nk⁵si³⁵/ 'taxi', /mei⁵⁵/ 'mile', /ha:ɪ⁵⁵/ 'necktie, vehicle tire') or compounds with a phonetic loan plus a native morpheme (e.g., /sət⁵-sa:m⁵⁵/ for 'shirt' and /la:ŋ⁵⁵-sa:m⁵⁵/ for 'sweater') where the first syllable is an English and a French loan, respectively, and the last syllable a native word for 'upper garment'. Some are borrowed from other Han languages—for example, [kha⁵⁵la:u⁵⁵je⁵⁵] 可惱也 'can+upset+FP = irritable' is probably a loan from the language of Pekingese opera. The most recent loans are from the national *koine*, Standard Mandarin—a tendency to replace vulgar words with those from the high language. The great majority of these already occur as literary items in the written form so far. It is basically a switch from the written to the spoken form. The replacement of /kei⁵⁵-na³⁵/ (chicken+female) with /mou²⁴-kei⁵⁵/ (mother+chicken) for 'hen' involves not only the substitution of the female gender marker but also the change of word order of suffixing to prefixing. Other items include /tsi⁵⁵tsy⁵⁵/ instead of the native /kham²²ɲou³⁵/ for 'spider'.

The non-Han aboriginal stratum has yet to be researched in detail. A number of words bear similarity to forms in the Tai language (Thai as example in parentheses): /mi⁵⁵/ ([mi⁴¹]) 'this', /la:n⁵⁵/ ([khlān³³]) 'to crawl', /nəm²²/ ([nɔm³³]) 'soft', /nəŋ⁵⁵/ ([nəŋ²¹]) 'skin' of /nəŋ⁵⁵kei⁵⁵/ 'goose-flesh', /səŋ⁴⁴/ ([səŋ²²]) 'to blow the nose', /kəp⁴/ ([kɔp²²]) in /kəp⁴kwai³⁵/ 'frog', /hən²²/ ([khan³³]) 'to itch', /lɔk⁵/ ([lɔuk⁴¹]) 'child' of /lɔk⁵ɲu³⁵/ 'pomegranate', /təp³/ ([tɰp⁵⁵]/[tɔp²²]) 'to beat', 'to pound'. A few remind us of the Li language: /mi:t⁵⁵/ 'to pinch' (Li [mit]), /sou⁵⁵/ 'to give birth' (Li [hou]), and so on.

The native Yue stratum is difficult to specify since at present we do not have sufficient information from the non-Han languages or even various Han languages to claim that items in this stratum are unique to Yue. A tentative list includes /mɯ⁵⁵/ 'to squat', /məŋ⁵⁵/ 'to pull', /na⁵⁵/ 'scar', /na:n⁴⁴/ 'mosquito bite', /həm³³p(ə)la:ŋ³³/ 'all, entirely', /tɪm³³/ 'straight', /lɔn³³tsɔn³³/ 'clumsy', /nɯŋ⁵⁵/ 'scorched', /ŋa:tsa³³/ 'take up space', /jeɪ²⁴/ 'bad, naughty', /ŋa:m⁵⁵/ 'to be correct', /ɔŋ³⁵/ 'to push', /lɛm²²kɰm²²/ 'gobble down', and others.

13.4 SUBGROUPS

The Yue language is spoken in at least eighty-eight prefectures and cities—fifty-seven in Guangdong and thirty-one in Guangxi—each comprising a number of towns and villages. Classification and subclassification of languages and dialects are "merely for the convenience of summarizing shared linguistic characteristics" (Yue 1988:32). The

following chart shows a classification based on the historical changes in the systems of tones, initial consonants and finals of 104 Yue dialects and subdialects (with example dialects given earlier):²³

| Yue language | | |
|-----------------------------|---|--|
| Delta group | Guangfu 广府 subgroup North Delta subgroup South Delta subgroup | Cantonese, Xinyi, Conghua, Gaozhou Nanhai, Shunde, Gaoyao, Gaoming, Tengxian Zhongshan; Dongguan, Lianzhou; Huazhou, Rongxian, Bobai, Yulin |
| Wu-yi Liang-Yang group 五邑两阳 | Wu-yi Liang-Yang | Taishan; Kaiping Yangchun |

The Delta and the Wu-yi Liang-Yang groups differ in their tonal system and tonal value as well as plural marking. The Guangfu subgroup is distinguished by syllables with aspirated voiceless initial consonants in Yang Ping or in Yang Shang tone, the North Delta by unaspirated surds in such type of syllables in colloquial words and the South Delta subgroup (except for Zhongshan dialect) by aspirated voiceless initial consonants in syllables with the Yang Qu and Yang Ru tones. The Wu-yi subgroup is marked by the merger of the Yin Ping and the Yin Qu tone and the Liang-Yang subgroup by higher pitch value for the Yang than the Yin tones.

NOTES

1. The term "Bai Yue" appears in the *Historical Records* by Sima Qian (145/135-86 BCE?): "(Qin emperor) took the land of the Hundred Yues to form the prefectures of Guilin (present-day eastern Guangdong and most of Guangxi province), Xiang (present-day southern Guangxi, and northern Vietnam) and Nanhai (present-day central and eastern Guangdong)." The *Han Chronicles* by Ban Gu (32-92) has a reference to people in the land of the Yue with "tattooed body and cut hair." Another reference to "Yue" is to the name of an ancient state, alias Yu Yue, in the Spring and Autumn period occupying the area of present-day northern Zhejiang, eastern Jiangxi, southern Anhui, a small portion of southeastern Shandong, and most of Jiangsu province during the early Warring States period.
2. Zhao Tuo 趙佗, an official of Longchuan (in present-day western Guangdong) and acting officer for the Nanhai prefecture, taking advantage of the downfall of Qin, annexed the Guilin and Xiang prefectures, declaring himself King in 206 BCE with its capital in Panyu. The Nan Yue kingdom was subjugated by Han forces in 111 BCE.
3. Zhengzhang (1991) claims that the song existed around 528 BCE, since its Chinese version was written by a Chu person in the *Chuici* style during the Warring States period.
4. Despite the fact that in 214 BCE the Ling Canal was dug to connect the Xiang River with the Li River, with 15,000 women subsequently transported into Nan Yue to enter into marriage with the immigrants (Ge 1997:1:182).
5. According to the *Linguistic Atlas of China* (1987), Yue speakers in China mainland, based on the 1980 census, totaled over 40 million (28+ million in Guangdong and 12+ million in Guangxi), while overseas speakers using Yue as their mother tongue numbered around 5 million. New figures can be expected soon.

6. This thesis was first expounded in Yue (1972a:14).
7. More precisely, the Yang category of the Shang tone. The terms "Yang" and "Yin" refer to tonal categories occurring in syllables originally with voiced and voiceless initial consonants, respectively. Numerical superscripts designate tonal value on a 5-point scale. Examples unspecified of dialect are from my mother tongue—a Hong Kong variety of Cantonese. Dialect materials without given sources are from my own field work.
8. Interestingly enough, the former type is also found in the Xiang language and the latter in Kejia (Hakka). Reference to Tai is based on Li (1977: sections 4, 6, 9, 10, and 12); Bobai is based on Wang (1932).
9. The so-called Ru Tone is short and checked, occurring in syllables ending with a consonant: -p, -t, -k, or -ʔ; and the Yin category in Yue is generally higher in pitch than the Yang category. The feature [±high] pitch correlates with the feature [±lax] vowel in proto-Yue and Tai. Information of Yulin comes from Dr. Zhou Lieting (personal communication).
10. Taishan Dancun (Taishan) is based on Yue (2005) and Zhongshan Shiqi (Zhongshan) on Chao (1948).
11. Tonal categories are indicated by single numbers: ³ = Yin Shang, ⁴ = Yang Shang, ⁵ = Yin Qu, ⁶ = Yang Qu.
12. Such diminutive form may carry a nasal ending or have a plosive ending changed into a nasal in the second syllable reduplicate.
13. The phrase [khei²⁴>³⁵y⁴⁴] derives from: [khei²⁴] 'stand' + [hei³⁵] 'locate' + [y⁴⁴] 'place'.
14. Wang (1932) gives tonal categories. Tonal value is deduced from the graphs given on pages 79-81.
15. 'Rice+fragrant' in Nanhai Jiujiang.
16. Since there is insufficient information on this topic across the Yue dialects, the description centers on Cantonese and Taishan.
17. The Huozhou 霍州 dialect of Shanxi also has this aspect.
18. Aspects are suffixed to the verb while aspectual complements, though occurring immediately after the verb, allow both the affirmative and the negative potential markers to appear between them.
19. The Huozhou dialect of Shanxi is also known to have this resumptive aspect, but, unlike Yue, it is different in form from the turning-around aspect.
20. The use of 'to come' may indicate a 'direction toward' and may be due to the fact that the indirect object is the first-personal pronoun. Limited data on this dialect prevent us from making solid judgment.
21. For details, see Chin (2009, chapters 5 and 6).
22. Forms enclosed within slanted lines, /xx/, indicate words represented with Cantonese pronunciation but include cognates with variant pronunciation in other Yue dialects.
23. For details see Yue (2006:76-77), which is a revision of Yue (1988) where thirty-six isoglosses sum up the linguistic features (thirty-three phonological and three lexical) of fifty-nine dialects.

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CHAPTER 14

WU DIALECT

SHANGFANG ZHENGZHANG AND WEI ZHENG

14.1 INTRODUCTION

YUAN et al. (2001:22) divides Chinese varieties into seven dialect groups, including Mandarin (Beifanghua 北方话), Wu 吴, Xiang 湘, Hakka 客家, Gan 赣, Cantonese 粤, and Min 闽 dialects. Hou (2002) claimed ten dialect groups, separating Jin 晋, Hui 徽 dialects and Pinghua 平话 from Mandarin. In both of them, Wu dialect is taken as one of the major dialect groups of Chinese, spoken in the south of the Yangtze River, part of Jiangsu Province, Shanghai, and Zhejiang, as well as in some areas of Jiangxi, Fujian, and Anhui. Wu area covers nearly 140,000 square kilometers with about 70 million speakers.

It has been more than 2,000 years since the formation of Wu dialect. It is assumed that Wu dialect originated from ancient Chu 楚 dialect at the earliest stage (Zhengzhang 1998:288). Around the beginning of the Common Era, there lived the ancient Hundred-Yue (Baiyue 百越) people who spoke Kam-Tai language in the middle and lower reaches of the Yangtze River. The Yue people living in different areas were called differently. Those in Kuaiji 会稽 were called “the Yu-Yue” 於越, those in Wenzhou “the Ou-Yue” 瓯越 or “the Eastern-Yue” 东越, those in Anhui “the Yang-Yue” 扬越, in Fujian “the Min-Yue” 闽越, in Guangdong “the Southern-Yue” 南越, in Guangxi “the Western-Yue” 西越 or “the Luo-Yue” 骆越, and in the regions of the Yangtze and Han Rivers “the Mountain-Yue” 山越.

Zhengzhang (1987) divides Wu dialect into six subgroups, namely Taihu Lake 太湖, Taizhou 台州, Dongou 东瓯, Wuzhou 婺州, Chuqu 处衢, and Xuanzhou 宣州. Taihu subgroup, also named Northern Wu (NW), is the largest one. Wang (2005) also proposes a reclassification of three subclusters in NW, namely Subujia 苏沪嘉, Piling 毗陵, and Shaoxi 苕溪. Wang proposes that Shanghai be an independent subcluster, separated from Subujia, while the remaining part of Subujia combines with Shaoxi into a new Subujia subcluster. Cao (2002:171–173) reclassifies Southern Wu (SW) into three subclusters: Jinqi 金衢, Oujiang 瓯江, and Shangli 上丽, with two subgroups, Shangshan 上山 and Lishui 丽水.

14.2 THE HISTORICAL BACKGROUND OF THE FORMATION OF THE WU DIALECT

Geographically, the Wu area is adjacent to that of Jiang-Huai 江淮 Mandarin, Hui, Gan, and Min. Wu dialect took shape in the south of Jiangsu (i.e., the region of Suzhou, Wuxi, Changzhou, and Nanjing), then spread to the south of Yangtze River in Anhui and Hangjiahu 杭嘉湖 Plain in the north of Zhejiang and ultimately reached the middle, south, and southwest of Zhejiang. As far as the number of migrants from north China is concerned, there are more northern migrants settling in the south of Jiangsu and the north of Zhejiang than the middle and south of Zhejiang. Over the Six Dynasties period (220–589 CE), East Jin 东晋 was founded with its capital at Jinling 金陵 (modern Nanjing 南京). You (2000) points out that a large body of Chinese officials from the collapsed Western Jin Dynasty moved into Jinling and its neighboring areas. Those migrating into Zhejiang mostly settled down at the prefecture of Kuaiji. Plenty of migrants from the north Jiangsu also moved southward to the north Qiantang River 钱塘江. Hence, it's probable that the Wu dialect of those areas was easily influenced by Northern Mandarin.

It is generally assumed that Wu areas, such as Shanghai, Zhejiang, southern Jiangsu, and northeastern Jiangxi, were governed by the Wu and Yue kingdoms. According to some records of ancient Yue language, including *Yueren Ge* 越人歌, *Weijialing* 维甲令, and *Yuejueshu* 越绝书, the ancient Yue language spoken by the ancestors of Kam-Tai people should be non-Chinese. The situation was unchanged until the destruction of the Yue kingdom by the Chu kingdom. After that, the ancient Chu language was gradually replaced by the ancient Yue language that became the basis of several modern dialects.

Since the establishment of Kuaiji and Wu by Qin 秦 and Han 汉, the Mandarin, which was the prevalent speech of north-central China, spread southward. Through merging together with the Eastern Chu 东楚 language, it gradually became the Jiangdong 江东 dialect in the period of Han, Six Dynasties, and it is now regarded as the proto-dialect of modern Wu, Min, Hui, and Jiang-Huai dialects. Finally, Wu dialect came to be an independent dialect in the Tang Dynasty after the separation from Min. It is a prolonged historical process for the transformation of these languages. There's no way we can trace the early record of Wu dialect from historical literatures until the Western Han Dynasty (206 BCE–24 CE).

The status of Wu dialect has undoubtedly been confirmed at least in the Eastern Jin Dynasty, although the evidence of the Yue people's living in South China at that time is plenty. For example, the poetic rhyming schemes in the texts of some historical documents follow early Wu dialect spoken in the Jiangdong area. Additional evidence reflecting southern Chinese dialects can be found in the commentaries and folk songs in the Southern Dynasty and *Shi Shuo Xin Yu* 世说新语. Many of these elements are retained more or less in modern Wu. Based on the historical phonology in Wei-Jin 魏晋 periods, Ting (1975)

found several characteristic features shared by early Wu dialects, such as the phonological mixture of the rhymes *Zhi 支* and *Zhi 脂* in *Qieyun* 切韵 (601 CE). Zheng (2010:76) points out that the demonstrative *Er 尔* which appeared in *Shi Shuo Xin Yu*, is preserved in some Wu dialects.

Qieyun, which represented a standard of correct speech common to the educated classes in the north and south China in the 6th century, aimed only at the provision of phonological information, including initials and finals of Chinese syllables. The semantic explanation of characters was very simple or even omitted. Many scholars commenced to add lexical commentaries to *Qieyun* during the Tang Dynasty. The record of Wu dialects can be seen in the fragments of some editions of *Qieyun* (see Zhengzhang 2010:85).

14.3 THE SYNCHRONIC PHONOLOGICAL TRAITS OF WU DIALECT

The synchronic traits of Wu dialect discussed here are of two levels: phonetic and phonological.

14.3.1 Voiceless Plosives

Chao (1935) pointed out that the phonetic implication of voiceless plosives of Beijing Mandarin and Shanghai dialect are actually quite different although they are transcribed the same as /p t k/. Chao (1935:516) said, "When someone who speaks Shanghai dialect or other similar Wu learns to pronounce the unaspirated stops /p t k/, he or she can easily use /p t k/ of his or her native dialect as a replacement" (our translation). Hence /p t k/ in Shanghai dialect are real voiceless plosives while their phonetic value in Beijing Mandarin is /b d g/. Compared to /p/ in Shanghai, /b/ in Beijing is lenis voiceless stop. For example, 'gebi de dengzi' 隔壁的凳子 'the neighboring chair' is pronounced /gʷɿdɿ dɿŋ dʰɿ/.

14.3.2 Voiced Plosives

Chao (1935:517–518) said, "When a person from Shanghai reads 'big boy' in English as /phk pʰɔi/, it sounds like some remarkable voiced aspiration is increased and voiced b doesn't appear." Chao noticed that the voiced stops in Wu dialect actually are not fully voiced and transcribed so-called "voiced stops" as /pʰ tʰ kʰ/. Based on the study of Chao, the phoneticians later named the previously mentioned sounds as *Qin Yin Zhuo Liu* 清音浊流 (the breathy voiceless stops).

14.3.3 Implosives

This group of sounds was previously termed preglottal stops, inspiration sounds, and so on. Chao (1935:518) mentioned that there is “a voiced /b/” accompanied by the striction of glottis in the dialects in the suburb of Shanghai (e.g., Pudong and Songjiang, and Yongkang in Zhejiang). Chao symbolized it as /b/. The phonetic value of the initial in the syllable *bing* 冰 ‘ice’, which is pronounced /ʔben/ in Wenchang, Hainan, is similar to /b/ in Wu dialect. According to Zhengzhang (1995a:67), implosives were investigated in Chuansha, Jinshan, Nanhui, Fengxian, Jiading, Minhang in Shanghai and Qingyan, Wencheng, Yongjia, Xianju, and Jinyun in Zhejiang. The members of implosive include /ʔb ʔd/ (the other symbols are /b d/). It’s noticeable that there is a palatal implosive /ʔj/ in Nanhui, Shanghai.

14.3.4 The Three-Way Distinctions Among Stops

Chao (1928:vii) called the phenomenon “tripartite division of initial stops.” He classified Chinese dialects mainly based on the development of Middle Chinese (MC) voiced stops into modern dialects. A three-way distinction among stops is clearly demonstrated in /p^h b/ (MC initials *Bang* 幫, *Pang* 滂, and *Bing* 並), /t^h d/ (MC initials *Duan* 端, *Tou* 透, and *Ding* 定), /s ts^h dz/ (MC initials *Jing* 精, *Qing* 清, and *Cong* 从). On the other hand, some Wu dialects spoken along the boundaries between the areas of Wu and non-Wu dialects have been losing the important feature of the typical Wu. The words with MC full voiced initials have partly been voiceless in Danyang, Jiangsu. Pucheng dialect in Fujian also lacks the feature of voicing completely (Pan 1986:3). Accordingly, this feature is often used as a criterion to distinguish Wu from non-Wu dialect. However, many historical linguists claim that a common feature in different languages or dialects resulted from a shared retention doesn’t work when employed to decide the genetic relationship among them. For instance, many Xiang dialects also have a three-way distinction in stops (e.g., Qiyang, Dong’an, Lingling, Mayang, Chengbu, and Xinning). In addition, Zhengzhang (1995b:13) finds that the preservation of full voiced initial consonants in MC can be seen in some Gan, Min, and other dialects besides Wu and Xiang. However, it is believed that Xiang dialects can’t be synchronically classified together with Wu dialects.

14.3.5 Loss of Initials

The initial consonant /c/ is often dropped among Wu dialects in the southwest of Zhejiang, including Longquan, Qingyuan, Jingning, Taishun, Yunhe, Lishui, Qingtian, Jinyun, Yongkang, Dongyang, Longyou, Lanxi, Jiande, Shouchang, Chun’an, Jiangshan, Quxian, Changshan, Kaibua, and Su’ān (see Zhengzhang 1995a:51–52); for instance, *jiā* 嫁 ‘marry’ /yo⁵ /, *jiào* 叫 ‘shout’ /iɑ⁵ /.

14.3.6 Affluence of Monophthongs

The phonetic value of several rhymes in *Qieyun* is reconstructed (e.g., the rhyme *Hai* 哈, *Tai* 泰, *Hou* 侯 and *Hao* 豪). Generally speaking, the sounds of those diphthongs become monophthongs. Take some Wu dialects as examples:

Suzhou: *Cai* 菜 tshe⁵, *Tai* 太 tha⁵, *Ou* 呕 y³, *Hao* 好 hæ³;

Wenzhou: *Hai* 海 xe³, *Dai* 带 ta⁵, *Gao* 高 kɔ¹;

Longyou: *Sai* 赛 se⁵, *Cai* 蔡 tshə⁵, *Jiao* 交 kɔ¹

In contrast, some other subdialects of Wu may have more diphthongs because of the influence of Mandarin (e.g., *Lai* 来 lei², *Ou* 欧 ei¹, *Hou* 厚 gei⁶, *Hao* 豪 fiw² in Changzhou dialect).

14.3.7 The Glottal Stop Endings

The stop endings /p t k/ in MC have merged into a glottal stop /ʔ/ in modern Wu dialect. Similarly, it has taken place in the colloquial strata of Min dialect.

14.4. THE DIACHRONIC PHONOLOGICAL TRAITS OF WU DIALECT

The comparison between *Qieyun* and modern dialects is indispensable to a better knowledge of the historical development of Chinese dialects. Based on our observations, this section lists some important features of colloquial strata in Wu dialect that are consistent with the *Qieyun* system.

- (1) Retention of the same value between initial *Fei* 非 and *Bang* 幫. For example, 飛 反翻动 夔 夔 is pronounced /p-/ in Suichang dialect.
- (2) Retention of the same value between initial *Feng* 奉 and *Bing* 並. For example, 扶 缚 冯 is pronounced /b-/ in Qingyuan dialect.
- (3) Retention of the same value between initial *Wei* 微 and *Ming* 明. For example, 问 闹 味 尾 is pronounced /m-/ in Suzhou dialect.
- (4) Retention of the same value between initial *Zhi* 知 and *Duan* 端. For example, the characters 猪 昼 转 张 着 桩 桌 中 竹 are all pronounced /t-/ in Changshan dialect.
- (5) The value of the character *Zhai* 摘 ‘to pick’ in Wu dialect is also pronounced /t-/. The phonetic value of initial *Xia* 匣 is velar plosive /g/. The reading of the character *hou* 厚 ‘thick’ is /gei⁶/ and *huan* 环 ‘circle’ is /gue²/ in Changzhou, a NW

- dialect. Many more examples are found in other SW dialects that the initial of 街(街) 糊怀厚含寒江挟涪降 is also pronounced /g/ or /k/.
- (6) Retention of nasal initial R 日. For example, the initial value of 耳儿日 is /n/ in Changshu dialect.
- (7) The low vowel of rhyme Ge 歌. For example, the reading of Duo 多在 Duonian 多年 'many years' is /ta/ and Tuo 拖 in tuobiti 拖鼻涕 'the nose mucus drawn' is /tha/. More examples can be seen in SW Zhengzhang (1983) assumed that the final sounds of MC rhyme Ge with low vowel /a/ or /a/ in SW can date back to the Han Dynasty.
- (8) The sound of the rhyme Yu 鱼 'fish' in MC is the nonrounded vowels like /s ei u/, different from that of the rhyme Yu 虞 'worry' read as rounded vowels. See the examples in Longyou dialect: Qu 覩 tchi⁵, Xu 絮 ci⁵, Shu 鼠 tsh³, Shu 薯 zi⁰, Ju 锯 kau⁵, Yu 鱼 nau², Xu 许 xau², Yu 余 i² (the rhyme Yu 鱼); Qu 趣 tchy⁵, Chu 厨 dzɿ², Shu 输 cy¹, Ju 句 tcy⁵, Qu 瞿 dzɿ², Yu 愚 nɿ², Yu 愉 y² (the rhyme Yu 虞).
- (9) The sound of the rhyme Tai 泰 in MC is low vowels, distinctive from the rhyme Hai 哈, e.g. Tai 胎 the¹, Dai 待 de⁶, Gai 盖 ke⁵, Ai 哀 e¹ (the rhyme Hai) and Tai 泰 tha⁵, Lai 赖 la⁶, Cai 蔡 tsha⁵ (the rhyme Tai) in Shanghai dialect.
- (10) A distinction between the rhyme Ji 祭 in MC and the rhyme group Zhi 止: in the period of rhyme tables, e.g. Zhi 制 tci⁵, Shi 时 cie⁵ (the rhyme Ji) ; Zhi 枝 tci¹, Zhi 指 tci³, Zhi 志 tci⁵, Zhi 治 dzi⁶, Shi 时 zi², Shi 视 zi⁶ (the rhyme group Zhi) in Wuyi dialect.
- (11) The sound of the rhyme Qi 齐 in MC is the non-high vowel. Take the pronunciation of the character 梯 'ladder' as an example: /thei/ in Pan'an, Suichang, and Yunhe, /die/ in Jimhua, Tangxi, and Changshan and /huai/ in Guangfeng dialect.
- (12) A distinction between the rhyme Zhi 支 and Zhi 脂 in MC, e.g. Zhi 枝 tci¹, Zhi 纸 tci³ (the rhyme Zhi 支) and Zhi 指 tsui³, Shi 师 sui¹, Zhi 隹 tsui⁵, Shi 时 zui² (the rhyme Zhi 脂 and Zhi 之) in Kaifu. The final vowel between the group of 支纸池匙 and 志指迟时 is different in Wenzhou dialect.
- (13) A distinction between the rhyme Hao 豪 and Yao 肴 in MC, e.g. Bao 报 pa⁵, Mao 毛 ma², Dao 刀 ta¹, Lao 老 la³, Zao 灶 tsa⁵, Sao 嫂 sa³, Gao 稿 ka³, Hao 号 a⁶ (the rhyme Hao); Bao 豹 pau⁵, Mao 豹 mau³, Nao 闹 nau⁶, Chao 吵 tshau³, Chao 巢 sau², Jiao 交 kau¹ in Taishun dialect.
- (14) A distinction between the rhyme Han 寒 and Shan 山 in MC, e.g. Dan 单 tɕ¹, Tan 摊 thɕ¹, Dan 弹 thɕ², Dan 蛋 da⁶, Lan 拦 lɕ², Zan 赞 tsã⁵, Can 餐 tsã¹, San 伞 sɕ³ (the rhyme Han); Zhan 盏 tsã³, Shan 山 sã¹, Chan 产 tshã³, Zhan 栈 dzã⁶ (the rhyme Shan) in Yushan dialect.
- (15) A distinction between the rhyme Xian 仙 and Xian 先 in MC, e.g. Mian 面 mi⁶, Lian 连 lie², Yan 戾 ie⁵, Jie 接 tci², Jie 劫 tci² (the rhyme Xian 仙); Mian 麵 mi⁶, Lian 莲 lie², Yan 烟 iɕ¹, Jie 竹 tciã², Qie 切 tchiã², Jia 挟 ie² (the rhyme Xian 先) in Qingyuan dialect.
- (16) A distinction between the rhyme Tan 覃 and Tan 谈 in MC, e.g. Tan 潭 de², Nan 南 ne², Can 蚕 zee², An 暗 ee⁵, He 盒 hee⁸ (the rhyme Tan 覃); Dan 淡 da⁴,

Lan 蓝 la², San 三 sa¹, Kan 甘 kɔ¹, Ta 塔 thɔ² (the rhyme Tan 谈) in Wencheng dialect.

- (17) A distinction between the rhyme Deng 登, Geng 耕 and Geng 庚 庚二 (the Division II of the Geng initial group in the rhyme table) in MC, e.g. Peng 朋 pai⁻³³, Deng 灯 tai¹, Neng 能 nai², Ceng 层 zai², Ken 肯 khai³, Bei 北 pe², Te 特 de⁴, Zei 贼 ze⁴ (the rhyme Deng); Meng 猛 ma⁴, Da 打 na³, Cheng 撑 tsha⁷, Sheng 生 sa¹, Keng 梗 kua³, Ying 硬 a⁶, Xing 行 a², Bai 白 ba⁴, Chai 拆 tsha⁷, Ge 格 ka⁷, E 额 a⁴ (the rhyme Geng Er); Zheng 争 tsa¹, Geng 耕 ka¹, Mai 麦 ma⁴, Ce 册 tsha⁷, Ge 隔 ka² (the rhyme Geng) in Tangxi dialect.
- (18) A distinction between the rhyme Dong San 东三 (the Division III of the rhyme Dong) and Zhong 钟 in MC, e.g. Long 隆 long², Chong 銃 tchyon⁵, Xiong 雄 yon², Liu 六 lau⁸, Qu 糶 tchiãu⁷ (the rhyme Dong San); Long 龙 lie², Zhong 重 dzɿ⁴, Yong 用 jɿ⁰, Lü 绿 lo⁸, Qu 曲 tchyɿ⁷ (the rhyme Zhong) in Wenzhou dialect.
- (19) Tone splits of the four tone categories, i.e. Ping 平 'level', Shan 上 'rising', Qu 去 'departing' and Ru 入 'entering' tone in MC conditioned by the contrast of voiced and voiceless initials. Some conservative Wu dialects exemplify the tonal system consistent with that in MC, e.g. Dong 东 toŋ⁵² (the Yin Ping tone), Tong 同 doŋ³⁴ (the Yang Ping tone), Dong 董 toŋ⁴⁴ (the Yin Shang tone), Dong 动 doŋ³¹ (the Yang Shang tone), Dong 冻 toŋ³³⁴ (the Yin Qu tone), 洞 doŋ³¹⁴ (the Yang Qu tone), Du 督 toŋ²⁵ (the Yin Ru tone), and Du 读 do²³ (the Yang Ru tone) in Changshu dialect.

14.5. THE LEXICAL AND SYNTACTIC TRAITS OF WU DIALECT

The same word may have different meanings between Wu dialects and Mandarin. See some examples follow:

| | Wu | Mandarin |
|----------|--------------|----------|
| Chang 长 | tall or long | long |
| Jiao 脚 | foot and leg | foot |
| Zhuang 壮 | fat | strong |
| Mian 面 | noodle | flour |

Wu dialect preserves a lot of words used in ancient Chinese but seldom employed in modern north Mandarin. For example (the pronunciation cited here is from Suzhou dialect): bi 漉 /pi²/ 'to dry', dun 黓 /an⁵/ 'to castrate a rooster', tui 燧 /p^han⁵/ 'to kill a rooster or hen', tou 散 /p^hy⁵/ 'to spread', da 汰 /da⁶/ 'to wash', kang 罨 /kɔŋ⁵/ 'to hide', qin 揪 /tɕ^hin⁵/ 'to press', han 憨 /gɔŋ⁶/ 'foolish'.

In light of the syntactic features, several characteristics in the modern Wu dialect worth mentioning are listed as follows:

- (1) The negatives include *wu* 勿 /v-/ , *fu* 弗 /f-/ and *wu* 唔 /m-/ , different from *bu* 不 which is popular in north Mandarin.
- (2) The genitive marker is *ge* 个, etymologically assumed to be the descendant of the classifier *ge*, not *de* 的.
- (3) The third pronoun is *qu* 渠, not *ta*, except in a few dialects such as Changzhou, Jiangyin, and Yixing where Mandarin exerts much more effect.
- (4) The noun prefix *a* 阿 and *lao* 老 are used at a high frequency, for example, *a ge* 阿哥 'older brother', *a zhi* 阿侄 'niece', *a bo* 阿伯 'uncle', *a nan* 阿囡 'daughter', *a da* 阿大 'the oldest brother or sister', *A fu* 阿福 'a first name for males' and *A Ying* 阿英 'a first name for females'; *laochong* 老虫 'mouse', *laoya* 老鸦 'crow', *laoban* 老板 'boss', *laoshi* 老师 'teacher', *Lao Chen* 老陈 'a last name', *laopo* 老婆 'wife' and *lao xiong* 老兄 'older brother'.
- (5) The noun suffix *zi* 子, *er* 儿 and *tou* 头 are prevalent, for example, *bitou* 鼻头 'nose', *egutou* 额头 'forehead', *ritou* 日头 'the sun', *xingtou* 行头 'dressing', *zuotou* 昨天 'yesterday', *mingzhaotou* 明朝头 'tomorrow', *yetou* 夜头 'evening', *liangkuaitou* 两块头 'a two-Yuan currency', and *yijitou* ... '记头 'one time'. According to Liu (2008:568), the noun suffix *toushi* 头势 in Suzhou dialect is also highly productive.
- (6) Liu (2001) recently pointed out that Wu dialects are less typical than Mandarin as a subject-verb-object type but more typical than it as a topic-prominent one. Besides, compared with Mandarin, the postposition system in Wu is much more advanced due to a larger number of highly grammaticalized postpositions, although Wu dialects are rich in both prepositions and postpositions.

14.6 THE RELATIONSHIP BETWEEN WU AND NON-WU DIALECTS

This section briefly discusses the effects of Mandarin and other neighboring dialects on the development of Wu dialect.

14.6.1 The Effects from Mandarin on Wu Dialect

- (1) The sound of the *jian* 见 initial group with the Division II in MC is /k/ literarily and /c/ colloquially, respectively. For example, *jia* 家 'house' is pronounced /ka/ or /cia/ in Suzhou and /ko/ or /cia/ in Shaoxing dialect. There is only a velar sound in the area of Jinhua southward.
- (2) Generally speaking, the colloquial sound of the *Yi* 疑 initial in MC is nasal /n/. Like Mandarin, the phonetic value of the category is now zero initial in the literary stratum in Suzhou dialect (e.g., *Yi* 义 *fi*⁶, *Yue* 乐 *fi*o⁷s in *yinyue* 音乐 'music', *Yu* 鱼 *fy*²).

- (3) Piling subgroup of NW and Hangzhou dialect have been highly influenced by Mandarin. For example, the pronoun system is *wo* 我 'I', *ni* 你 'you' and *ta* 他 's/he', and the genitive marker is also *De* 的 in the modern Hangzhou dialect.

(4) Xuanzhou subgroup of Wu dialect and Jiang-Huai Mandarin are spoken in the same area in Anhui. Hence Mandarin has unavoidably been affecting the Wu dialect there, leading to the shrinking of the dialect area from the whole county to its suburbs and even endangering the very survival of the Wu dialect in some areas. On the other hand, Xuanzhou Wu subgroup and Jiang-Huai Mandarin share some common traits such as the /ŋ/ sound of *Ying* 影 initial, the fusion of *Ni* 泥 and *Lai* 来 initial in MC, the reading of the character *hong* 虹 'rainbow' is the same to *gang* 杠 'flagstaff' and the negative is *bu* not *fu*.

14.6.2 The Historical Relationship Between Wu and Min Dialect

- (1) As mentioned previously, speakers of Min dialect call people *nong* 侬. The similar sound in SW is /noŋ²/, /naŋ²/ or /naŋ¹/, and we can't trace the word in NW. However, according to Zheng (2010:75-78), the plural suffix of the second pronoun *nong* is used in some towns of Danyang, which comes from the lexicalization of the noun *nong*.

(2) It is well known that the vernacular reading of *Zhi* initial is the same to that of *Duan* initial in Min dialect. Similarly, Chuqu subgroup Wu pronounces the characters 猪竹桌着 the dental /t-/ and 虫肠 长沉 /d-/. This phonetic value is shared as northward as Kathua and Wuyi. It is noticed the value is liquid /l/ (e.g., *zhu* 猪 'pig' l¹, *zhu* 竹 'bamboo' lo² in Wuyi).

- (3) The reading of the *jian* 见 initial group is velars /k kʰ/ together with medial /i/ or /y/. The similar phenomenon appears in Chuqu subgroup (Jiangshan, Yushan, Guangfeng, Jinyun, Pucheng, Yongkang) and Taizhou subgroup (Tiantai and Sanmen).

(4) The demonstrative *xu* 许 is seen in Min as well as Wenzhou (hi³), Yueqing (ci³), and Guangfeng (hx²).

- (5) The phonetic value of the initials of the characters 手笑树 is affricate in Longqu subgroup SW and Min. For instance, like Min dialect, the reading of those three characters is tɕhye³, tɕhiau⁵, dziu⁶, respectively, in Guangfeng. The initial of 火远同睡痒 is /c/ or /h/ in Qingyuan.

14.6.3 The Historical Relationship Between Northern Wu and Hui Dialect

Wu dialect and Hui dialect are contacted in south Anhui and northwest Zhejiang. As a result, Hui dialect is spoken in Jiande and Chun'an of Zhejiang. Like Gan dialect, the full voiced initials in ancient Chinese become voiceless aspirated in Hui dialect except

in Xiyu subgroup, where aspirated and unaspirated sounds coexist, similar to Min. In addition, the value of finals in MC changed dramatically in Hui.

Five detailed phonological features in Hui dialect that can also be found in SW are as follows:

- (1) The *Zhang* 章 initial group characters converge into the *Jian* 见 and *Jing* 精 initial group characters with medial /i/ or /y/.
- (2) The sound of the finals of Division II in *Xie* 蟹 group is /a/ or /ɔ/, similar to the finals of Division I only with the dental-initial words.
- (3) The main vowel of the open finals of *Xian* 咸 and *Shan* 山 groups with Division I, II is /ɔ/ or /ɒ/, similar to the southern dialects of Dongou subgroup in SW.
- (4) The final of long vowels /i: u: y:/ plus ending /-ə -e/ can be seen in Hui dialect, similar to Yongkang dialect in Zhejiang.
- (5) The sound change resulted from *erhua* 儿化 'rhoticalization' can be found in Hui dialect and Taizhou subgroup Wu, for example, *yāner* 燕儿 'swallow' /i:an ʔ/, *shēr* 舌儿 'tongue' /tɕi:an ʔ/ in Tunxi.

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PART 3

LANGUAGE
CONTACT

CHAPTER 15

LANGUAGE CONTACT AND
ITS INFLUENCE ON THE
DEVELOPMENT OF CHINESE
SYNTAX

GUANGSHUN CAO AND HSIAO-JUNG YU

15.1 INTRODUCTION

WHEN scholars look for causes in grammatical development, they have traditionally placed their emphasis on the internal mechanisms of diachronic changes such as analogy and reanalysis (including grammaticalization). Since the 1980s, linguists have increasingly turned to external factors such as language contact and borrowing as underlying forces that can motivate a language to evolve. In the field of Chinese diachronic grammar, a number of studies have been done on the study of external mechanisms in Chinese language development during the past decade, and a few studies have obtained results over the past five years. The research on language contact and its influence on the Chinese language development has become an attractive topic among Chinese linguists. China has a very rich source of extant written material. From the systematic historical records, we know that there were three large-scale language contacts in Chinese history.

15.1.1 Language Contact Through Translation
of Buddhist works During the Medieval Period
(Late Han to Tang Dynasties)

Buddhist ideologies were imported into China primarily through large-scale translations of Buddhist sutras from Sanskrit (or Pali, or certain Central Asian languages)

into Chinese. Between the Late Han (c.200 CE) and the Tang (618–907) dynasties, over 170 translators were involved. Approximately 2,300 Buddhist sutras that contain 56 million characters in 7046 *juan* “fascicles” were translated from Sanskrit or Pali into Chinese. Buddhist ideologies and the language of the Central Asian monks are very different from those of Chinese. To explain Buddhist concepts in Chinese was a very difficult task for the translators. As a result, translators coined new words or adopted certain Chinese words but replaced their original meanings with Buddhist concepts. For example, the Chinese word *se* 色 (from originally meaning “color” in Chinese to “form or things” in Buddhist terms). Syntactically, there are distinctive differences between the language in the Chinese sutras translated during the Medieval Period and that in native Chinese texts of the same period. These consist of two types: the emergence of unusual, innovative features in Chinese and preexisting Chinese features used with excessive frequency in translated Buddhist texts.

15.1.2 Language Contact Under the Mongols' Control (Yuan Dynasty)

During the Yuan Dynasty (1279–1368), the Mongols, a non-Han nomadic people, controlled most of the immensely populous Chinese region as legitimate sovereignty for almost a century. They were markedly different from the Chinese, in terms of culture among other things, and they left a deep impact on various aspects of the Chinese life. As the ruling house, the Mongols instituted the Mongolian language as the official language. In order to foster communication with the Chinese, the Mongols used a mixed Chinese and Mongolian language referred to as *Yuan baihua* 元白话 ‘Yuan dynasty colloquial language’.

The Mongolian influence on the Chinese language is reflected in a large variety of extant Yuan and early Ming documents, which include *Yuandai zaju sanshi zhong* 元代杂剧三十种 ‘Thirty operas of the Yuan dynasty’, *Yuandai baihua bei jilu* 元代白话碑辑录 ‘Records of the stiles of the Yuan dynasty’, *Yuan Dianzhang* 元典章 ‘The Code of the Yuan’, *Yuanchao Mishi* 元朝秘史 ‘Secret History of the Mongols’, various editions of *Lao Qida* 老乞大 ‘the Old Sinologist’, and Chinese language textbooks compiled by Koreans during the Yuan and Ming dynasties.

15.1.3 Language Contact When China Was Ruled by the Manchus (Qing Dynasty)

The Manchus ruled all of China from 1644 to 1911. Both Manchu and Chinese were the official languages of the imperial court. However, a significant shift occurred among the Manchus, whereby they changed from monolingual Manchu speakers (before the

1660s), to bilingual Manchu and Chinese speakers (1660s–1790s), and then finally in greater numbers to monolingual Chinese-speakers (after the 1790s).

When the Manchus first took over Northeast China in the 1620s, the founder of the Manchu nation Huang Taiji (1559–1626), who was also known as Nurhaci, created an official position known as *Qixinlang* 启心郎 (literally ‘clerks who clarifies thoughts’, or ‘interpreters’). Each official bureau had a *Qixinlang* to facilitate communication between the Manchus and Chinese. However, this position had already become superfluous when it was abolished by Emperor Kangxi in 1672, because a large number of Manchus had become bilingual within these fifty some years. From then on, the number of Manchu speakers continued to decline. Official Qing historiographical accounts record that in 1776, the fortieth year of the Qianlong reign, the emperor was shocked and infuriated by the fact that his Manchu subordinates could not speak their mother tongue; the decline of the Manchu language was inextorable by this point.

As the Qing is the dynasty closest to the modern period, abundant documents and texts are still extant. The various linguistic phenomena resulted from language contact can be seen in the imperial edicts and records of the Qing court or literary works such as short stories, operas, and storytellers’ scripts.

Of these three periods of large-scale language contacts, scholarly attention has focused on the language in translated Chinese Buddhist texts of the Medieval Period and in the various documents of the Yuan period. Study of the Qing documents has only begun in recent years.

15.2 CONTACT-INDUCED DISTINCTIVE SYNTACTIC FEATURES

Over the past ten to fifteen years, scholars have pointed out a number of distinctive linguistic features in the language of the translated sutras during the Medieval Period that are contact-induced. Zhu (2011) lists eighteen unusual syntactic features. Examples are (a) the postverbal *yi* denoting completed action; (b) the disposal construction “*qu* 取 OY”; (c) the copular construction with “subject, noun, *shi* 是”; (d) the special usage of the interrogative word *yuanhe* 云何; (e) the cause marker *gu* 故 used at the end of sentences; (f) the genitive marker *suo/xu* 所/许; (g) higher frequency in using *cao/deng* 曹/等 as plural markers; (h) excessive frequency of passive construction.

There are a few atypical syntactic components in *Yuan baihua* pointed out by linguists. For example (a) the SOV word order; (b) the distinction between the inclusive *women* 我们 ‘we’ and exclusive *zamen* 咱们 in first-personal plural pronouns; (c) the postpositioned object case marker *gen* 底; (d) the suffixes encoding causative *shang* /*shangtou* 上/上头; (e) the plural marker *mei* 每; (f) the special use of *you* 有 at the end of a sentence; (g) the particle indicating direct quotation *modao* 摩道.

15.3 SCHOLARLY DISCUSSION OF THE NATURE OF THE LANGUAGE IN THE TRANSLATED SUTRAS AND *YUAN BAIHUA* AND THEIR IMPACT ON THE CHINESE LANGUAGE

There are vast written documents from translated Chinese sutras and *Yuan baihua* that contain ungrammatical or awkward Chinese. Some scholars consider the language as a mixed language or pidgin/creole, while others regard them as interlanguage errors.

Zhu (1992:15) brings up the term *Fojiao hunhe Hanyu* 佛教授混合汉语 'Buddhist Hybrid Chinese' referring to the language in the translated Chinese Buddhist sutras. In 2001, he defined this term as "a unique variant form of the Chinese language." He believes that there are obvious differences between Buddhist Hybrid Chinese and the language in native Chinese texts. Buddhist Hybrid Chinese is a unique variant form that has unnatural mixtures. There are two types of mixture in this language: (a) the mixture of the Chinese language and a large number of linguistic elements from the original language of the Buddhist sutras and (b) the mixture of classical Chinese, vernacular Chinese, and unauthentic Chinese elements (Zhu 2001). Later in a coauthored article, Qingzhi Zhu and Guanming Zhu adopted the term "Buddhist Chinese" in reference to the language in the translated Chinese sutras, as some scholars thought using the word "hybrid" for this language could be misleading (Zhu and Zhu 2006).

Yu (2004) proposes that the special, unauthentic linguistic elements or features in translated Chinese Buddhist sutras are the result of imperfect learning of Chinese due to the interference of the mother tongues of these foreigners. The Chinese they used was essentially an intermediary language, or interlanguage.

Regarding the nature of the language in *Yuan baihua*, scholars also have expressed various viewpoints. Zu (2007:3) suggests that "[*Yuan baihua*] is a Mongolian Pidgin Chinese that takes Northern Mandarin as the superstrate language and the Mongolian language the substrate language." Zu (2008) further claims that *Yuan baihua* more or less is a creolized language. Its lexicon is from the Northern Mandarin of the time, but it also assimilates certain lexical items from other ethnic groups: the grammatical system is based on the Chinese language incorporated with linguistic features from Altaic languages such as Khitan, Jurchen, and Uyghur. This language was the native language commonly used by Chinese people residing in Northern China, including native Chinese and sinicized people such as Khitan, Jurchen, and Uyghur.

Guangshun Cao brings up another point of view. Through analyzing the various types of *Yuan baihua* in the Yuan documents as well as the different usages of *Yuan baihua* by various groups of people within the same document, he notices that *Yuan baihua* appears to have varying degrees of Mongolian influence depending on the status of the

speakers. That is, there are more Mongolian characteristics preserved in the *Yuan baihua* of the nobles than in the speech of the non-noble classes. He believes that "only the *Mengshi Hanyu* 蒙式汉语 'Mongolian Chinese' used by the nobles may present Pidgin language features, and there is lack of evidence to claim that *Yuan baihua* was the language used in everyday communication" (Cao and Chen 2009:120). Cao points out that the linguistic features in *Yuan baihua* in general reflect the different degrees of acquisition of the Chinese language by the Mongols. In other words, the errors in *Yuan baihua* are interlanguage errors (Cao and Chen 2009).

15.4 MECHANISMS, MODES, AND RESULTS OF CONTACT AND CHANGE IN THE CHINESE LANGUAGE

Over the past five years, Cao and Yu have given much attention to the mechanisms, modes, and results of language contact and how contact induced-changes have influenced the development of the Chinese language.

Cao and Yu (2007) divide the new phenomena found in the translated sutras into two categories—borrowing and interference. Borrowing refers to linguistic features of other languages that are superadded onto Chinese, while interference involves changes in grammatical development induced by other languages. The linguistic result of the two types of influence in language contact is different in Chinese. They point out that despite a good number of unusual linguistic features introduced through language contact in Chinese texts as mentioned previously, only a very few influenced Chinese grammatical development. The two most known cases where contact-induced features have triggered important changes in Chinese and are incorporated into the Chinese language system in modern days are the postverbal *yi* denoting the completion of an action in "V O *yi*" construction and the disposal construction. (See the following for discussion of the two cases.)

Cao and Yu propose that there are three basic modes whereby awkward and unauthentic linguistic features were brought into the Chinese language by Central Asian monks or Mongolian speakers. They are: expansion, restructuring, and substitution (Cao and Yu 2010; Yu 2013).

15.4.1 Expansion

There are two forms of expansion in the Chinese language contact situations. First, expansion may be seen in the higher frequency of an existing construction in Chinese. For example, it has been widely acknowledged among scholars that the frequency of

passive construction in the Chinese of translated Buddhist sutras is noticeably higher than that in Chinese texts of the Medieval Period. (See, for example, Wu 1983 and Zhu 1993.) The passive construction in Chinese, like many East Asian languages such as Japanese, Vietnamese, and Thai, primarily denotes adversity. The use of the passive voice in Sanskrit is different. It can be used in sentences with transitive verbs like English. It can also be used in the so-called impersonal construction, in which the verb is intransitive. It is apparent that Sanskrit has strong preference for the use of passive sentence in Sanskrit scripture. This may explain why there is a significantly higher frequency of passive sentences in the Chinese sutras. Second, expansion may be seen when linguistic rules are overgeneralized and language learners extend the application of a rule in their own language to the target language (TL). The postverbal *yi* denoting a completed action is a good example.

Since the late 1970s, linguists have noticed the usage of *yi* in the translated sutras, suggesting this could be related to the influence of the Sanskrit language in the original Buddhist sutras. Important studies include Hung-Nin Cheung (1977), Christoph Harbsmeier (He Moye) (1989), Zhu Qingzhi (1993), Seishi Karashima (1998, 2000), and Jiang (2008).

Translated Buddhist texts contain many examples of “V (O) + *yi* 已” construction. In pre-Qin times and the Eastern Han Dynasty, the verb in this construction could only be a continuous verb (*chixu dongci* 持续动词, e.g., *shi* 食 ‘to eat’), such as *shi yi* ‘have eaten’. In cases where the verb is an instantaneous verb (*shunjian dongci* 瞬间动词, e.g., *si* 死 ‘to die’), the expression *yi* that indicates something has come to an end is placed before the verb, such as *yi si* ‘[already] died’. In the translated sutras, however, the constraints on the verbs in Chinese is not observed. The translators use both groups of verbs in this construction without recognizing the fact that placing this second type of verb in the preexisting Chinese construction violates the grammatical rule. The use of *yi* with an instantaneous verb is a contact-induced result. This new form of “V (O) + *yi*” construction is first found to be used very frequently in the Buddhist sutras only, which means the new phenomenon was not accepted in the Chinese linguistic system between the late Han and Wei-Jin periods (i.e., between the third and sixth centuries). Not until during the Tang Dynasty (618–907) did the new verb member (instantaneous verbs) in the “V O *yi*” construction become frequently used as found in *bianwen* and in the writings of Chinese literary men. The *yi* was later gradually replaced by another perfective verb *liao* and in late Tang, the perfective verb *liao* developed into a perfective aspect marker, the modern Chinese *le*.

15.4.2 Restructuring

Restructuring is one of the strategies used by second-language learners in learning a TL. This strategy is that learners “maintain distinctions and other patterns from the learners’ native language (their first language) in constructing their version of TL grammar, by projecting first-language structure onto TL forms (Thomason 2001:147).” A good

example of restructuring can be seen in the emergence of the disposal construction (the *ba* construction).

The disposal construction is probably the most researched construction in all of Chinese diachronic syntax. The disposal construction can be divided into two groups: the narrow disposal construction and the broad disposal construction. The narrow disposal construction takes only one object, as in *Ba fan chile* 把饭吃了 ‘Finish the food’. Cao and Yu were the first to demonstrate that the earliest form to be used as an object marker was *qu* 取 as in “*Qu* 取 OV”. The word *qu* is derived from a verb meaning ‘take’, or ‘grab’ and not from *jiang* 将, *chi* 持, or *ba* 把 as proposed by previous linguists.

The disposal construction is developed from *liandongshi* 连动式 ‘serial verb construction (V1O1V2O2)’ a preexisting Chinese structure. This is a construction commonly seen in documents during and after the Han Dynasty. Between the Han and Tang, this construction underwent a series of developments and changes: when O1 = O2, the repeated object can be omitted. This time period happens to be the period when sutras were translated into Chinese from Sanskrit. The translators, due to the influence of Sanskrit SOV word order, omitted O2 and produced the new grammatical form of V1O1V2. In the cases where the full meaning of V1 was bleached or grammaticalized, this new form developed into the disposal construction. For example:

QU OV

是 时 目连 即 前 捉 手 将 至 门 外，
Shi shi Mulian ji qian zhuo shou jiang zhi men wai

That time NAME immediately go-forward hold hand take arrive door outside.

还 取 门 闭， 前 白 佛 言： 不 净 比丘，
huan qu men bi qian bai fo yan bu jing biqiu
return QU door close go-forward tell Buddha say NEG. clean monk
已 将 在 外。
yi jiang zai wai
already take put-to outside.

‘At that time, Mojinlin immediately moved forward grabbing [that person’s] hands and took him outside. Upon returning [he] closed the door, went forward and told the Buddha saying, “[I] took the unclean bhiksha outside.”’

Zengyi Ahanjing 增壹阿含经 (The Ekottara Āgama, ‘Numbered Discourses’ 44)

Qu O (Adv) V (Complement)

诸 人 民 取 苦 枉 杀， 然 父 王 自 与 我 愿，
Zhu renmin qu wu wang sha ran fu wang zi yu wo yuan
All people QU me injustice kill however father king himself grant me wish

我 今 受 死 亦 不 敢 辞。

Wo jin shou si yi bu gan ci

I now receive death also NEG. dare decline

‘... you people sentenced me to death with injustice, however [since my] father, the king, himself had granted me my wish, [even] I now will receive death, I don’t dare avoid it!’

Zengyi Ahanjing (The Ekottara Agama, ‘Numbered Discourses’ 31)

Cao and Yu propose that in the late Han period, this structure may have been influenced by Sanskrit or Pali translations before spreading to all registers of the Chinese language. This was the influence of Sanskrit or Pali on the birth of this typically Chinese structure (Cao and Yu 2000a, 2000b).

15.4.3 Substitution/Replacement

Substitution is another strategy that second-language learners adopt. This is similar to what Thomason (2001:147) called ‘a gap-filling approach—using material from the native language, while speaking the TL, to plug the holes in knowledge of the TL.’

Substitution/replacement cases can be divided into two types. The first type involves directly ‘transplanting’ unusual linguistic components into Chinese sentences. Unprecedented in the Chinese language, this newly emerged component thus violated Chinese grammatical rules. The cases where Chinese locatives are used as case markers in *Yuan baihua* belong to this type. The second type involves second-language learners’ inserting grammatical elements of their own language into Chinese sentences and coining a mixed construction of both languages. The special usage of the Chinese interrogative word *yinhe* 云何 ‘how’ is of the second type. In the translated Buddhist sutras, some of the interrogative sentences have a superfluous *yinhe* placed at the beginning of the sentence without any function as an interrogative. This interrogative word is used to translate the Sanskrit word *kim* ‘what’ in Chinese sutras. This rather awkward and redundant *yinhe* is due to the external influence through the medium of borrowing.

Most of the contact-induced unusual linguistic features have resulted from substitution or replacement. Of the fifteen examples of contact-induced ungrammatical features given in Section 15.2, eight of them belong to this mode, including examples (c) through (g). Examples from translated Buddhist sutras are: (c) copular construction—‘subject, noun *shi*’ construction; (d) the special usage of the interrogative word *yinhe*; (e) the cause marker *gu* used at the end of sentences; (f) the genitive marker *suo/xu*. Examples from *Yuan baihua* are: (c) the postpositioned object case marker *gendi*; (d) the suffixes encoding causative *shang/shangtou*; (f) the special use of *you* in the end of a sentence; (g) the particle indicating direct quotation *modao*. These ungrammatical features were either transplanted into or superimposed onto the Chinese language. None of them was acceptable in the original Chinese system, and they never appeared in the writings by Chinese people.

In the expansion mode and restructuring mode, not all of the contact-induced atypical features were accepted into the Chinese language system. For example, the words indicating ‘plurality’ of people in Old and Middle Chinese were *deng*, *bei*, and *cao*. After the Northern Song Dynasty (960–1126), *mei* 每 (or *men*) replaced the above forms as a plural marker for people. In *Yuan baihua*, however, the use of *mei* is expanded beyond the marking of people to include animate nouns, such as *mamei* 马每 ‘horses’, *ying-goumei* 鹰狗每 ‘eagles and [hunting] dogs’, and even to inanimate nouns such as *caodime* 草地每 ‘grass’, *chaitanmei* 柴炭每 ‘firewood-charcoal’. The expansion of *mei* is associated with the language contact with the Mongols. But the new usages of the plural marker are only found in *Yuan baihua*, and it became extinct after the Mongols lost their power to Chinese. This is an example where Chinese grammar was blurred by the errors of non-Chinese speakers, and yet they did not leave permanent marks on the Chinese language system.

15.5 FURTHER STUDIES IN THE FIELD

Have the large scale of language contacts in the Chinese language history influenced the development of the Chinese language? We suggest that it is necessary to examine the various language contact situations through synchronic and diachronic lenses to have a fuller understanding. The focus in synchronic study may include topics such as which new, special, and unusual linguistic features emerged in the Chinese language, the approximate time of their appearance in the written texts, and how these new features emerged and were used within the language of that particular period. The main focus in diachronic study is to trace which features were accepted in Chinese, what triggered grammatical changes in later periods, what became extinct, and, most important, what externally emerged ungrammatical features came to be accepted in Chinese language system in the end. We also emphasize that researchers must have a good understanding of the social and cultural/religious backgrounds of that period, since the contact situations during these three periods are very different in terms of contact intensity, language policies, and other sociopolitical factors. As a result, these three different occasions of contact have left different marks on the development of the Chinese language.

Throughout Chinese history, China has had contacts with a number of non-Han ethnic groups whose languages belong to various language families. From the two large-scale language contacts that researchers have studied thus far, even though there are a good number of unusual unauthentic linguistic features found in both translated Chinese Buddhist sutras and *Yuan baihua*, there are only very few features that triggered grammatical change in Chinese and finally were incorporated as parts of the language system. Among the three modes of emergence of new grammatical features, the basis of expansion and restructuring is native Chinese language structures. The perfective *yi*, for example, merged into the Chinese language, but the appearance of instantaneous verbs, such as *si* ‘to die’, in the verb position does not break the structural frame of the Chinese

language. It has only blurred the original constraining rule of "V O *yi*" construction where the verb can only be continuous verbs such as *shi* 'to eat' as discussed in Section 15.4. A somewhat parallel situation is in the disposal construction. Chinese is an SVO language. If the serial verb construction did not undergo changes, the new formation of the disposal construction probably would not have become one of the most important grammatical constructions in Chinese language. Substituting/replacement is a mode in which foreign language elements were "forced" into the Chinese language. These elements are completely different from Chinese and have never existed in the native Chinese syntactic system. From the extant documents, we can see that these features are short-lived in certain written texts, never came to be accepted by Chinese people, and thus had no impact on the Chinese language development.

Over the past decade, researchers have gained some understanding about which linguistic features in the translated Chinese Buddhist sutras and the documents and texts still remain unanswered, however. For instance, is the language in *Yuan baihua* a pidgin or creole, or rather better described as marked with interlanguage errors made by Mongols learning Chinese? How does one ascertain whether a newly emergent linguistic feature is due to an external factor versus an internal factor, or rather both (contact triggering a process involving internal elements)? Typologically, the Chinese language is distinct from Sanskrit or Pali and the Altaic languages. It has been widely accepted that anything can be adopted from one language into another. But why is it that only certain special, atypical, "foreign" linguistic features appear in the Chinese written materials while others fail to? Researchers, based on the texts they have studied, have proposed theories to explain why certain special features emerged in the written texts and then quickly became extinct within a short period of time, while other features like the *ba* construction were sustained for more than 1,000 years to eventually become integral parts of the Chinese language. But systematic studies of language contact situations and their syntactic analyses have just begun. There are vast amount of materials from the late Han to the Qing Dynasty available for more profound studies on language contact in China. These studies should provide us with a clearer picture of language contact and its influence on the development of the Chinese language. Once we have a more complete understanding of it, we will be able to compare the Chinese cases and results with the case studies of language contact in other languages.

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CHAPTER 16

LANGUAGE CONTACT BETWEEN CHINESE AND JAPANESE

*Peculiarity of Japanese
in the Manner of Accepting Chinese*

MITSUAKI ENDO

CURRENTLY, Japan is the only country that uses Chinese characters in daily life outside China. Because of the use of *Hiragana* 平假名 and *Katakana* 片假名, the Japanese script is the most complicated in the world. For example:

| | | | | | | | | | |
|--------------------|-----------|-------------|----------------|--------------|--------------|----------|--------------------|----------|--------|
| 日本 | は | 縄文 | 時代 | (約 | 1 | 万 | 6, | 5 | 00 |
| Nihon-wa | | Jōmon jidai | yaku ichi | man | | roku sen | | go hyaku | |
| Japan-topic | Jomon era | about one | ten thousand | six thousand | five hundred | | | | |
| 年 | 前 | から | 約 | 3, | 000 | 年 | 前) | に | 既に |
| nen | mae | kara | yaku | san | zen | nen | mae | ni | sudeni |
| years ago | from | about | three thousand | years ago | in | already | unique-subordinate | | |
| 文化を | | 具えて | いた。 | | | | | | |
| bunka-o | | sonaete | ita. | | | | | | |
| culture-accusative | possess- | past | | | | | | | |

Japan had already its own culture in the Jomon Era (c.16,500-3,000 years before present).¹

As seen here, Chinese characters have multiple readings, with 文 read as *mon* and *bun*; the former is the Go-on 呉音 reading while the later is the Kan-on 漢音 reading. Moreover, there are *kun-yomi* 訓読み (native readings of Japanese words that have

equivalent meanings); in this case 彡 can be read as *fumi* (a letter) or *aya* (figure). In the previous example, 既 and 具 are read as *sude* and *sona*, respectively. These two characters have *ki* and *gu* as Sino-Japanese readings, respectively. Almost all Chinese characters in Japanese have more than three readings systematically.

In contrast, all Chinese dialects except for Min, as well as Sino-Korean and Sino-Vietnamese, generally have only one reading for one Chinese character. Hence, such multiplicity is a striking phenomenon of Sino-Japanese. According to Kōno (1976:539), this resulted from a long tradition in which the Japanese embraced a foreign culture and its language at different times.

Typologically speaking, Japanese is an Altaic-type language with an agglutinative SOV language having a CV syllable structure. As compared to Mongolian, a language that has very few Chinese loanwords in spite of a much closer and historically longer relationship with China, Japanese demonstrates abundant loanwords from Chinese and from English in more recent times. As a result of Chinese influence, Japanese syllable structure was remarkably altered. For example, the medial *-i-* of Chinese entered Japanese, as in *jō* 縄, which goes back to *jian*, as well as the medial *-u-*, as in *ka* 化, which originated from *kwa*; however, the medial *-w-* has recently disappeared. Syllables with a final *-n*, as seen in *hon* 本, *man* 万, and so on were also introduced into Japanese. On the other hand, syllables ending in *-p*, *-t*, *-k* were accepted with paragogic vowels, as in *it-i* 一, *rok-u* 六, *hyak-u* 百. *-t* was pronounced without the paragogic vowel at the beginning of Japanese history. Similar to the Altaic languages as well as Korean, *r* does not occur in the initial position in native Japanese words; however, it does occur in the borrowed words from Chinese, as in *rok-u* 六. Syllables with voiced consonant onsets also occur in Chinese loanwords, as seen in *jidai* 時代, *dokujū* 独白, *bunka* 文化, and others, but they rarely occur in native Japanese words.

Words of Chinese origin amount to about half of the contemporary Japanese lexicon, while the grammar of Japanese is almost untouched by the contact with Chinese, probably due to the unique situation in which there was no large-scale contact between the two spoken languages as Japan is an archipelago located considerably far from the continent and travel risks had prevented direct contact between the two spoken languages. Limited numbers of intellectuals learned classical Chinese as a written language, and only a few Japanese acquired spoken Chinese ability in the premodern period. This situation is similar to that of Europeans learning classical Greek and Latin but not as a live language.

16.1 THE TRANSMISSION OF CHINESE CHARACTERS AND LANGUAGE TO JAPAN

The earliest physical evidence for the transmission of Chinese characters to Japan is a gold seal with the letters *Han Woninguo wang* 汉委奴国王, which was discovered in

1784 in Kyushu, Japan. According to the *Hou Han Shu* 后汉书, this was presumably a gift to the envoys of *Woguo* 倭国 from the Chinese Emperor *Guangwu* 光武 in 57 CE. Coins and bronze mirrors of Chinese origin dating from the 2nd century BCE to the 3rd century CE were also excavated from ancient tombs from around the 4th century CE, but all of the Chinese characters on them were written by the Chinese people. There were imitation mirrors made in Japan from about the 4th century CE, on which Chinese characters were changed into geometric patterns, indicating that Japanese people were still unable to read Chinese characters during this period.

According to Japan's oldest historical record, the *Kojiki* 古事記 (712 CE), the king of *Paekche* 百济 sent the teacher *Waniki* 和邇吉 to Japan during the reign of the Emperor *Ojin* 應神, and he brought *Lunyu* 论语 and *Qianziwen* 千字文 to Japan. The *Nihonshoki* 日本書紀 (720 CE) refers to him as *Wani* 王仁 and specified his exact arrival date as the 16th year of the *Ojin* period (285 CE). A contradiction about the date has been pointed out, because *Qianziwen* was compiled by *Zhou Xingsi* 周兴嗣 (470–521 CE). However, the chronology before late 6th century in *Kojiki* and *Nihonshoki* was lengthened artificially. Hence, the absolute dating of *Ojin* period must be around the 6th century. In any case, this legend includes at least two important facts: first, that Chinese language was transmitted to Japan by the *Paekche* people; second, the Confucian classics and a textbook for literary language were of great importance.

Karlgren's (1926) chapter 6 enumerated some twenty Japanese words that he thought were borrowed from Chinese before the Sui and Tang Dynasties (e.g. *ipe* 邑, *sato* 宅, *tsuku* 築, *saku* 析, *take* 竹, *sugi* 杉, and so on). Karnei (1954) examined these examples meticulously and rejected Karlgren's claims, except for *kuni* 郡, *kinu* 絹, *uma* 馬, and *ume* 梅 which he treated as more admissible and probable cases of early borrowings.

16.2 SUIKO PERIOD INSCRIPTIONS

The *Suiko* 推古 period (592–628 CE) corresponds to the reign of the first empress in the history of Japan. From 600 to 618 CE, Japan sent envoys 遣隋使 to the Sui Dynasty five times. There are a series of inscriptions from this period called the *Suiko-chō ibun* 推古朝遺文, in which Japanese proper names are rendered by Chinese characters. Oya (1911) collected all specimens and added annotations. He pointed out that these transcriptions reflected characteristics of Old Chinese. Some examples from Rai (1983:311–314) are listed in the following (ō, ē, i denote the so-called B series vowels of the Ancient Japanese, of which phonetic values are controversial):

(1) Examples that reflect the differences of Old Chinese rhyme groups:

| | |
|----|--|
| 之部 | o 意, kō 己, tō 止, yō 已, rō 里 |
| 歌部 | ka 奇, ga 宜, ya 移, ta 侈, ga 義 |
| 支部 | ki, ke 支, ki 岐, pe 俾, si 斯, ti 知, ti 智 |

脂部 pi 比, i 伊, i 夷, ti 至, ti 遲, ri 利, zi 白, mi, me 彌
 pi 悲
 微部 pi 非, mī 未, kī, kē 夬, kē 希

(2) Two Old Chinese sources for the palatal consonants of Middle Chinese: originated from dentals of Old Chinese ㄊ, ㄊ, ㄊ, ta 侈, tu 川, tiku 職 originated from velars of Old Chinese kī, ke 支, ke or ki 旨

The same transcription system is seen on the recently excavated sword of *Haruyama* 稻荷山, dated 471 CE, as well as on the *Shichishitō* 七支刀, dedicated from *Paekche* and the other materials of this period. Why were various properties of Old Chinese phonology retained in these materials, even though the *Suiko* era is exactly contemporary with the Middle Chinese rhyme book *Qieyun* 切韻? The same tendency is seen in *Paekche* materials included in *Nihonshoki* (720 CE) as well as in the *Koguryō* 高句麗 transcription (see, e.g., Beckwith 2007). The peculiarity of the *Suiko-chō ibun*, which is also called *Kokanon* 古韓音 'Old Korean sounds', is due to the fact that the sound system was imported via Korea, where Old Chinese vestiges were preserved even into the Middle Chinese era.

16.2.1 *Kojiki* and *Go-on*

During the *Nara* period (710–794 CE), two important materials, the *Kojiki* and *Nihonshoki*, were compiled. *Kojiki* was written with the so-called *Hentai Kanbun* 変体漢文 'irregular style classical Chinese written by Japanese'. The first passages are provided as examples in the following (Kurano and Takeda 1958):

天地初發之時，於高天原成神名，天之御中主神訓高下天云阿麻。下效此。...
 Ametsuchi hajimete hirakeshi toki, takama no hara ni nareru kami no na wa, Ame-no-mi-naka-nushi-no-kami...

'When the heaven and the earth began for the first time, the names of those who became gods in Takama-no-hara are Amenominakanushi-no-kami....'
 次國稚如浮脂而，久羅下那州多陀用弊流之時，流字以上十字以音。...

Tsugini kuni wakaku ukishi abura no gotokushite, kurage nasu tadayoeru toki, ...
 '... Afterward, when the country was young and like floating grease, drifting as if it was a jelly fish...'

Though written in Chinese, there are several irregularities. First, the word order of the preposition phrase 於高天原 is before the verbal phrase 成神. Second, according to the commentary, 天 in 高天原 'heaven' has two morphemes in Japanese: *ame* as a free

morpheme and *ama* as a bound morpheme. The 天 in this proper noun should therefore be read as *ama*. This means that sentences of the whole text were written in Japanese but rendered with Chinese characters. Such use of Chinese characters is called *kankana* 訓仮名, which represents Japanese words with Chinese words of similar meaning. Third, 而 is used at the end of a phrase, which contradicts classical Chinese grammar. It is only understandable as a conjunctive form of Japanese. Fourth, 久羅下, 那州, and 多陀用 弊流 are syllable-by-syllable transcriptions of the Japanese words *kurage* 'jerry fish', *nasu* 'jūke', and *tadayoeru* 'floating'. Such use of Chinese characters is called *onkana* 音仮名, which represents Japanese words with Chinese words bearing similar pronunciations. *Kankana* and *onkana* are two main forms of the *Manyōgana* 萬葉仮名 writing system, which is named after the famous anthology of Japanese ancient poetry *Manyōshū* 萬葉集 (about 759 CE).

There is a mixed-nature rendering method in the *Kojiki*, known as *senmyōgaki* 宣命書, as demonstrated by *ari-keri* 在祁理, in which 在 is *kankana* and 祁理 is *onkana*. Here, the verb stem was written in *kankana*, while the conjugative suffix was written using *onkana*. The *senmyō* were imperial mandates, which required precise record-keeping, and so the suffixes were added to be explicit.

There are plenty of Japanese poems written using *onkana* in the *Kojiki*. Their phonological system corresponds to *Go-on* 吳音. It is conceivable from the previous examples that *cizhuo* 次浊 initials (nasal and lateral) are used for nasal onsets, as in *ma* 麻 and *na* 那, while *quanzhuo* 全浊 initials were used for voiced onsets, as in *ge* 下, *da* 陀.

16.2.2 *Nihonshoki* and *Kan-on*

The *Nihonshoki* (abbreviated as *NS* below) appeared just eight years after the *Kojiki*, but the style is totally different. It is generally written in orthodox classical Chinese but mixed with Japanese-style influences in some places. The *Nihonshoki* follows the chronicle style of Chinese official histories. The following are some passages from the beginning of the text:

古天地未剖，陰陽不分，渾沌如雞子，溟涬而含牙。

Japanese songs are rendered by the other sets of Chinese characters:

yakumo fatu idumo yapegaki tumagōmēni yapegaki tukuru sōnō yapegakiwo
Kojiki 夜久毛多都 伊豆毛夜幣賀岐 都麻暮微爾 夜幣賀岐 都久流 曾能夜幣賀岐哀
NS 夜句茂多菟 伊弩毛夜霸餞岐 菟磨語味爾 夜霸餞岐 菟俱盧 贈迺夜霸餞岐廻

Here we can clearly see that the *Go-on* phonological system has been replaced with the *Kan-on* phonological system. 久 and 流 are read *ku*, *ru* in *Go-on*, respectively, but they are *kiu*, *riu* in *Kan-on* and thus replaced by 俱盧. For Japanese *du*, *ga*, and *go*, the *Kojiki* used

quanzhuo 豆賀基, while the *Nihonshoki* replaced them by *cizhuo* 弩餓語. This reflects the denasalization of nasals that occurred in the *Changan* 长安 dialect of the Tang Dynasty. Maspero (1920) pointed out this change might be evidenced in a transcription of Sanskrit by *Amoghavajra* (705–774), dating from the 8th century. To be more precise, Japanese voiced consonants were prenasalized during this period; moreover the phonetic values of Chinese *cizhuo* initials after denasalization were mb-, nd-, ng-, and so on, and so they bore appropriate phonetic values to render Japanese voiced onsets. Another striking characteristic of the *Nihonshoki* is the tendency to select rare characters intentionally. This situation is similar to that of *dharani* in the Chinese translation of Buddhist sutras and was done in order to discriminate between sound transcription and text.

The *Nihonshoki* relied on various source materials and was compiled by many authors. According to Mori (1991), it is divided into two groups (α and β), according to the phonological system used to transcribe Japanese songs. The α group is of a more homogeneous nature; hence Mori assumed that it was refined by the Chinese compilers *Shoku Shugen* 続守言 and *Satsu Kokaku* 薩弘恪 who were the “Erudites of Sounds” 音博士 in the national school 大学寮.

On the other hand, there are quotations from Paekche materials similar in nature to the Suiko period inscriptions (Kinoshita 1961, 1993). The *Nihonshoki* contains some vernacular Chinese words of the Tang Dynasty as well (Tang 2009). Sino-Japanese vocabulary in general reflects the old meanings of Middle Chinese; for example 湯 *yu* or 火 means ‘hot water’ in Japanese, a meaning that in Modern Chinese only survives in proverbs such as 赴汤蹈火 (go-hot water-dance-fire) ‘no matter how hard’.

16.3 JAPANESE ENVOYS AND MONKS WHO TRAVELED TO TANG CHINA AND THEIR ACHIEVEMENTS

From 630 to 838 CE, Japan sent envoys 遣唐使 to the Tang Dynasty about twenty times in order to bring back the advanced civilization of the Tang, particularly Buddhism. The Japanese envoys exchanged the gifts in gold from the emperors of China for large numbers of books. In this way, many documents of Confucian classics and Buddhist sutras were brought to Japan. The tradition on *Siddham* 悉曇 was then imported. *Siddham* refers to a form of Indian paleography with religious meaning for each Indian letter. To spell and read mantras or Buddhist formulae correctly was extremely important for esoteric Buddhist ideas, and so monks stressed the importance of phonetic precision. *Shitanzō* 悉曇藏 (880) by *Annen* 安然 is one of the masterpieces in this field and includes a number of important examples and descriptions of Chinese phonology from the period. The following is a passage discussing the origin of the names *Go-on* and *Kan-on*:

承和 (834–848) 之末正法師來。... 元慶 (877–885) 之初聽法師來。... 此兩法師共說吳音、漢音。且如摩字、那字、泥字、若字、玄字、迴字等類，吳似和音，漢如正音。

‘The monk *Yuishō* 惟正 came at the end of the *Jōwa* period. The monk *Chisō* 智聰 came at the beginning of the *Gangyō* period. Both of these two monks explained the *Wu* accent and the *Han* accent. As for 摩, 那, 泥, 若 (i.e., nasals), 玄, 迴 (voiced onsets), etc., the *Wu* accent is similar to *Waon* (i.e., Japanese pronunciation), while the *Han* accent is like *Seion* (the standard pronunciation).’

The passage shows that the reflection of nasals and voiced initials differed between the *Wu* region and the *Changan* (*Han*) region, in the *Wu* region (as well as in the older layer of Sino-Japanese, or *Waon*), nasals were pronounced as actual nasal sounds and voiced onsets preserved real voiced values, whereas in the *Changan* region (as well as in the newer layer of Sino-Japanese, or *Seion*), nasals were denasalized and voiced onsets had devoiced.

The passage shows that the original terms for *Go-on* and *Kan-on* were *Waon* and *Seion*, respectively. Moreover, the names for *Go-on* and *Kan-on* were coined merely on the basis of their similarity to Chinese dialects in 9th century; thus *Go-on* did not necessarily originate from the *Wu* (*Go*) region of China.

During Nara (710–794 CE) and Heian (794–c.1185 CE) eras, Buddhist sutras were generally read using traditional *Go-on*, while Confucian classics were read using *Kan-on*. *Kūkai* 空海 brought the esoteric Buddhism taught by *Amoghavajra* 不空 from *Changan* to Japan and started the *Shingon* sect 真言宗. A *Tendai* 天台宗 monk named *Ennin* 圓仁 (794–864) also went to China and brought to Japan the practice of *shōmyō* 声明, a style of chanting of Buddhist hymns. The melody of the *shōmyō* reflects tone values of 9th-century *Changan* dialect, and its readings reflect a newer pronunciation of *Changan* dialect than that of *Kan-on*. For example, 命 is pronounced *myau* in *Go-on*, and *mei* in *Kan-on*. The initial *m-* is preserved in *Kan-on* because denasalization had not yet affected words bearing syllable-final nasals. In *Tendai Shōmyō*, the character is pronounced as *bei*, reflecting a more advanced stage of denasalization. Furthermore, final consonants in the entering tone 入声 syllables were also lost in some cases, as in 積 *seki* ~ *sei* and 十 *sipu* ~ *si*, etc. (Numoto 1984). This newer layer of *Changan* pronunciation is called *Shin Kan-on* 新漢音 ‘new *Kan-on*’.

16.4 THE END OF ENVOY TRAVELS TO THE TANG DYNASTY AND THE JAPANIZATION OF CHINESE LITERACY

Due to the unstable social situation at the end of the Tang Dynasty, Japan stopped sending envoys to China in 894. Afterward, a period of isolation began in the archipelago.

These changes generated two important effects: the fossilization of Chinese sounds and meanings and the "Japanization" of Chinese literacy. Regarding the fossilization of Chinese pronunciations and meaning, it is enough to point out here that Sino-Japanese of the Tang period have been remarkably well preserved, although they did undergo later changes that affected the entire Japanese phonological system.

The Japanization of the Chinese language happened from the early period. A series of grammatical and pragmatic mistakes are highlighted in official documents written in Chinese, such as the Seventeen-Article Constitution, as well as the *Nihonshoki*. For example, differences between 非 and 不, 有, and 在, as well as issues of word order and so on all appear (Mori 1999). Such mistakes are known as *washū* 和習 'Japanese style' and represent the kind of inevitable errors that occur when foreigners write in a non-native language.

We have already mentioned *kun-yomi* 訓読み, in which almost all Chinese characters are read using one or more corresponding Japanese words. This peculiarity isn't seen in Korea or in Vietnam, although the Chu Nom system of Vietnamese bears certain similarities. In addition to *kun-yomi*, Chinese classics were also read according to Japanese word order, adding Japanese particles after each Chinese word as if it were an agglutinative language. This method of reading Chinese language is called *kundoku* 訓読. Dots representing Japanese particles (called *kunten* 訓点) were also added to Chinese texts starting from the end of 8th century onward. After the 8th century, enormous numbers of Buddhist sutras as well as Chinese classics appear with *kunten*. These dots were usually added with red or white ink and even scratched with a thin stick called *kakuhitsu* 角筆 in some cases.

Almost at the same time, Japanese particles were written with abbreviated Chinese characters, for example, ㄚ (*a*) for 阿, ㄨ (*i*) for 伊, ㄨ (*u*) for 宇, and so on. This practice is the origin of *Katakana* 片仮名. *Kata* means 'one side', while *kana* is opposed to *mana* 真名 'real character' (e.g., Chinese characters) and thus it means 'provisional character'. Slightly later, *Hiragana* 平仮名 emerged from the cursive script 草書 of Chinese characters, for example, ㄨ (*a*) from 安, ㄨ (*i*) from 以, ㄨ (*u*) from 宇, and so on. These were called *wonade* をん な ㄨ (女手, 'female script') during the Heian period (794–1192). To exchange poems in Japanese was an important way to keep company between a nobleman and a noblewoman at the time, so *Hiragana* was used by writers to compose poems in Japanese, including many women. This system was employed to write the *Tale of Genji* 源氏物語, one of the earliest novels in the world and written before 1001 by female author *Murasaki Shikibu* 紫式部.

Around 1120, the *Konjaku Monogatari* 今昔物語集 was written in a mixed style of Chinese characters together with *Katakana*. This kind of style appeared earlier as *senmyōgaki*, in which Japanese particles were written with *Manyōgana*.

There is another mixed style known as *nonzenyōmi* 文選読み, demonstrated by the following: 天地玄黄 *tenchi no ametsuchi wa*, *gwenkwan* to *kuroku ki nari*. Here, *tenchi* and *gwenkwan* are Sino-Japanese readings for 天地 and 玄黄, respectively, while the rest are translations into Japanese. This style was used to read Chinese classics such as the *Wenxuan* 文選. Recently, discoveries of *Kyōgō* 口訣 (documents or commentary with Korean particles), as well as scratched commentary by 角筆 have been reported in

Korea. Some scholars have pointed out the possibility that *kundoku* and *Katakana* originated from the Korean people.

16.5 FROM THE SONG DYNASTY TO THE PRESENT

During the Song and Yuan Dynasties, there was trading between Japan and China, and Japanese monks of Zen Buddhism also traveled to China. They brought Zen materials and read them in a contemporary dialect of Chinese from *Zhejiang* area. A limited number of Chinese words from this period entered the Japanese vocabulary, such as *isu* 椅子, *manjūyū* 饅頭, and *oshō* 和尚. This layer of Sino-Japanese is called *Tō-on* 唐音, though its dating is later than the Tang Dynasty.

The *Edo* 江戸 government (1603–1868) continued the closed-door policy and restricted foreign traders to the *Nagasaki* 長崎 port only. From 1604 onward, Chinese interpreters or *Tōsūji* 唐通事 worked in *Nagasaki* as well as in *Ryūkyū* 琉球. They compiled a series of Chinese conversation texts based on the *Nanjing* 南京, *Hangzhou* 杭州, and *Fuzhou* 福州 dialects. A Chinese monk from *Hangzhou*, *Shintetsu* 心越 came to *Mito* 水戸 and transmitted contemporary *Hangzhou* readings together with Chinese zither tunes 琴曲, which reflect the tone values of the *Hangzhou* dialect.

Neo-Confucianism 朱子学 was the governmental school of the *Edo* era. Intellectuals read these vernacular texts and other Chinese vernacular literature along with the Chinese classics using *kundoku* methods. They composed official writings (including poems) in classical Chinese.

According to Miyajima (1967), the ratio of Chinese loanwords in Japanese vocabulary changed as shown in Table 16.1 (the sum of each document doesn't always equal to 100 because there are other kinds of words). Miyajima's analysis shows that the ratio of Chinese loanwords to native vocabulary increased rapidly at the beginning of Meiji era (1868–1912).

Table 16.1 Ratio of Chinese loanwords in Japanese vocabulary

| | Japanese original words (%) | Chinese borrowing words (%) |
|---|-----------------------------|-----------------------------|
| <i>Man'yōshū</i> (7th–8th century) | 100 | 0 |
| <i>The Tale of Genji</i> (c.11 century) | 94.2 | 5.2 |
| <i>Japanese-Portuguese Dictionary</i> (1603–1604) | 78.7 | 20.5 |
| <i>Mō-ei Gorin Shōsei</i> (1867) | 73.9 | 25.0 |
| <i>Yubin Hochi</i> (1877–1888) | 63.9 | 34.7 |
| 13 magazines (1953–1954) | 58.7 | 38.5 |

More recently, words such as *chashū* 叉焼, *shūmai* 焼売, *wantan* 雲吞 (餛飩) were borrowed into Japanese. These are apparently of Cantonese origin, as indicated by their pronunciation.

16.6 JAPANESE LANGUAGE AS SEEN IN CHINESE DOCUMENTS

Descriptions of Japan in Chinese sources begin with the *Hou Han Shu* 后汉书 and include proper nouns of Japanese languages. During the Ming Dynasty, a series of descriptions of Japanese vocabulary rendered in Chinese characters was also completed (Ōtomo 1963).

During the 19th to 20th centuries, Chinese people translated Japanese translations of Western books. As a result, a certain number of new words coined by the Japanese but using Chinese characters were imported into the Chinese language (Lee 2010; Shen 2010).

After this period, Japanese influence on the Chinese language has been scant, except for some words such as *benrō* 便當 'lunch box' in varieties of Taiwan dialects, as well as 入文 and 超 (used as an adverb of degree) in current Taiwanese Mandarin, through which they have penetrated into the standard language in mainland China.

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CHAPTER 17

2,200 YEARS OF LANGUAGE
CONTACT BETWEEN KOREAN
AND CHINESE

IK - SANG EOM

17.1 INTRODUCTION

LANGUAGE contact between Chinese and Korean over the course of the past 2,200 years has been extensive and constant. Since Korea is geographically adjoining to China, there have been frequent contacts throughout the history. The Koreans relied on Chinese characters in writing until they invented their own writing system, Hangul, in 1443. Even after the Korean alphabet was officially promulgated in 1446 CE, the elite class still used Chinese characters until the 20th century, when they started using the mixed scripts comprising both Hangul and Chinese characters. The overwhelming tendency of exclusively using Hangul seen today began as late as the 1970s. A long history of Koreans using Chinese characters led to massive borrowing of Chinese words into the Korean lexicon. In the meantime, many Chinese vocabularies filled the empty slots in the Korean lexicon and even replaced some of the indigenous Korean vocabularies. Approximately 70% of the modern Korean lexicon is Chinese loanwords or Chinese-based words, coined by Koreans or Japanese.

Some Korean linguists believe that the language contact between Korean and Chinese is not as frequent as what has been assumed. Pak (1989:179–180), for instance, states that Sino-Korean (SK), Korean readings of Chinese characters, were never influenced by the subsequent changes of Chinese after they were borrowed into the Korean language. The traces of Old Chinese (OC) in Old SK were replaced by Middle Chinese (MC) of the Tang Dynasty after the unification of the peninsula by Silla 新罗 in 668 CE. Yi (1995:271) also states that SK underwent an independent path of evolution regardless of the changes in Chinese. Although it is true that Modern SK still preserves many characteristics of MC, that does not mean that there was no further contact between the

two languages in Early Mandarin (EM) and Modern Mandarin (MM). Accordingly, this chapter presents evidence of constant contact between the two languages from the earliest time to the present.

17.2 THE TRANSMISSION TIME OF
CHINESE CHARACTERS

It is generally believed that Chinese characters were transmitted to ancient Korea as early as the 1st century BCE. This conventional view is not based on linguistic evidence but on a historical fact. That is, the Han Empire established four commanderies in Old Choson 古朝鮮 in 108 BCE. Since these commanderies lasted for almost 500 years until 372 CE, there must have been a group of Chinese and Korean people who were able to communicate with each other. In fact, some relics of the time, such as family registers written on wood sticks, have been excavated. Nevertheless, massive language contact must have actually taken place even earlier than 108 BCE. Wei Man 卫满, a Yan 燕 Chinese, fled to Old Choson with 1,000 followers after a failed coup, taking over Old Choson in 194 BCE. Wei Man and his followers opened a new era: the so-called Wiman Choson 卫满朝鲜. Accordingly, by the 2nd century BCE, Chinese characters were already in use in Old Choson.

If one compares SK and Chinese pronunciations diachronically, one may speculate on the time when Chinese characters were first transmitted to ancient Korea. A diachronic comparison between SK and Chinese may help determine the time of formation. However, this method can provide only very rough information about the time of transmission, either the 2nd or 1st century BCE. This is because these 200 years belong to the OC period. Based on currently available OC resources, there is no way to pin down which century of OC the transmission of characters occurred. More important, the time of first transmission and that of formation are different in the case of SK.

In order to work out a more precise time, one must consider more parameters. If Chinese characters were transmitted to ancient Korea in the 2nd century BCE or even earlier, SK should have preserved more characteristics of OC. In reality, however, modern SK is more similar to MC than to OC. Why is this? It is related to the fact that Silla 新罗 unified the three kingdoms. According to Yi (1998:52, 102–103), Modern Korean was derived from the language of the Unified Silla. As Silla defeated Paekche 百济 in 663 CE and finally Koguryo 高句丽 in 668 CE, the language of Silla became the koine of the Korean language. Accordingly, one can assume that Sino-Silla Korean of the 7th century became the basis of Modern SK. Many attempts have been made to clarify the exact time of SK's formation. Some notable contributions to this line of research have been made by Karlgren (1926), Kono (1968), Pak (1971), Shen (2006), and Itô (2007). While Karlgren and Pak propose the same time of *Qieyun*, roughly the 6th to 7th century, others prefer the 8th to 9th century. Whether a precise dating is estimated to the 6th or the

9th century, the Chinese within this time span still belongs to MC. Thus it is not worth all the effort to determine which theory is the most plausible due to the short time span involved and possibly multiple layers of SK.

17.3 THE TRANSMISSION ROUTE OF CHINESE CHARACTERS

One may want to compare SK to the cognates in various Chinese dialects to investigate the transmission route of Chinese characters into ancient Korea. This method is based on the premise that Chinese dialects and SK have never undergone any changes since they were formed. The reality, however, is a language may undergo constant changes. That is also the reason why, to date, no satisfactory source dialect has been suggested for SK. Eom (1991a, 1991b) pointed out that the Southern Min dialects are the closest dialects to Sino-Paekche Korean (SPK). Considering Old Wu traces in Southern Min, as was suggested by Ting (1988), and Paekche's frequent contacts with the southern states in the Wu area, Eom (2014) proposes Old Wu as the source of SPK.¹

Identifying the most similar Chinese dialect to SK might be easier than identifying the source dialect of SK. Nevertheless, which one is the closest dialect remained a controversial issue until very recently. The Min, Yue, or Kejia dialects were often proposed as the most plausible candidates without conclusive evidence. Based on CCLang (Cheng 2004), a computer software that measures the affinity among Chinese dialects, Eom (2005b, 2008a, chapter 13) concludes that the Meixian dialect is the closest dialect to SK in terms of phonological affinity. Eom (2008a, chapter 14, 2011) further points out that the closest dialect to SK nouns is the Changsha dialect, followed by the Beijing, Taiyuan, Jinan, Nanchang, Hefei, Xian, Wuhan, Chengdu, and Shuangfeng dialects. Except for Nanchang and Shuangfeng, these cities are all Mandarin-speaking areas. Therefore, Mandarin is the dialect closest to the SK lexicon. What is interesting is that SK tends to be phonologically closer to southeastern dialects, such as Meixian, Xiamen, and Chaoshou, while it is lexically closer to Mandarin. Why is this so? Although it may look contradictory, it is understandable because such discrepancies were caused by the differences of speed in phonological and lexical changes, as sound change is more conservative than lexical change.

To identify the SK source dialect, it is necessary to understand the relationship between Koguryô, Paekche, and Silla. Since Koguryô was located in the northern part of the peninsula and Manchuria, it is not difficult to assume that it received northern pronunciations of Chinese. Due to Koguryô's blockage, direct contact with northern Chinese was somewhat limited to Paekche, which was located in southwestern part. Paekche had more opportunities to develop contact with the southern states of China and naturally received southeastern pronunciations of Chinese. According to Han (1995:38–40), Koguryô dispatched envoys 113 times to northern states but only

forty-seven times to southern states in China. Paekche, on the other hand, sent envoys to southern states thirty-three times but only five times to northern states. Silla, which was located in southeastern part, had to accept the northern Chinese through Koguryô because it was geographically in an isolated position from direct contact with China. Nevertheless, it was Silla that unified the country in the end. Subsequently, the language of Silla became the standard of the Unified Silla, the basis of current Korean. It is natural to assume that Sino-Silla Korean also became the basis of Modern SK. If this is so, the source of current SK must be northern Chinese. It is acceptable to seek a source in the Chang'an dialect, as proposed by Kôno (1968) and Itô (2007), and Zhongzhou dialects as proposed by Shen (2006). Less plausible is the language of *Qieyun*, proposed by Pak (1971), because *Qieyun* may not represent a northern dialect but an artificial language reflecting a variety of synchronic and diachronic dialects at the time of compilation.

17.4 CONTACT WITH OLD CHINESE

Eom's (1990) research on SPK was motivated by the intention to clarify the transmission date and route of Chinese to Paekche. A more serious work to present the traces of OC in Old SK was developed in Eom's (1991a) dissertation. He found that SPK maintained only one alveolar plosive in SPK. That is, neither palatalized nor retroflexed alveolar plosives were developed in SPK. Since this is an important characteristic of OC, Eom (1991a, 1997, 2001) concludes that SPK was derived from OC. The ground of his claim is the place names listed in the *Samguk sagi* (三國史記, 1145), the oldest extant Korean historical text. The *Samguk sagi* lists multiple names of a certain place, if available. This indicates that there existed more than one way to transliterate a place name in Chinese characters at that time. Different names of the same place must have been pronounced in the same way or, at least, in similar ways. The following are Paekche place names:

- (1) a. 真峴 = 貞峴 (真=章, 貞=端/知)
 b. 屈旨 = 屈直 (旨=章, 直=定/澄)

Since the second characters in (1a) are identical, the first characters are supposed to have sounded the same. It is the other way around in (1b). These examples indicate that there was no distinction between OC *zhang* 章 initials, the retroflexed or palatalized alveolar plosives, and the *duan* 端 initials, the alveolar plosives, in SPK. There are, of course, more examples of this sort, listed in the *Samguk sagi*.

In addition, some seemingly native Korean words turned out to be Chinese loan-words. Shang (1981) claims that the Korean word for 'wind', *param*, was derived from OC Pronunciation of *feng* 風. This sort of examples was further reported by Zheng (1983), Choe (1990), Oh (2005), and O (2008). Some of their examples are as follows:

| (2) | OC | Native Korean | Glossary |
|------|-------------------|-------------------|----------|
| a. 风 | *pǝm(李)*plums(郑张) | param | wind |
| b. 江 | *kruŋ(李方桂) | karam > kan | river |
| c. 街 | *kriŋ(李方桂) | kari | street |
| d. 卦 | *kwriŋs | kalda | hang |
| e. 蛙 | *ʔwriŋ | (ke)guri/(me)guri | frog |
| f. 画 | *gwreegs | kurida | draw |
| g. 器 | *khrwds | kurus | bowl |

Eom also paid attention to the OC traces in SK and seemingly native Korean words. Eom (1999) claims that SK *ta* 茶 for 'tea' and *kim* 金 for 'gold' are also OC traces. The native Korean word for 'leaf', *ip* was also derived from OC of *ye* 叶. In addition, Eom (2007, 2012) reports more OC loan words among seemingly native Korean words, such as *nól* 'you', and *na* 吾 'I'. Eom (2008a, 2008b), for instance, claims that the Korean words for 'daytime', *nal*, and 'day', *nal* were derived from OC reading of the character *ri* 日 'sun'. The conventional view on the origins of *nal* and *nal* was that they were derived from the Mongolian word for 'sun', *narun*.

| (3) | OC | SK | Native Korean | Glossary |
|------|----------------|---------|---------------|---------------|
| a. H | *ñiet | il | nat/nal | day, sun |
| b. 尔 | *ñiei | i | na | you |
| c. 吾 | *ŋa | o | na | I |
| d. 茶 | *dea | ta/ʔh'a | - | tea |
| e. 金 | *kiam/*k(r)jim | klm/klm | - | gold, surname |
| f. 叶 | *Yiap > jiep | jap | ip | leaf |

All of these examples suggest that Chinese characters were transmitted to ancient Korea during the period of OC. This does not mean that the formation time of current SK was OC but the transmission time of Chinese characters was OC.

17.5 CONTACT WITH MIDDLE CHINESE

The most frequent contact between the two languages took place during the MC period. MC refers to the Chinese language from the 3rd to the 10th century CE. The Silla-Tang allied forces defeated Peckche in 663 CE and Koguryô in 668 CE. Without effective communication between Silla and Tang soldiers, it would not be possible to carry out the military missions successfully. After unification, Silla enhanced its contacts with Tang. A number of monks and aristocrats went to Chang'an to study. Due to these reasons, SK

underwent drastic changes and replaced the earlier layer of OC with the newly prestigious dialect of MC. This change resulted in few traces of OC surviving in SK. Many SK words now still follow the *fanqie* of the rhyme books of the *Qieyan* system. The consonantal codas of the MC entering tone are well preserved in modern SK.² If *Guangyun* lists more than one pronunciation of a character, SK faithfully follows the readings. The following characters had two MC pronunciations, one in open syllable and the other in closed syllable:

| (4) | OC | > MC | > SK | Gloss | OC | > MC | > SK | Glossary | |
|-----|----|--------|---------|-------|---------|--------|---------|----------|---------|
| a. | 帅 | *Siwei | > Swi | > su | general | *Siwat | > Siwet | > sol | command |
| b. | 说 | *ciwet | > ciwei | > se | speech | *ciwat | > ciwet | > sal | speak |
| c. | 复 | *biu | > biau | > pu | again | *biuk | > biuk | > pok | recover |
| d. | 易 | *Yie | > jie | > i | easy | *Yiek | > jiek | > jek | change |
| e. | 识 | *tia | > tcia | > tci | mark | *ciak | > ciak | > cik | know |
| f. | 塞 | *sa | > s a i | > se | border | *sək | > sək | > sek | block |

Since such distinction was also made in OC, it may be interpreted as being a trace of OC as well. Nevertheless, (4b) SK *se* is an obvious trace of MC because it had no OC reading of open syllable. Among others, Pak (1971) points out the presence of the doublets or *chongniu* 重纽 and distinction between Divisions 1 and 2 in *xieshe* 蟹摄 as the SK ties with MC. Since it is easy to find many traces of MC in SK, we do not present further evidence here. Once SK was formed under the framework of MC, SK underwent less frequent changes than before.

17.6 CONTACT WITH EARLY MANDARIN

SK was not fully free from the influence of the later major changes in Chinese after MC. As MC changed to EM (from approximately the 10th to the 19th centuries), SK was influenced by EM in part. For instance, the MC voiced unaspirated initials in level tone were changed to voiceless aspirated initials in EM. The aspiration of the following characters, which are quoted from Eom (1999, 2008a, chapter 10), is believed to have been developed during that time. This change seems to have been implemented through Koryô's 高丽 contacts with the Yuan Dynasty, including several Mongol invasions.

| (5) | OC | > MC | > EM | > MM | SK | Examples | Glossary |
|-----|----|-------|-------|---------------------|--------------------|-----------------------|--------------------|
| a. | 婆 | *buai | > bua | > p ^h uo | > p ^h o | 婆婆 saba | world of suffering |
| | | | | | | 老婆 nop ^h a | old woman |
| b. | 皮 | *bhai | > bie | > p ^h ui | > p ^h i | 鹿皮 nokpi | deer skin |
| | | | | | | 毛皮 mop ^h i | fur |

- c. 便 *bian > bien > p^hien > p^hien pian/p^hien 方便 p^han 大便 te^hbian 方便 p^han 方便
 方便 p^han convenient
 d. 糖 *dan > dan > t^han > t^han tan/t^han 糖分 tan^hun 糖分 tan^hun 糖分 (content)
 砂糖 sat^han 砂糖 sat^han 砂糖 sat^han 砂糖 sat^han candy

17.7 CONTACT WITH MODERN MANDARIN

MM refers to the Chinese language since the beginning of the 20th century. Roughly speaking, the first half of the 20th century was the period when both Korea and China were politically unstable. The second half of the century was mainly the time when the two countries experienced the severance of the mutual relations. Since the diplomatic relations were established in 1992, the personal contacts between two countries increased rapidly. Korean students are the largest group of foreign students in China. Conversely, Chinese students are in the same situation in Korea. China has been Korea's largest trading partner since 2004. Korea ranks as China's third largest trade partner. This naturally led to frequent language contacts. Although there have been marginal sound changes in both Korean and Chinese in the past century, no significant MM influence is detectible in SK, or vice versa.³ Notable changes, however, are taking place in the lexicon now, as cross-linguistically language change tends to start in the lexicon first. Korean and MM are no exception. The following is from Eom (2008a:312–315), with some additions:

| (6) Word | Korean | Glossary | Word | Korean | Glossary |
|----------|---------------------|-----------------|------|------------|-----------------------|
| 深圳 | simtʃan | Shenzhen | 榨菜 | tʃasai | pickled mustard tuber |
| 哈尔滨 | haalbin | Harbin | 乌龙茶 | uronŋʃa | wulongtea |
| 游客 | jouk ^h a | tourist | 武术 | uʃju | martial arts |
| 八零后 | palinhou | born after 1980 | 九零后 | tʃiulinhou | born after 1990 |

17.8 CONCLUSION

This chapter demonstrates that Korean has had constant contact with Chinese since the Chinese characters were transmitted to ancient Korea at latest by the 2nd century BCE. The Chinese language underwent drastic changes from OC, MC, EM, to MM in the past two millennia. The OC-based Old SK was updated during the Tang Dynasty when MC became the basis of Modern SK. Different from what Pak (1989) and Yi (1995) observe, SK was influenced by EM as well.⁴

Sound change cannot be implemented only in one direction, as Wang and Lien (1993) point out. The same is true for language contact. Eom (2005a:333–335) points out

Piao 朴, a surname, as an example of Korean influence on Mandarin. Since almost no Chinese uses this character as a surname, it is easy to pronounce it *Pu*, as in *chunpu* 纯朴. The large Korean-Chinese community in China, however, influenced the Chinese to read it *Piao* when used as a surname. Since there was not a large Korean-Chinese community in Taiwan, people there still read this Korean surname *Pu* in exactly the way as it is read as a common noun.

What is notable is that Korean words are rapidly transmitted into Mandarin spoken by Chinese students and Korean Chinese living in Korea. Variants of the lexical items from the following list, quoted from Eom (2008a:29) conceivably will quickly gain momentum in the near future:

| (7) Korean Chinese | Standard Chinese | Glossary |
|--------------------|------------------|-------------------------|
| 经营学 | 管理学 | business administration |
| 大学院 | 研究生院 | graduate school |
| 案内 | 指南/问讯 | information |
| 特讲 | 专题演讲 | special lecture |
| 先辈 | 学长 | senior classmate |
| 后辈 | 学弟/学妹 | junior classmate |
| 写真 | 照片 | photo |
| 化妆室 | 洗手间 | restroom |
| 观光 | 旅游 | tour(ism) |
| 料理 | 菜 | cuisine/dish |
| 韩食 | 韩餐 | Korean cuisine |

Among these examples, *xiezhen* for portrait pictures, *huazhuangshi* for a restroom, *guangguang* for tourism, *liaochi* for cuisine, and *Hanshi* for Korean cuisine are now commonly used by the young people in China, even though the exact meanings of these words used in China may be slightly different from what they are in Korea. Since some of them are being used in Japanese as well, one may claim that they may not be Korean loanwords but Japanese loanwords. The transmission routes of these words may be through Hong Kong and/or Taiwan. However, these words are rapidly spreading among the young people in China only in recent years. Since Japan normalized its diplomatic relation with China as early as 1972 but the spread of these words happened several decades later, there may be something else that is responsible for the transmission of these words into Chinese. Actually, Korean influence may explain the situation more reasonably. Since 1992, when Korea and China normalized their official relationship, the Korean films and TV series have suddenly become extremely popular among the Chinese people of all ages. Such a popularity, or the so-called Korean wave, has been playfully known in Chinese as *han-liu* 韩流 Korea-trend, a pun following an idiomatic Chinese expression *han-liu* 寒流 cold-stream “cold front.” The Korean wave over the

past decade, first in Asia and later all over the world, may have accelerated the cultural and language contact between China and Korea. Accordingly, it is quite possible that these words were transmitted into Mandarin lexicon via the Korean language, the carrier of the influential Korean popular culture. Given the number of Korean Chinese living in Korea now, more language contact phenomena like this can be expected in the near future.

NOTES

1. Paekche played a significant role in transmitting Chinese characters to ancient Japan. The early pronunciations of Sino-Japanese must be related to SPK, as was claimed by Eom (1990, 1991a,b, 1995).
2. The only exception is MC coda -l, which changed consistently to -l in SK. Although Martin (1997) claims that SK coda -l was derived from a northwestern dialect of the late Tang and Five Dynasties, Eom (2002) regards it as an internal change because the reduction of OC -t was already detectable in Old SK even before such tendency took place in the northwestern dialect of Tang China.
3. The length distinction in Korean vowels disappeared. The mid low front vowel [e] merged to [ɛ] in modern Korean. In MM, the syllable /ia/ disappeared. The low vowel in /yan/ was raised to [ɛ], while the high vowel in /au/ and /ung/ was lowered to [o].
4. SK underwent internal changes as well. SK and Mandarin took different paths of palatalization. For further information, see Eom (2003).

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CHAPTER 18

THE INFLUENCE OF
BUDDHIST SANSKRIT ON
CHINESE

XIANGDONG SHI

18.1 SANSKRIT INFLUENCE ON CHINESE
VOCABULARY AND FOLK LITERATURE

Buddhism came into China at the Eastern Han Dynasty (25–220 CE), but translation of Buddhist scriptures into Chinese did not begin until the end of the dynasty. The contact between Sanskrit and Chinese as a combined result of the arrival of Buddhism in China and the translation of Buddhist scriptures into Chinese introduced an unprecedentedly large number of Sanskrit words into Chinese. Initially the translation was mainly presided by foreign monks from *Yuezhi* 月氏 (an ancient Central Asian people), *Anxi* 安息 (Parthian or Arsacid Empire, a major political power in ancient Persia), *Kangju* 康居 (an ancient nomadic Central Asian people), and *Tianzhu* 天竺 (ancient India) living to the west of the Han Dynasty. But a few Chinese monks also participated, one of the most famous examples being the first documented Chinese monk Yan Fodiao 严佛调. After the Eastern Jin Dynasty, the number of Chinese monks participating in translation increased. Faxian 法显 (334–420), Xuanzang 玄奘 (600–664), and Yijing 义净 (635–713) were all among the eminent Buddhist translators. By the mid-Tang Dynasty (618–907), the number of Buddhist texts that had been written in, or translated into, Chinese amounted to 2,278, with a total of more than 7,000 volumes (see Zhisheng 1926–1931).

With the extensive translation of numerous Buddhist volumes into the Chinese language came the golden age of foreign loanwords. As is generally known, when a recipient language absorbs new objects and concepts from a donor language in contact situations, there are normally two approaches for rendering those words of foreign origin into the local language: literal or semantic translation and phonetic transliteration. Semantic

translation poses the least barrier for the recipients. However, as far as religious texts are concerned, a comprehensive semantic translation of the Buddhist scriptures is out of the question. Among many reasons, Xuanzang concluded five points, the so-called “Five Nos in Translation” (*wu bu fan*, 五不翻): no translation for mysteries, no translation for polysemy, no translation for objects or concepts that do not exist in this part of the world, no translation for what carries on the past heritage, no translation for words that arouse emotions” (Zhou 1926–1931).¹ Those that could not be translated literally had to be transliterated and became foreign loanwords:

Table 18.1 Phonetically transcribed Sanskrit words in Chinese

| Sanskrit | Chinese | Sanskrit | Chinese | Sanskrit | Chinese | Sanskrit | Chinese |
|----------|---------|------------|-------------|----------|---------|---------------|---------|
| fo | 佛 | pusa | 菩萨 | seṅg | 僧 | ni | 尼 |
| Buddha | 佛陀 | bodhisatva | bodhisattva | saṃgha | 僧伽 | bhikṣunt | 比丘尼 |
| Buddha | 佛陀 | bodhisatva | bodhisattva | monk | 僧 | nun | 尼姑 |
| | | | | | | cassock | 袈裟 |
| | | | | | | namo | 南无 |
| | | | | | | namo (<nāmas) | 南无 |
| | | | | | | namah | 南无 |
| | | | | | | nirvāna | 涅槃 |
| | | | | | | nirvana | 涅槃 |

These words carry such obvious religious overtones that even lay people can easily recognize their Sanskrit origin. In addition to transliterated Sanskrit words, semantically translated words also abound. Although these literally translated words are composed of morphemes of Chinese origin, they were combined to express new concepts that did not yet exist in the history of the Chinese language prior to the introduction of Buddhism. These words, illustrated in Table 18.2, can thus be traced to a Sanskrit origin as well.

Table 18.2 Semantically translated Sanskrit words in Chinese

| Chinese | Sanskrit | English |
|------------|--------------|---------------|
| shijie | loka-dhātu | world |
| zhongsheng | sattva | living beings |
| jushi | upāsaka | lay Buddhists |
| jieliu | vinaya | discipline |
| diyu | naraka | hell |
| yuanman | Paripurna | full(ness) |
| zhuangyan | vyāha | solemn(ity) |
| lunhui | Samsāra | reincarnation |
| bushi | dakṣiṇa | donation |
| rouyan | māṃsa-cakṣus | naked eyes |

Since propagation of Buddhism was carried out successfully and effectively, it immediately became very popular after its introduction in China. As was described in Yang Xuanzhi 杨衒之’s *Luoyang Qielan Ji* 洛阳伽蓝记 (*Record of Buddhist Temples in Luoyang*, around 547 CE), the Northern Wei Dynasty reached the pinnacle of Buddhism—there were over 1,000 temples in just Luoyang city (Fan 1958:2). After the

era of Northern and Southern Dynasties (420–589), the temple actively publicized the doctrines and teachings of Buddhism to the public, explaining its origins and the cause-and-effect metaphor by means of *changdiao* 唱導 ‘singing lead’ and *suijiang* 俗讲 ‘folk talk’, which promoted the production of a great many scripts for storytelling (*huaben*, 话本), a lot of them still stored in the Dunhuang 敦煌 Museum. Specifically, *bianwen* 變文 (literally ‘transformation text’, a genre of narrative literature to popularize Buddhism flourishing in the Tang Dynasty) exerted a huge influence on the Chinese folk literature. It later became the source of scripts for story-tellers after the Song Dynasty and stimulated the development of *baojuan* 宝卷 (literally ‘treasured volumes’, a literary form of story-telling and -singing), *zhugongdiao* 诸宫调 (a style of narration and songs with the Chinese tone scale of *gong* prevalent in the 11th century), *tanci* 弹词 (story-telling with the accompaniment of stringed instruments), and other stylistic art forms. Consequently, words of Sanskrit origin not only stayed in the Buddhist literature, but some of them also entered all aspects of people’s daily life, affecting ordinary Chinese people’s thinking, or even constituting the core of their moral values and mentality. The following words that most ordinary people would take for granted as Chinese actually originated from Sanskrit: *ta* 塔 (‘pagoda, tower’, from skr. Stūpa), *boli* 玻璃 (‘glass’, from skr. Sphatika), *jienan* 劫难 (‘calamity’, from skr. Kalpa), *yecha* 夜叉 (‘yaksha’, from skr. Yakṣa, nature-spirit or demigod), *mogui* 魔鬼 (‘devil’, from skr. Māra), *yanwang* 阎王 (‘Yama’, the ruler of the underworld, equivalent to the ancient Greek god Hades, from skr. Yama-rāja), *chanhui* 忏悔 (‘to repent’, from skr. Kṣama), *yishi* 意识 (‘consciousness’, from skr. mano-vijñāna).

As more Sanskrit words became active morphemes in the formation of Chinese lexicon, it became increasingly difficult to distinguish whether some compound words should count as Sanskrit or Chinese. How many Buddhist terms are in current use these days? Ting Fubao in his *Dictionary of Buddhism* listed more than 30,000 entries (Ding 1984). Of course not all of them are phonetically transcribed words or commonly used words. But it is evident that Buddhism has deeply influenced the Chinese language. In modern Chinese, quite a few frequently used words all originated more or less from Sanskrit. According to our statistical analysis of *People’s Daily* from July to December 2000, the word *shijie* 世界 ‘world’ was used 8,286 times—around 0.14% of the total number of words (6,001,367) from the data, ranking as one of the top 100 high-frequency words; *yishi* 意识 ‘consciousness’ appears 1,931 times, taking up 0.032%; *ta* 塔 ‘tower’ is used 1,186 times, taking up 0.02%; the last two words are both among the top 1,000 high-frequency words. Words containing the morpheme *ta* have become highly productive in the formation of modern Chinese vocabulary: *baota* 宝塔 ‘pagoda’, *tieta* 铁塔 ‘iron tower’, *shuita* 水塔 ‘water tower’, *dengta* 灯塔 ‘lighthouse’, *paotia* 炮塔 ‘turret’, *fota* 佛塔 ‘Buddhist pagoda’, *muta* 木塔 ‘wooden tower’, *shitā* 石塔 ‘stone tower’, *xietā* 斜塔 ‘leaning tower’, *gaota* 高塔 ‘high tower’, *gutā* 古塔 ‘cuthah’, *jinzita* 金字塔 ‘pyramid’, *dianshi ta* 电视塔 ‘TV station tower’, *jinianta* 纪念碑 ‘monument’, *xiangya ta* 象牙塔 ‘ivory tower’, *fashe ta* 发射塔 ‘launching tower’, *talin* 塔林 ‘pagoda tower’, and *tadiào* 塔吊 ‘tower crane’.

18.2 SANSKRIT INFLUENCE ON CHINESE GRAMMAR

The Chinese language employed in Buddhist literature is known as Buddhist Hybrid Chinese (Zhu 2009:1). It is a variant of Chinese characterized by the mixture of both classical and colloquial Chinese, with a great deal of Sanskrit loanwords and grammatical features. Buddhist Hybrid Chinese is not only used in the translation of Sanskrit texts but also used in the Buddhist literature written by Chinese monks and scholars. In other words, the impact of Sanskrit literature translation penetrated into the spontaneous use of Chinese.

The influence of Sanskrit grammar on Buddhist Chinese can be seen in the sentence patterns, word order, function words, new forms of expression, and so on. We discuss this in four subsections.

18.2.1 The Word *shi*

The word *shi* 是 ‘to be’ was not used in specificational sentences in ancient Chinese (normally, *shi* was used as a pronoun). Its usage as the copula “is” appeared in the late Warring States (475–221 BCE):

(1) Ci bi shi Yu-rang ye.
此 必 是 豫让 也。²

this must be Yu-rang.

This man must be Yu-rang.

but until the Han Dynasty it was still not commonly used. In *Cao Zijian Ji* (1936) 曹子建集 (*Collected Works of Cao*) *shi* appeared sixty-seven times, but only four among them could count as copulative use for sure, which is less than 6%. However, *shi* was frequently used as a copula in Buddhist translation in order to be faithful to the Sanskrit original. In *Bai Yu Jing* (1926–1931) 百喻经 (*100 Buddhist Parables*), which was translated in the Southern dynasty (420–589), the copula *shi* appeared in 90% of the specificational sentences (Xiang 2010:519). In Yang Xuanzhi’s *Record of Buddhist Temples in Luoyang* written in the Northern dynasty (386–534), the word *shi* showed up 127 times in total, sixty-seven of which were used as the copula, reaching 53%. The phenomenon of *shi* used as the copula in specificational sentences also affected non-Buddhist literature. An instance is Yan Zhitui’s *Yanshi Jiaxun* 颜氏家训 (*The Yan Family Teachings*), in which the word *shi* appeared 109 times, with fifty-eight of them used as the copula, also reaching 53% (Wang 1993), such as:

- (2) Wen zuoyou ci shi he wu.
问 左右 此 是 何 物。³

ask attendants this be what matter
(Someone) asked attendants what this was.

After Middle Chinese, the copulative use of *shi* became the basic form of Chinese specificational sentences.

18.2.2 The Word *gu*

The word *gu* 故 meant “reason, cause” in ancient Chinese, often used in complex sentences that involve a causal relationship. One usage was to put it in an adverbial clause of cause. For instance:

- (3) Lianghuiwang yi tudi zhi gu milan qi min er zhan zhi dabai.
梁惠王 以 土地 之 故, 糜烂 其 民 而 战 之, 大败。⁴

Lianghuiwang for land of reason smash his people and fight PRON be defeated
'For the sake of land, the King Hui of Liang exploited his people and drove them to war, but suffered defeat.'

Another usage was to put *gu* at the beginning of an adverbial clause of result, such as (4):

- (4) Kongzi yue wo yu guan xia dao shigu zhi qi.
孔子 曰: “我 欲 观 夏 道, 是 故 之 杞。”⁵

Confucius say I want seek Xia way for this reason go Qi
'Confucius said: 'I want to seek Xia dynasty's way of managing state affairs. Hence I have to go to Qi!'

It is clear that *gu* acted as a noun in the first example, but in the second, grammaticalization is in progress. Therefore, later we can use a single *gu* to indicate reason as a clausal marker. For example,

- (5) Ren you qi you sheng you zhi yiqie you yi
人 有 气、有 生、有 知, 亦 且 有 义

humans have breath have life have awareness also have righteousness

gu zui wei tianxia gui ye.
故 最 为 天 下 贵 也。⁶

hence most be world noble SFP

'Only humans possess breath, life, awareness, as well as the sense of morality; hence the noblest beings of the world!'

In this case, *gu* has completely grammaticalized into a conjunction. However, this use of *gu* was not employed in the adverbial clause of cause. In contrast, such usage of *gu* for the cause appeared frequently in Buddhist translation, such as (6) and (7):

- (6) Xin wu zhang'ai gu wu you kongbu.
心 无 障碍 故, 无 有 恐怖。⁷

heart without obstacle because not have terror

'Because there are no obstacles in heart, there is no terror either.'

- (7) Da bei wu suoyou gu dang zhi da xi yi wu suoyou.
大 悲 无 所 有 故, 当 知 大 喜 亦 无 所 有。⁸

great sorrow not have because should know great joy also not have

'Because there are no great sorrows, we should know there is no great joy either.'

These types of constructions have become a distinct marker of Buddhist literature. Affected by this usage, a grammaticalized conjunction such as *yin* 因 'because of' or *zhiyin* 只因 'just because', which indicates reason in the subordinate clause, was used extensively in Chinese complex sentences after Tang (618-907) and Song Dynasties (960-1279):

- (8) Zhiyin liang zhu sun, sui huan yishisan zhu.
只 因 两 柱 损, 遂 换 一 十 三 柱。⁹

just because two pillar damage then replace thirteen pillar

(Someone) replaced thirteen pillars, just because two pillars were damaged.

In Modern Chinese, more conjunctions are in common use, such as *yinwei* 因为 'because' and *youyu* 由於 'for reasons of'.

18.2.3 The Expressions of *yiyi* and *feichang*

The usage and meaning of certain Chinese words had changed in the translation of Buddhist canons. For example, when the numeral *yi* 'one' was reduplicated in ancient Chinese as *yiyi*, it usually served as an adverbial to modify verbs in the sentence, meaning "one by one":

(9) Xuanwang si minwang li hao yi yi ting zhi chushi tao.
宣王 死, 愍王 立, 好 一 一 听 之, 处 十 逃。¹⁰

Xuan King die Min King appointed like one one listen PRON. scholar flee

'After King Xuan died, King Min was appointed. He loved to listen to people one by one. So the scholars left.'

However, when *yi yi* was used in translated Buddhist texts, it modified nouns as an attributive adjective, meaning 'each'. This is because *ekaika* (< *eka eka* 'one one') means 'each one' in Sanskrit. For example:

(10) Long wang jizi bianshen chu sanshisan tou yi yi tou you liu ya.
龙 王 即 自 变 身 出 三 十 三 头, 一 一 头 有 六 牙。¹¹

Dragon King at once transform show thirty-three head each head have six tooth

'The Dragon King transformed himself at once and showed thirty-three heads, each head having six teeth.'

Therefore the reduplicated form was also used to mean 'every one' (每一—), as in (11):

(11) Zhenyan zhong mei yi yi zi jie shi zhufo quan shen.
真 言 中, 每 一 一 字, 皆 是 诸 佛 全 身。¹²

dhārāni in every one word all be Buddha whole body

'In dhārāni, every single letter is the Buddha's whole body.'

Another example is *feichang* 非常 'very', which was originally used as an attributive adjective to modify nouns in ancient Chinese literature:

(12) Shi bi you feichang zhi ren ranhou you feichang zhi shi.
世 必 有 非 常 之 人, 然 后 有 非 常 之 事。¹³

world certainly have extraordinary of man then have extraordinary of event

'There must have been extraordinary man, and then there are extraordinary events.'

Later the usage of *feichang* as a modifying predicate (used as an adverbial or as the complement) developed in the Chinese translation of Buddhist classics. See (13) and (14):

(13) Da wang zuo ye zao nan feichang xinku you wang fuli jiner ming cun.
大 王 昨 夜 遭 难 非 常 辛 苦。由 王 福 力 仗 尔 命 存。¹⁴

great king last night suffer disaster very exhausting because king luck only life survive

'The king was suffering very much last night. It was only thanks to the king's good luck that he survived.'

(14) Wang zao da nan xinku feichang.
王 遭 大 难 辛 苦 非 常。¹⁴

king suffer great disaster exhausting very much

'The king went through great hardships and was suffering very much.'

Among these new usages, some exist only in Buddhist literature; others have gained recognition in the secular language and literature and thus remained in modern Chinese until today.

18.2.4 The Negation Word *bu*

Some of the expressions found in Buddhist translation were rarely or never used in the Chinese language or literature before the transmission of Buddhism. Take as an example the reply of denial *bu ye*, *shizun* 不也, 世尊. This form is from Sanskrit *nohīda bhagavant*¹⁵ (< *na hi idam bhagavant* 'No, bhagavant'), which is used to answer questions posed by the Buddha. This pattern contains an adverb of negation plus a vocative noun. Before the Han Dynasty, the negative adverb *bu* was generally not used alone to answer a question, nor was it followed by a salutation. The answer to a negative question often involves such fixed expressions as *buran* 不然 'not so', *buke* 不可 'may not', *bu neng* 不能 'cannot, must not', or the structure of *bu* followed by a verb. But there were numerous such constructions of *bu* followed by a vocative in Buddhist discourse. There were 4,729 cases of this usage in Mahā-prajñāpāramitā-sūtra alone. Such expressions also frequently appeared in the Zen Buddhist literature later. They appeared in the colloquial language and folk literature as well. In Modern Chinese this type of structure is even more commonly used. In searching Beijing University's Modern Chinese Corpus (http://ccl.pku.edu.cn:8080/ccl_corpus/index.jsp?dir=xiandai), 721 cases of the negative adverb "bu, + vocative" or "bu, . . ." used alone in answering sentences are found. Among them, seventy cases involve *bu* followed by a vocative noun.

From these examples we can see that the influence of Buddhist Sanskrit has lasted over 2,000 years. It is thus fair to say that Sanskrit-influenced Chinese has become an indispensable part of modern Chinese. Just as the salt dissolved in water would lose its original form and state, most people have grown so accustomed to those Sanskrit-derived terms and constructions that they often fail to notice their foreign origin.

18.3 SANSKRIT INFLUENCE ON CHINESE PHONOLOGY

The Chinese character, or the sinogram, is a morphosyllabic writing system of logograms in which each character corresponds to a complete syllable. This makes it

extremely difficult to study the phonological structure of these characters. Before the Eastern Han dynasty, Chinese scholars did not have sufficient knowledge to effectively and accurately mark the pronunciation of sinograms. If they had to indicate the reading of a certain character found in the classical literature, they could only do so by means of *pikiang* 譬况 'analogy' and description (A is read as B). But the effect of such phonetic notation was quite restricted. Therefore, starting from the end of the Eastern Han Dynasty, a new phonetic method called *fangqie* 反切 emerged. This traditional method consists of indicating the pronunciation of a Chinese character A with two Chinese characters B and C. B and A share the same initials, whereas C and A share the same finals and tones. For instance, the pronunciation of 芒 is represented as 莫郎切: mang 芒 = m(ak) 莫 + lang 郎; that of 禿 is represented as 他谷切: thuk 禿 = th(a) 他 + k(uk) 谷. In this way the pronunciation for any sinogram can be indicated with accuracy. The emergence of *fangqie* shows that those who adopted this method had already learned to analyze the two parts of Chinese syllables: the *shengmu* 声母 'initials' and *yumu* 韵母 'finals'. Their ability to distinguish these two components demonstrates that their phonetic knowledge had transcended the limits of sinograms, which give no clue of the pronunciation. Some modern scholars believe that the notation method *fangqie* was inspired by Sanskrit because Sanskrit is an alphabetic writing system. Others instead argue that *fangqie* had nothing to do with Sanskrit and that it was invented independently by the Chinese scholars. In any case, it is obvious that the invention of *fangqie* coincides with the translation of Buddhist scriptures in the Chinese history.

Rhyme dictionaries emerged in the period of Northern and Southern dynasties. They collected various examples of *fangqie* and classified each tone and each rhyme into different categories, giving each tone and rhyme a specific name that provided poets with ease of reference in composing poems. A few adept scholars who were skilled at phonology revised the dictionary so that its analyses of initials, finals, and tones became more precise. The publication of the rhyme dictionary *Qieyun* 切韵 and a series of amendments to it represent the development of such phonetic knowledge. However, these rhyme dictionaries are not without flaws from the viewpoint of phonetics. For instance, they cannot equip people with the direct knowledge of Chinese phonemes, nor do they directly identify and name the initials. Moreover, special training is usually required to master *fangqie*, which makes it difficult for everyone to acquire this skill. In consequence, *fangqie* remained a profound esoteric branch of study restricted to only a small group of the learned.

During the Sui and Tang Dynasties, while translation of Buddhist canons reached its peak, knowledge of Sanskrit also became diffused among the Chinese monks. The introduction of the ancient Indian Śabdavidyā (*shengmingxue*, 声明学) and Siddham (*xianxue*, 悉曇学) had a tremendous impact on Chinese phonology. Śabdavidyā is the study of phonetics of ancient India, while Siddham is the introductory knowledge of Sanskrit. All the possible syllables of Sanskrit, including consonants, vowels, and their combinations, were listed in a diagram so that beginners could quickly acquaint themselves with the basic knowledge of Sanskrit phonetics. This inspired Chinese scholars who also designed a diagram to list all the Chinese syllables from rhyme dictionaries including initials, finals, and tones. This diagram is called *dengyuntu* 等韵图.

Dengyunxue 等韵学 is thus the study of the place as well as the manner of articulation of Chinese consonants and vowels, including the classification and combination rules of these speech sounds. It is a milestone that marks the beginning of systematic study of Chinese phonetics. The Dengyun diagram also simplified the way of sound and sinogram identification. Therefore, it presents the system of Chinese speech sounds, rhymes, and tones more concisely and directly than rhyme dictionaries, revealing the essence of the Chinese phonetic system and its composition and combination rules. Since the Ming (1368–1644) and Qing Dynasties (1644–1911), many scholars have made use of the Dengyun diagram to record and describe the phonetic system of the common language and the local dialects of their times, which has left us with valuable information and a legacy on the historical linguistics of Chinese.

Modern scholars who study the speech sounds of ancient and Middle Chinese still make use of the knowledge of Sanskrit and Sanskrit-Chinese sound correspondence materials. For instance, Wang Rongbao used materials of transliterated Sanskrit in Chinese characters and proved that the sound values of the rhyme group *yu* (魚部) of archaic Chinese is *a*, not *u*. Yu Min reconstructed the system of the consonants, vowels, and tones of Chinese in the Eastern Han Dynasty and the Three Kingdoms era (220–280; see Wang 1923; Yu 1984). Other scholars like Li Rong and Luo Changpei also reconstructed the common language in medieval China and the sound system of northwestern dialects through Sanskrit-Chinese sound correspondence (see Li 1952; Luo 1961). Knowledge of *dengyun* has become one of the essential requirements for modern phonologists and dialectologists.

NOTES

1. The original reads: "秘密故不翻、多义故不翻、此方所无故不翻、承古故不翻、生善故不翻。"
2. Sima 2011:2521
3. See Wang 1993:215. Yan Zhitui (颜之推, 531–c.595)
4. *Mencius*, Jinxin, part II 《孟子·尽心·下》. See *Shisanjing Zhushu* 1980.
5. *Liji*, Liyun 《礼记·礼运》 (*Book of Rites*, chapter: The Conveyance of Rites). See *Shisanjing Zhushu* 1980:1415.
6. *Xunzi*, Wangzhi 《荀子·王制》. See *Ershier Zi* 1986:304.
7. *Prajñāpāramitā-hrdaya-sūtra* 《般若波罗蜜多心经》 1926–1931.
8. *Mahā-prajñāpāramitā-sūtra* 《大般若波罗蜜多经》 1926–1931.
9. See *Ouyang Xiu Quanjì* 2001:1639. Ouyang Xiu (1007–1073).
10. *Hanfeizi*, Nei chu shuo shang 《韩非子·内储说上》 (chapter: Inner Congeries of Sayings, The Upper Series). See *Ershier Zi* 1986: 1151.
11. *Dīrghāgama* 《长阿含经》 1926–1931.
12. *Cundī śuci karmān* 《推提净业》 1975–1989.
13. *Sima Xiangru liezhuan* 《史记·司马相如列传》 (*The Historical Records*, chapter: Biography of Sima Xiangru). See Sima 2011:3050.
14. *Māla-sarvāstivāda-vinaya-ksudraka-vastu* 《根本说一切有部毘奈耶杂事》 1926–1931.
15. *Vajracchedikā prajñāpāramitā sūtra* 《金刚般若波罗蜜经》 1926–1931.

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CHAPTER 19

LANGUAGE CONTACT
BETWEEN TIBETO-BURMAN
LANGUAGES AND CHINESE

FENG WANG

19.1 INTRODUCTION

WITH a large body of cognates and shared morphology (van Driem 2001; Gong 2002), Tibeto-Burman languages are considered to be genetically related to Sinitic languages (Chinese dialects), while Kam-Tai and Miao-Yao have been removed from the Sino-Tibetan family, due to the resemblances between them and the Sinitic language resulting from language contact (Benedict 1972; Chen 1996). Furthermore, the earlier hypothesized split into the two major branches, namely, Tibeto-Burman and Sinitic, has recently been challenged. The main reason is that no innovations are uniquely shared by Tibeto-Burman languages but not by Chinese (van Driem 1997, 2001). It seems more reasonable to put the Sinitic branch as a later development under the Tibeto-Burman languages. For example, according to the Sino-Bodic hypothesis (van Driem 1997, 2001), Sinitic is placed in the same branch (Northern group) as Bodic under the Eastern Tibeto-Burman family, as shown in Figure 19.1.

It should be noted that new proposals for Tibeto-Burman languages and Sinitic languages like Sino-Bodic (van Driem 1997) or Sino-Kiranti (Starostin 1994b) are questioned because not enough shared innovations are tenable for the bifurcation in the new tree diagrams (Matsoff 2000). As to the current state of studies on Tibeto-Burman and Sinitic languages, Figure 19.2 includes well-established subgroups roughly arranged by their geographical distributions (from van Driem 2001).

The Bodish, Tshangla, Lhokpu, Qiangic, and Ersu cluster are found mainly in northwestern China, with Nungish, Lolo-Burmese, Tujia, and Bai in southwestern China.

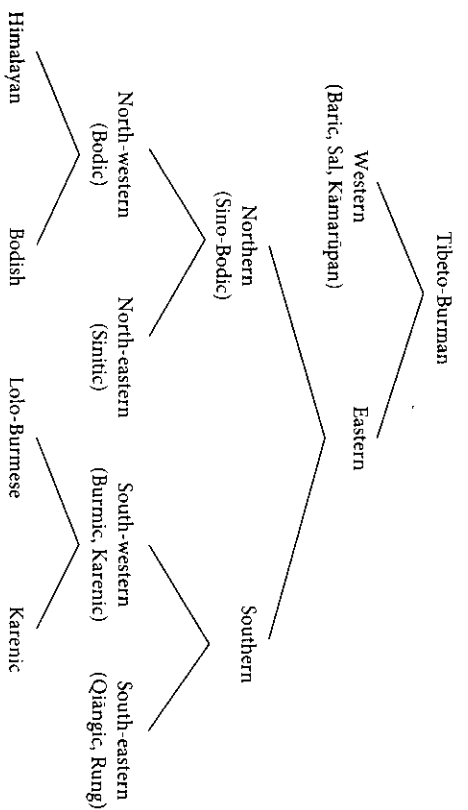


FIGURE 19.1 The Sino-Bodic Hypothesis

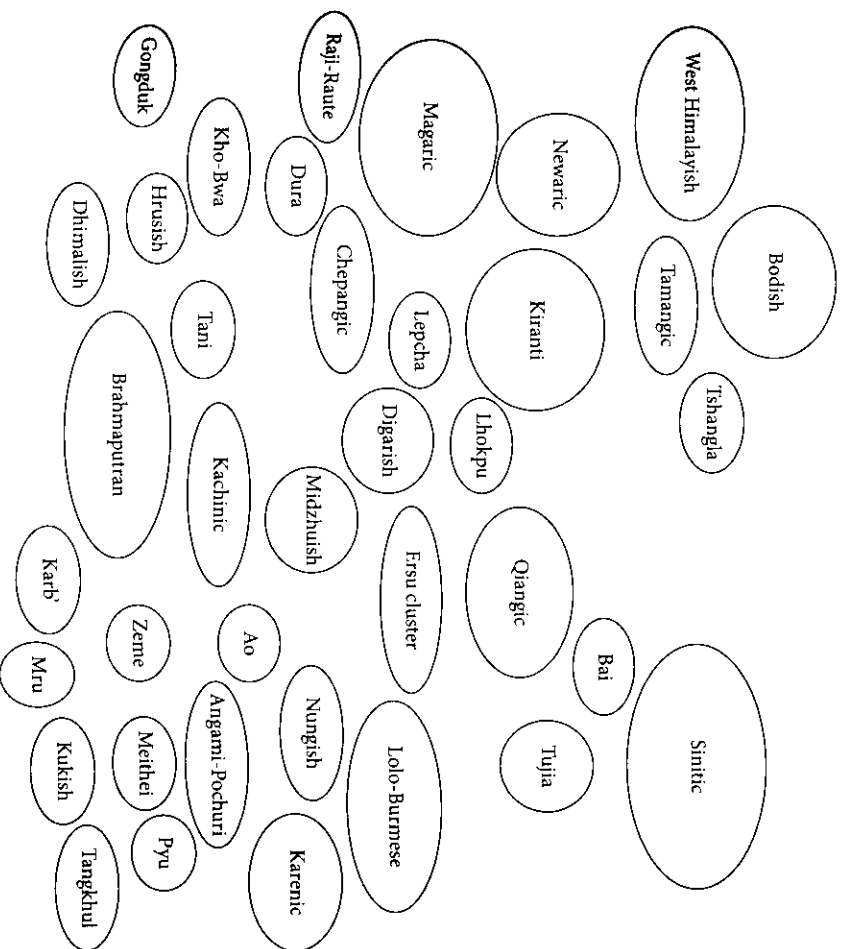


FIGURE 19.2 Subgroups in Tibeto-Burman area

Although Sinitic languages are now almost ubiquitous within China, 3,000 years ago, Sinitic merely started from the Central Plains along the Yellow River. The remaining areas of modern China are occupied by other languages from Altaic, Tibeto-Burman, Kam-Tai, Miao-Yao, Austronesian, Austric, and others. It is estimated that Proto-Sino-Tibetan existed 6,000 years ago (Wang 1998). After that, Sinitic split from the others, although the exact date of splitting is uncertain. The earliest written form of the Chinese language, the oracle bone inscriptions, can be dated back to the late Shang dynasty around 1400 to 1100 BCE. Therefore, the split of the Chinese language from the Proto-Sino-Tibetan may have occurred around 4,000 years ago, with the earliest form generally called Old Chinese.

The development of Old Chinese is associated with the spread of the Chinese civilization, with the Yellow River basin as the cradle of Chinese civilization (Ho 1976). The capital of the Shang Dynasty, Yin, is located in Henan, where shell and bone fragments engraved with characters (oracle bone inscriptions) have been unearthed. Most of them are records of divination regarding activities of the royal family. The ancient *Shangshu-Duoshi* (尚书·多士) text states that "only the ancestors of the Yin people possessed written volumes (*Wei yin xianren, you ce you dian* 惟殷先人有册有典)". In ancient China, *Hanzi* (Chinese characters) make up the earliest and most influential script. The other scripts created by Tibetan-Burman ethnic groups appear much later with limited scope (e.g., Written Tibetan in the 7th century CE, Bai script around the 10th century CE, Tangut script in the 11th century CE, and Tomba script around the 11th century CE. Scripts similar to the Bai script have even been created by imitating the Chinese characters. The spread of Chinese characters reflects the scope and the depth of influence from the Chinese language (Wang et al. 2009). Meanwhile, the earliest record of language contact between Chinese and Tibeto-Burman languages can be detected either directly from the Chinese literature or indirectly from the development of the Chinese characters. While the Tibeto-Burman groups have been given different names in Chinese literature, it is generally believed that those distributed in northwestern China are the offspring of the ancient Di-Qiang 氏羌, while those in the southwest are mainly from Yi 夷.

Mandarin Chinese has become the standard language in China and is adopted as a second language in Tibeto-Burman areas. Meanwhile, local languages have been influenced by Mandarin. Two Tibeto-Burman languages, Qiang 羌 and Tuja 土家, can be the example. It is noted that the southern Qiang languages have developed tonal systems due to close contact with the surrounding Mandarin, while the northern Qiang languages have maintained their nontonal status due to their distance from tonal languages (Liu 1998). Also noteworthy is the high tone of the Tuja languages, which splits into two in the southern dialects where more Chinese loanwords are found (Zhang 2008). Nowadays, language contact between Tibeto-Burman and Chinese are happening daily with greater breadth and depth than ever before.

19.2 MIGRATIONS AND LANGUAGE CONTACT

In the long history of China, population movements have been quite frequent and complex. For the Han Chinese, the major direction has been from north to south, with continuous migrations resulting in seven major Chinese dialects (also called "Sinitic languages"; i.e., Mandarin, Wu, Xiang, Gan, Hakka, Cantonese, and Min). Roughly speaking, Mandarin speakers are distributed in the provinces of Northern China, Sichuan, Guizhou, and Yunnan, which comprise more than 70% of the Chinese people (Yuan 1983). As for Tibeto-Burman speakers, there are two major lines of movement beginning around 6,000 years ago: one to the west into Tibet and then on to Nepal, Sikkim, Bhutan, and India and the other to the southwest, along the so-called "Zangyi 藏彝 Corridor" or "ethnic corridor" (Fei 1980; LaPolla 2001; Shi 2009). Such routes are also supported by genetic evidence based on Y chromosome haplotypes (Su et al. 2000).

Through the studies along the Ancient Tea-Horse Trail (茶马古道), it is now realized that these two lines can be built into a larger picture of the ancient traffic network that connected the mainland of China (mainly, Sichuan, Tibet, and Yunnan) with India, Nepal, Bhutan, and Southeast Asia. The center of this network was the huge triangle area of Hengduan 横断 Mountain in Yunnan, Sichuan, and Tibet. In the Tang Dynasty (618–907 CE), the Dian-Zang 滇藏 (i.e., Yunnan-Tibetan) Tea-Horse Trail was established due to the high demand for tea (Chen 1992, 2004; Mu et al. 1992). Trade of tea and transport by horse (the major means of transportation at that time) gave birth to the ancient trails, and along these routes people speaking different languages came into contact with each other, thus producing many contact languages along the way, most notably varieties of Southwestern Mandarin, which became the most important communication languages along the ancient roads (Mu et al. 1992).

Before the Tang Dynasty, the Han Chinese had little to do with the Tibetan groups, though the Han Chinese central government set up some administrative offices throughout southwestern China (e.g., Qianwei 犍为 in 135 BCE. In 641 CE, the emperor Taizong of the Tang Dynasty sent Princess Wencheng 文成 to marry the king of Tubo 吐蕃, who united the Tibetan people. This marriage bridged the transmission between the Chinese and Tibetan cultures. After that, the Tibetan people came into close contact with the Han Chinese. To the south of Tubo in the present-day Yunnan province, another kingdom, Nanzhao 南诏, was established by another group of Tibeto-Burman speakers between 752 and 902 CE. In the kingdom, the noble families of Baiman 白蛮 (the ancestors of the Bai people) played an important role for their wealth and advanced culture (Wang and Yang 2004). Finally, the Baiman became dominant and put an end to the Nanzhao kingdom. Over the next period, three kingdoms were successively set up by the Baiman nobles. First, a stable kingdom, Dali 大理, was founded in 937 and lasted about 300 years until 1253. During the Dali period, the development of Baiman and the importation of Han culture reached a peak, as mastering Chinese literacy was highly regarded at that time. The Mongolians of the Yuan Dynasty, spanning from the mid-13th

century to the mid-14th century, eradicated the Dali kingdom. These Mongolian rulers conquered northern Burma in 1283 but did not ultimately gain actual control, since the Shan 掸 and other Tibeto-Burman groups held northern Burma at the time. Consequently, this area was not very much influenced by the Han Chinese. In the Ming Dynasty (1368–1644 CE), a new policy to massively migrate people into Yunnan was implemented, thus breaking the earlier population pattern of varying ethnic groups. The percentage of Han people became greater than the Bai people and any other ethnic group. In the late Ming Dynasty, a new title, *Minjia* 民家 ‘common people’, was used for the Bai people in order to distinguish them from the *Junjia* 军家 ‘military people’, who were mainly soldiers who had migrated from central China (Ma et al. 1988:29). The *Minjia* title remained in use until the Bai people finally became identified as an independent Bai nationality by the government in 1956.

The Nanzhong area (including most of today’s Yunnan, Guizhou, and southwestern Sichuan) is a crucial point on the ancient Tea-Horse Trails, where Tibeto-Burmans and the Han Chinese mixed. During the Han Jin 汉晋 period (206 BCE–420 CE) Nanzhong Daxing 南中大姓 ‘the great families of the Nanzhong region’ were the dominant families with strong economic and political power, practically constituting the local authority. Their origins are quite complicated, including some Chinese immigrants during the Han Jin period and some important families of local ethnic groups. These local elites were willing to accept the Chinese civilization and very likely formed the so-called Baiman group. In Chinese literature, there have been many documentations showing how the Han and local people fought and ultimately compromised. Under this complex and intense interaction, language contact is naturally unavoidable. Presumably, some varieties of Chinese would be formed and then chosen as the lingua franca within this area. It is also likely that the Proto-Bai served this function (Wang 2012).

19.3 BORROWINGS AND HISTORICAL STRATA

As stated previously, different varieties of Mandarin were developed in various regions. Tibeto-Burman speakers would have encountered Lanyin 兰银 Mandarin, or Zhongyuan 中原 Mandarin, in Qinghai and Gansu and Southwestern Mandarin in Sichuan, Guizhou, and Yunnan. Once two languages enter into contact, the first action is to borrow words representing new items and concepts, since either language short of such may feel the lexical voids to express new concepts. This process is thus bidirectional (Chen 1996). For instance, the Tibetan *rams* ‘Polygonum tinctoria’ comes from the Chinese **c-lan*¹ ‘fragrant thoroughwort’, and the Tibetan *pir* ‘writing instrument’ from Chinese *pyit* ‘writing instrument’ (Lauter 1916); the Chinese *la*²¹⁴ *ma* ‘Tibetan monk’ comes from the Tibetan *lama* ‘a title for a Tibetan teacher of the Dharma’.

If both languages have their respective words for the same concept before contact, borrowing may be unidirectional, from the prestigious to the nonprestigious. Given the long-term prestigious status of Chinese, it almost always plays the donor language

in Sino-X contact (X stands for any minority language in China). Therefore, it is not surprising that a particular section dedicated to Chinese loanwords can be found in any of the fifty-seven *Brief Introductions of Minority Languages in China* in the 1980s. A description about Chinese loanwords is also found in the book *Fifteen Tibeto-Burman Languages* and the *New Found Minority Languages in China* series. According to Chen (1996), Tibeto-Burman speakers would use their own phonological system to accommodate the target Mandarin Chinese. For instance, the Lavrong language in Sichuan uses alveo-palatal affricates, *tc* and *tcʰ* for the retroflex affricates, *tʂ* and *tʂʰ*, whereas palatal affricates, *cç* and *cçʰ*, are produced for the Mandarin alveo-palatal, *tç* and *tçʰ* (Huang 2007:154).

If borrowed words do not replace native words but coexist with them, historical strata can be revealed. Words from the same time depth form an independent stratum. Many Tibeto-Burman languages keep importing words from Chinese at different periods, and then multiple strata have been formed. If borrowed words are treated as the native elements, the genetic relationship between these languages will be misinterpreted. Such situations call for “stratification” in order to rule out borrowings and to clarify the genetic lineage. However, it is found that borrowing can also result in strict sound correspondences in the same way as those cognates do. Moreover, even basic words in the Swadesh 100 list (Swadesh 1955) can be borrowed (Chen 1996; Wang 1996). Given the long-term contact between Chinese and Tibeto-Burman, the stratification work becomes very challenging. In Chinese linguistics, the term *guanxi* 关系 ‘related words’ is promoted to refer to words between languages with sound correspondences. The related words may be inherited from the proto-language or borrowed from another language. Sagart and Xu (2001) studied loanwords from Chinese to Hani, a Loloish language of Tibeto-Burman. Two major strata were figured out according to Chinese historical phonology and cultural cues. The source of the later stratum is Mandarin. For example, *ja*³¹ *yu*⁵⁵ ‘洋芋’ *patato*, *a*⁵⁵ *si*³¹ ‘星’ *star*, *go*³¹ ‘高’ *high*, *da*²⁴ *me*³¹ ‘大麦’ *barley*. The source of the early stratum is before Mandarin, presumably Middle Chinese. For example, *la*⁵⁵ *dzi*³³ ‘骡子’ *mule*, *o*³¹ *ŋo*⁵⁵ ‘鹅’ *goose*, *bu*⁵⁵ ‘浮’ *float*, *by*³¹ ‘富’ *rich*. The contact between Hani and Chinese appears to be moderate. Many cultural words and quite a few noncultural notions have been borrowed from Chinese to Hani at different periods. Thus exciting stories can be told about the stratification of Chinese loanwords, and many other similar cases of Sino-X in the Tibeto-Burman area are yet to be discovered.

19.4 LANGUAGE SHIFT AND INTERFERENCE FROM THE MOTHER TONGUE

Two interesting cases of language shift in Tibeto-Burman areas are the Wutun 兀屯 language and the Daohua 倒话 language. In the Wutun language, a so-called mixed language of Tibetan and Mandarin in Qinghai (Chen 1982), eighty-two out of the Swadesh

100 basic words are purely from Chinese (e.g. *da* 大 'big', *shu* 树 'tree', *xai* 血 'blood', *se* 死 'die'), and sixteen items can be represented either by Chinese or by Tibetan words. Only two items, [w^ha] 'mountain' and [to] 'head', are thought to come from the local Baoan 保安 language of Mongolian (Acuo 2004:218; cf. Janhunen et al. 2008:117). As for the Daohua language in Sichuan, a language similar to the Wutun language, all the Swadesh 200 basic words (Swadesh 1952) have a Chinese origin. In summary, the major body of the basic vocabulary of both Wutun and Daohua is Sinitic. However, considering cultural terms, both of them have words of Tibetan origin, especially for indigenous animals, plants, and religious terms. For example, in Daohua, *mɛ³ jia³* 'peacock' is from Tibetan *rma bya*; *za²ba¹* 'birch' from *sdaq pa*; *ka²wui¹* 'protective talisman' from *ga yu* (Acuo 2004:40). In Wutun, *dzo* 'male yak' is from Tibetan *vdzo*; *ɣatɔ* 'male goat' is from *ra tɔŋ*; *tsho lake* from *misɔ* (Janhunen et al. 2008). Moreover, their morphosyntax is typically non-Chinese. The Wutun language is verb-final. Nouns are specified to be singular or plural by suffixes, -ka or -tɔɔ, and more than ten different suffixes are used for verbal inflections (Chen 1982, 1989; cf. Janhunen et al. 2008). For example (Janhunen et al. 2008:55):

ŋa-ha mɔ ɬaŋ-ka jɔy
 1P.SG.OBL-FOC horse two-CL EXIST
 'I have two horses.'

The Daohua language is also verb-final, with morphological alternations of verbs very similar to Tibetan and many case markers that can be traced back to Tibetan. In summary, its morphosyntax system may be attributed to Tibetan (Acuo 2004). Basic words and morphosyntax of either Wutun or Daohua seem to tell the different stories. Thus they are often quoted as an example of creole in China. However, how the "creolization" occurs in the history is still a question. It is uncertain whether this is a case of a Chinese variety influenced intensively by Tibetan or a Tibetan variety influenced by Chinese.

Nowadays Mandarin Chinese (*Guanhua* 官话 in Chinese) is often a second language of Tibeto-Burman speakers, but it is very difficult for many of them to attain high-level proficiency due to mother-tongue interference. Thus different varieties of contact languages can be observed among Tibeto-Burman speakers. Lexically, most basic words of these varieties are from Mandarin Chinese in order to facilitate communication with Chinese people. Meanwhile, many morphosyntactic features of their Tibeto-Burman mother languages have been brought into these varieties. Tibeto-Burman speakers were found to often place the verb finally when they speak Chinese (Li 2009; Zhang and Qubi 2010), especially those with a lower Chinese proficiency. The verb-medial Chinese becomes verb-final in these varieties. Once a later generation adopts such a variety as the mother tongue, then language shift occurs. Both the Wutun language and the Daohua language are very likely a result of such language shift to Chinese varieties with interference from their Tibetan mother tongues (Chen 2005).

19.5 THE CASE OF THE BAI LANGUAGE

The Bai language is mainly spoken in Yunnan (Xu and Zhao 1984). Quite a few other ethnic groups (such as the Lisu, Yi, Naxi, and so on) who live with the Bai people also have contact with this language. For a long time, the Bai people have been assimilated to the Han culture; thus most of them speak Chinese quite fluently, usually a Southwestern Mandarin dialect. With so many languages simultaneously at work, it comes with little surprise that the Bai language has developed a "mixed" outlook, which was recognized a century ago (Lacouperie 1887). The position of the Bai language in Sino-Tibetan family has been a "puzzle," mainly due to its heavy contact with Chinese. There are an enormous number of Sino-Bai related words in Bai, with up to 70% of the Bai vocabulary thought to be of Chinese origin (Luo 1989). It remains controversial whether these related words are borrowings or cognates inherited from a common ancestor.

Lacouperie (1887) and Davies (1909) claimed that Bai is genetically related to Mon, and the words related to Chinese, Mosso, Lolo, and Tibetan were obviously borrowed. Wen (1940) questioned their arguments and proposed that native Bai words belong to Tibeto-Burman (Wen 1940:26). Henceforth, the main controversy about Bai concerns whether it is genetically more closely related to Chinese or to Tibeto-Burman. Benedict (1982) and Zhengzhang (1999) supported the former claim. Starostin identified systematic sound correspondences between Chinese and Bai. Based on glottochronological calculations and Chinese historical phonological information, he concluded that "Bai is, in fact, an archaic Chinese dialect, having separated from 'mainstream' Chinese long before all other dialects (including Min) — somewhere around the late 1st millennium BCE" (Starostin 1994a:1). Zhao (1982) and Matisoff (2001) instead argued for the Tibetan-Burman origin. Lee and Sagart (1998, 2008) maintained that in the Bai language 47% out of the 100 Swadesh words were borrowed from Chinese during its early development. They also identified that some words in the Swadesh 100-word list are of Tibeto-Burman origin, such as *I*, *you*, *we*, *this*, *who*, *not*, *one*, *two*, *fish*, *flesh*, *blood*, *fat*, *tail*, *nose*, *breast*, *fly*, *walk*, *mountain*, and *name*. Wang (2006a, 2012) reconstructed the Proto-Bai on the basis of comparisons of nine different Bai dialects. The oldest stratum of the Sino-Bai related words are distilled. In addition, the more basic the word groups are, the greater number of Sino-Bai related words can be identified (i.e., thirty-nine related words in the Swadesh 100 words while twenty-three related words in the rest of the Swadesh 200 words). Such distribution of related words between Bai and Chinese strongly suggests that the relatedness between these words is due to inheritance from their common ancestor rather than borrowing (cf. Chen 1996).

As early as 1916 (Li 1916), the claim that Bai is a Yi-Chinese Creole was proposed. It was followed by Luo (1989) and Wiersma (1990), among others. Dai et al. (1994:15) reinterpret this idea as follows:

Table 19.1 Basic word-orders of Bai, Chinese and Yi

| Bai | Chinese | Yi |
|---------------------|----------------------|---------------------|
| Modern Bai dialects | Old Chinese | Modern Yi dialects |
| VO (/OV?) | VO: (/OV) | OV |
| Modifier + Head | Modifier + Head | Noun + Adj. / Clas. |
| ReIN | ReIN | Modifier+Head |
| Prep. + Noun/Pron. | (Prep. + Noun/Pron.) | ReIN |
| Noun + Num. + Clas. | Noun + Num. + Clas. | Noun/Pron. + Prep. |
| | | Noun + Num. + Clas. |

Some basic words and ancient phonetic and syntactic features are similar to Burmese-Yi languages. Basically, their genetic relatedness can be confirmed. However, due to heavy contact with Chinese for almost 2,000 years, lots of Chinese elements have been transmitted into Bai... Regarding this important structural change of Bai, we should rethink its position when defining its genetic relationship. We should not ignore a scenario of language development in which due to the long-term influence from the language of a different family, a certain language becomes increasingly dissimilar to languages of the same family. Then it may become a Creole, or closer to languages of a different family. In any genetic classification, this type of language should not be totally ignored. We should try to find its earlier position and also point out its future direction of development. (translation mine)

The relationship between Proto-Bai, Proto-Yi, and Old Chinese is examined in Wang (2006b). Based on shared basic words and shared semantic innovations, the genetic structure of ([Old Chinese, Proto-Bai], Proto-Yi) is suggested. From comparison of the basic morphosyntactic characteristics, there is no sufficient clue to claim the shift of the Bai language from Yi to Chinese. Table 19.1 shows the basic word orders for the three languages.

It can be seen that the Bai language is closer to the Old Chinese than to Yi.

Anyway, the Bai language has grown in an area of Tibeto-Burman speakers with continuous influence from Han Chinese. In a nutshell, the mechanisms of borrowing and language shift stated previously contribute to the multiple facets of Bai, though the historical details still await further studies.

19.6 FINAL REMARKS

The Chinese languages evolved out of the Sino-Tibetan language family along the Yellow River, while Tibeto-Burman languages remained scattered in the mountains and valleys of western China. The Han Chinese gradually became a culturally and socioeconomically dominant power in China thousands of years ago. Tibeto-Burman languages have come into contact with Chinese for a long time. Due to different linguistic and other sociocultural backgrounds, different contact-induced changes emerged. Despite

such diversification, two basic mechanisms can be generated, namely, borrowing and language shift. Some so-called Creolization is in fact language shift to Chinese with interference from the Tibeto-Burman mother tongue, which is exemplified by the cases of the Wutun language and the Daohua language. Interestingly, the Bai language distributed in the Tibeto-Burman area a long time ago is not the same case, since recent studies have found Bai a sister language of the Han Chinese, as evidenced by the existence of Sino-Bai cognates and a similar syntactic system.

Complex varieties have been developed by contact between the Tibeto-Burman languages and Chinese throughout history along the ethnic corridor. The process of their formation is only beginning to be revealed in recent years. Fortunately, many new varieties are now being discovered and the intricacies of contact situations can be directly observed. Indeed, languages of these regions may be a burgeoning area of research for linguistics in the new century.

NOTES

1. The old Chinese reconstruction is from Baxter (1992) henceforth.
2. It occurs in a negative or interrogative sentence, or when the pronoun is one of the double objects.

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PART 4

MORPHOLOGY

MORPHOLOGY

Morphemes in Chinese

JEROME L. PACKARD

MORPHEMES are traditionally defined as the smallest parts of spoken language whose meaning can be identified and isolated. Chinese morphology, then, is the identification, analysis, and description of Chinese morphemes and how those morphemes combine to build larger language structures (i.e., words). As a first step in identifying morphemes in Chinese, a useful exercise is to consider a Chinese dictionary such as the *Xin Hua Zidian* 新华字典 (*New China Character Dictionary*).

Looking at the listed entries, it is clear that in Chinese most morphemes are one syllable long: there are few Chinese morphemes that are more than one syllable and fewer still that are smaller than one syllable. If we conservatively estimate the number of entries per page in the *Xin Hua Zidian* at about fourteen and multiply this by the number of pages (613), we get an estimated total of about 8,582 entries. What does this number represent? If we say that 8,582 represents the number of morphemes in Chinese, that would be a low estimate, because many of the character entries represent more than one morpheme.¹

The point is that Chinese has a very large number of morphemes at its disposal, most of which are homophonic. This is not unlike a language like English, which also has a number of homophonic morphemes. Take the English syllable *bank*, for example, which represents at least four different morphemes²: as a noun it can mean 'financial institution' or 'side of a river' and as a verb it can mean 'to turn (an airplane)' or 'to hit a ball into the cushion (in billiards)'. The difference between English and Chinese on this score is that Chinese is rife with homophonic morphemes while English has relatively few.

20.1 CLASSIFYING CHINESE MORPHEMES

Let us next consider the linguistic properties of Chinese morphemes. Every morpheme in Chinese may generally be classified according to two criteria: first whether it is *free*

or *bound* and second whether it is *content* or *function*. In addition, content morphemes may also be classified according to their *form class* or *part of speech*. We next discuss how these terms are defined and how those classification decisions are made.

20.1.1 Free Versus Bound

The first basic characteristic of a morpheme is whether it is *free* or *bound*. If a morpheme can stand alone in an utterance to represent a grammatical form class (part of speech) category, it is *free*. If it must be augmented with additional language material before it can occur in an utterance, it is *bound*. As a corollary, if a morpheme is *free*, then it is also a *word*.

For example, the morphemes *da* 打 'hit' and *ji* 寄 'send (mail)' are clearly free, because they can stand independently as sentence verbs. For example, you can say *bie rang ta da wo* 别让他打我不让他打我 'don't let him hit me' or *ni hai mei ji neige baoquo* 你还没寄那个包裹 you still not mail that:CL package 'you still haven't mailed that package'. In the same way, the morpheme *shu* 书 'book' is free, because it can stand independently as a noun, as in *ni hai mei mai shu* 你还没买书 you still not buy book 'you haven't bought the book yet'.

The morpheme *ti* 体 'body', on the other hand, is bound, because it cannot be used by itself as a noun within an utterance. To use *ti* in a sentence it must be used together with another morpheme in a complex word, such as *jiti* 集体 'collective', *tiyu* 体育 'physical', *shenti* 身体 'body', *tili* 体力 'physical strength', *juti* 具体 'concrete (vs. abstract)'; *tihui* 体会 'intuit', *daoqi* 导体 (electrical) conductor', *tizhong* 体重 '(body) weight', *meiti* 媒体 'media', or *timian* 体面 'dignity'. In similar fashion, the verb morpheme *ji* 继 'continue, succeed' is also bound, because it cannot be used in a sentence as a stand-alone verb. In order for it to be used as a verb it must occur together with another morpheme within a word, such as in the words *jicheng* 继承 'inherit', *guoji* 过继 'adopt', *jixu* 继续 'continue', *chuji* 出继 'be adopted' or *jiren* 继任 'succeed someone (in a job)'.

It should be pointed out that while the categorization of morphemes as free or bound is a useful, valid distinction, it is not absolute, because it admits of different degrees of 'free'. Morphemes that are considered 'less free' are able to appear as free morphemes in fewer environments. For example, the verbal morpheme *ji* 计 'count, calculate, measure' is normally bound and so usually occurs as part of a two-morpheme word, as in the examples *jisuan* 计算 'calculate', *jiliang* 计量 'measure', *jishu* 计数 'count', *sheji* 设计 'design', *guji* 估计 'reckon' and *heji* 合计 'figure out', and cannot normally be used alone as a single-syllable verb. So, for example, *wo yao qu jisuan wode ban de chengji* 我要去计算我的班的成绩 (I want go calculate my class DE grade) 'I need to go calculate my class grades' is fine, but **wo yao qu ji wode ban de chengji* 我要去计我的班的成绩 is not acceptable. But there are certain limited contexts in which *ji* can be used as a free verb. So, for example, you can say *zhe fen gongzuo bu ji shijian* 这份工作不计时间 (this:CL work not count time) 'this (kind of) work is not figured by the hour'.

Another reason the categorization of morphemes as free or bound should not be viewed as absolute is that the distinction varies by *register*. Often a morpheme may be free in one register of language use and bound in another. Perhaps the best example of this is the difference between oral and written language. For example, the morpheme *gou* 购 'buy' may be used as a free verb in written language, as in the example *Wei baozhang nin shunchang gou piao, qing xiazai anzhuang genzhengshu* 为(保障您)顺物购票, 请下载安装保证书。(for safeguard you smoothly buy ticket please download install certificate) 'To safeguard your ticket purchase, please download and install the certificate'. In the spoken register, however, *gou* 购 must be accompanied with another morpheme as part of a bisyllabic word (e.g., *goumai* 购买 'buy-buy' or *gouwu* 购物 'buy-thing' 'buy things') to be used as a verb. This sort of a register difference is also seen in classical and modern Chinese, since morphemes are much more likely to be free in the classical than in the modern language. For example the noun *guo* 国 'country', was a free morpheme in classical Chinese, as seen in the example from Mencius *guo zhi ben wei jia* 国之本为家 (country MOD base for family) 'the foundation of the country is the family', but must occur in a bisyllabic form *guojia* 国家 (country-family) 'country' to be used as a noun in the modern language.

20.1.2 Content Versus Function

The second basic characteristic of a morpheme is whether it is *content* or *function*. A *content* morpheme is one that has an intrinsic nominal, verbal, or adjectival meaning of its own. A *function* morpheme in contrast is one that carries relatively little of its own intrinsic meaning but rather serves to mark some kind of a grammatical property or grammatical relationship among elements within the grammar. The distinction between content and function morphemes is one that has existed for a very long time in Chinese linguistics, embodied in the notions *shi* 实 'real' and *xu* 虚 'empty', with the Chinese terms for content and function morpheme being respectively *shizi* 实字 'real-character' and *xuzi* 虚字 'empty-character'. The function/content distinction is also very familiar in linguistics in general, since many language phenomena are explained with reference to this construct. But, as with the categorization of morphemes as free or bound, viewing the content/function dichotomy as absolute may be misleading, as it behaves more like a continuous rather than discrete relation, embodying the notion *cline* (Hopper and Traugott 1993:6-7). For our purposes, this means that while most Chinese morphemes can be viewed as content or function, there are bound to be cases where that decision will involve a gray area.

20.1.3 Morpheme Part of Speech

A salient property of most Chinese content morphemes is that they have fairly clear *part of speech* (i.e., grammatical *form class*) identities, meaning that content morphemes

usually have default identities as nouns, verbs, adjectives, and so on. But many are capable of having multiple part-of-speech identities, so for example the morpheme *bao* 包 can mean the noun 'package' or the verb 'pack/wrap', with neither its verb or noun sense being an obvious candidate as the morpheme's basic underlying part of speech, because the two meanings are fairly evenly balanced. The same is true for the morphemes *xue* 学 (meaning both 'field of study' and 'to study'), *suo* 锁 (meaning both 'lock' and 'to lock'), *liu* 流 (meaning both 'current' and 'to flow'), and *pai* 排 (meaning both 'row' and 'to arrange in a row').

However, most Chinese morphemes do have a basic, "default" speech identity and so can be considered as underlyingly belonging to a given form class. To give some examples, the morphemes *tu* 土 'earth, dirt', *tian* 天 'sky', *huo* 火 'fire', *dan* 蛋 'egg', *lu* 路 'road', and *bei* 杯 'cup' are all unambiguously nouns, and *kan* 看 'see, read', *peng* 碰 'bump', *kuā* 跨 'straddle', *ku* 哭 'cry', *zhao* 找 'look for', and *la* 拉 'pull' are all unambiguously verbs.

It is also worth pointing out that a morpheme's part of speech is generally clearer if it is a free morpheme. This is because the definition of "free" is "ability to stand alone in a form class slot" and so a morpheme's part of speech obviously has to be clear before it can be used in an utterance. That said, it is still true that morphemes usually have clear form class identities even when they are bound. For example, the morpheme *zhuo* 桌 'table' is bound, but native speakers know it is a noun because of the meaning it contributes in the word contexts in which it appears (e.g., *zhuozi* 桌子 'table', *shuzhuo* 书桌 'desk', *canzhuo* 餐桌 'banquet table', *zhuoshang* 桌上 'table top', *zhuobu* 桌布 'tablecloth', and *zhuodeng* 桌灯 'table lamp').

20.1.4 Connecting Free/Bound with Content/Function

Given that Chinese morphemes are classifiable according to their [\pm free] and [\pm content] values, such a classification system results in four possible morpheme types: if a morpheme is free and content, it is a *content word*; if it is free and function, it is a *function word*; if it is bound and content, it is a *bound root*; and if it is bound and function, it is an *affix*.² Each of these four morpheme types has specific properties, which we discuss in turn.

20.1.4.1 Content Words

Content (open-class) words are simply single-syllable major class items (nouns, verbs, and adjectives) such as *shu* 书 'book', *zuo* 坐 'sit', and *gao* 高 'tall'. The concept of the content word has existed for centuries in Chinese linguistics (实词 *shící* 'real-word'), and so its utility as a word formation primitive in Chinese comes as no surprise.

20.1.4.2 Function Words

Function words (*xuci* 虚词 'empty-word') are the familiar morphemes that occur freely in Chinese sentences, performing a variety of grammatical functions. Some examples are *de* 的 'attributive marker' (the most common word of any type in Chinese), *le* 了

'sentential aspect marker', *ba* 把 'direct object marker', *he* 和 'and', *jiu* 就 'then', *bei* 被 'passive marker', *dan* 但 'but' (more commonly seen in its two-syllable form *danshi* 但是), and *ne* 呢 'noun phrase question particle'.

Single-syllable function words do participate in the formation of longer function words, as the following examples demonstrate: *danshi* 'but', *suiran* 虽然 'although', *suoyi* 所以 'therefore', *yinwei* 因为 'because', *buguo* 不过 'however', *ruguo* 如果 'if', *zhuyu* 至于 'inasmuch as', *raner* 然而 'although', *ergie* 而且 'therefore', *eryi* 而已 'that's all', *bingqie* 并且 'furthermore', *yinci* 因此 'so', *guoran* 果然 'consequently', and *ruhe* 如何 'how'. However, they do not participate in word formation as productively as the other Chinese morpheme types, due to their status as closed-class items, so we do not discuss their word-forming properties in detail.

20.1.4.3 Bound Roots

Bound roots—bound content morphemes—constitute the largest class of morphemes in Chinese. This is also a very large class in other language families (e.g., the Romance and Slavic languages), but it is often overlooked because it is a relatively small set in English. Some examples of bound roots in Chinese are *guo* 国 'country', *shi* 驶 'drive', *nao* 脑 'brain', *xiang* 享 'enjoy', and *qi* 椅 'chair'.

20.1.4.4 Affixes

Affixes are morphemes that are bound and functional. There are two classes of affix in Chinese, *derivational affix* and *inflectional affix*. They have different characteristics, with the basic difference being that inflectional affixes do not form new lexemes; that is, they only minimally add meaning to words and also have an intimate relationship with syntactic processes. Some examples of inflectional suffixes are *-le* 了 'verb aspect suffix', *-men* 们 'plural suffix', and *-guo* 过 'verb aspect suffix'. Derivational morphemes, on the other hand, derive new lexemes and often create a word with a different grammatical form class category. Examples of derivational affixes are *-tou* 头 'nominal suffix', *-hua* 化 'verbal suffix', *-xing* 性 'nominal suffix', *-er* 儿 'nominal suffix', *-fu* 复 'verbal prefix', *a-* 阿 'nominal prefix', and *wu-* 无 'verbal prefix'. Other differences between derivational and inflectional affixes are that derivational affixes may have a meaning across contexts that is variable and somewhat unpredictable, and they may attach to either free words or bound roots. Inflectional affixes on the other hand have a consistent meaning across contexts and may only suffix to free morphemes (i.e., words).

20.2 ASSEMBLING THE MORPHEMES

Now let us consider what happens when you combine words, bound roots, and affixes to form larger words. When these morpheme types are put together to make larger words, because these words are composed of two or more morphemes, they are called *complex*. These complex words have certain properties.

First, Chinese complex words always have a form class identity (i.e., a part of speech). Determining the form class identity of a complex Chinese word is relatively straightforward: whatever syntactic form class slot a given word—regardless of its internal composition—is able to appear in, that is precisely the form class identity of that complex word. This is a matching process of sorts: the syntax requires an element with a certain form class identity to fill a grammatical slot, and the item the speaker selects from the lexicon to fill that slot is an element that the speaker knows possesses that identity. So a multisyllabic word can have the identity of, for example, a noun or verb, and the identity of the internal component syllables can be virtually anything. This fact is nicely demonstrated by Huang (1997: 264), who shows that the relationship between the identity of a complete multisyllabic word and the identity of its internal constituents can range from a close match to no relationship whatsoever. When the form class identity of the word and the form class identity of one of its constituents is the same, it involves the notion 'head of a word':

20.2.1 A Note on the Notion of 'Head'

In morphology, the head of a word can be defined as that part of a word to which inflectional rules apply (Zwicky 1985). Using that definition, the Chinese resultative verb *kan-jian* 看见 (look-see) 'see' is left-headed, not only because the form class of the left-hand morpheme *kan* is the same as the form class of the larger word but also because that left-hand morpheme is the point of inflection with the potential affix *-de* 得 'obtain' in yielding the potential form *kan-de-jian* 看得见 (look-obtain-see) 'able to see'. As we shall see in the sections that follow, this notion of word head allows us to account for many morphological operations that apply to complex Chinese words.

20.3 ASSEMBLING THE MORPHEMES: COMPLEX WORDS

Three different types of complex words result when words, bound roots, and affixes are combined: *compound words*, *bound root words*, and *affixed words*, with affixed words further subdivided into *derived words* and *inflected words* (Packard 2000: 81). We discuss these complex word types, categorized by their part of speech, in the sections that follow.

20.3.1 Compound and Bound Root Words

A compound word is a word that is composed of two words (i.e., two free morphemes). A compound word can be any part of speech (nouns, verbs, adjectives, prepositions,

etc.) though here we restrict our discussion to nouns and verbs. Chinese has a lot of compounds, but if compounds are defined traditionally as complex words composed of two free words, then most complex words in Chinese are in fact not compounds as received wisdom would have it. That honor instead goes to the next category, bound root words.

A bound root word is a word that is composed of a bound root and a free morpheme (word) or two bound roots. This is the largest class of words in Chinese, if only because most Chinese morphemes are bound roots: they are content morphemes that cannot stand alone as words. Other than that, bound roots do not have any special, distinctive properties. Their distribution is exactly the same as compound words, so anything compound words can do, bound root words can do as well. The following are some examples of complex noun words composed from free words (compounds) and some examples of words containing bound roots (bound root words).

20.3.1.1 Compound and Bound Root Nouns

Note that in the case of bound root words, only one member needs to be bound.

- noun-noun compound nouns: 冰山 ice-mountain 'iceberg'; 火车 fire-vehicle 'train'
- noun-noun bound root nouns: 电脑 electricity-brain 'computer'; 轮椅 wheel-chair 'wheelchair'
- noun-verb compound nouns: 事变 affair-change 'incident'; 锅贴 pot-stick 'potsticker'
- noun-verb bound root nouns: 电视 electricity-view 'television'; 壁挂 wall-hang 'wall hanging'
- verb-noun compound nouns: 锣鼓 wave-drum 'kind of toy'; 算盘 calculate-plate 'abacus'
- verb-noun bound root nouns: 租金 rent-gold 'rent'; 住房 live-house 'residence'
- verb-verb compound nouns: 烧卖 burn-sell 'kind of snack'; 动作 move-do 'movement'
- verb-verb bound root nouns: 研究 study-research 'pedant'; 构造 construct-make 'structure'

20.3.1.2 Compound and Bound Root Verbs

The following are examples of complex verb compounds and bound root words. As with the bound root nouns above, bound root verbs only require one member to be bound.

- verb-verb compound verbs: 借用 borrow-use 'borrow'; 缩写 shrink-write 'abbreviate'
- verb-verb bound root verbs: 解决 release-decide 'solve'; 分享 divide-enjoy 'partake'
- verb-noun compound verbs: 闹鬼 make-noise-ghost 'haunt'; 开刀 open-knife 'operate on'
- verb-noun bound root verbs: 担心 carry-heart 'worry'; 动员 move-person 'mobilize'
- noun-verb compound verbs: 瓜分 melon-divide 'to partition'; 毒杀 poison-kill 'to poison'
- noun-verb bound root verbs: 沟通 ditch-transmit 'communicate'; 彩排 color-arrange 'dress rehearsal'

noun-noun compound verbs: 左右 left-right 'to control'; 鱼肉 fish-meat 'to oppress'; noun-noun bound root verb: 物色 thing-color 'choose'; 云雨 yunyu cloud-rain 'to have sex'

20.3.2 Affixed Words

An affixed word is a word that contains either a derivational affix or an inflectional affix. An affixed word that contains a derivational affix is a *derived word*, and an affixed word that contains an inflectional affix is called an *inflected word*.

20.3.2.1 Derived Words

A derived word is a word that contains a derivational affix. There are countless derived words because many Chinese words are formed by adding a derivational prefix or suffix. Some examples of derivational affixes are *di-* 第 'ordinalizer', *fei-* 非 'not', *fu-* 复 'again', *re-*, *wu-* 无 'without', *-zi* 子 'nominalizer', *-tou* 头 'nominalizer', *-xing* 性 'nature', *-ness*, *-ity*, *who-*, *-hua* 化 'verbalizer', *-ize*, *-ify*, *-er* 儿 'nominalizer', *-xing* 性 'nature', *-ness*, *-ity*.

Derivational affixes, unlike inflectional affixes discussed later, may attach to a word, a bound root, or another affix. Also, derived words have the distinctive property that their form class is often determined by the derivational affix that created them. Other than that, the distributional characteristics of derived words are no different from bound root words or compound words, so virtually anything compound words and bound root words can do, derived words can also do. Examples of derived words follow.

Derived nouns include prefixed nouns, such as *afei* 阿飞 (AFF-fly) 'hooligan', *age* 阿哥 (AFF-brother) 'brother', *ahun* 阿混 (AFF-confuse) 'muddlehead', and suffixed nouns, such as *pianzi* 骗子 (cheat-AFF) 'cheater'; *tuzhe* 读者 (read-AFF) 'reader', *shoucangjia* 收藏家 (receive-collect-AFF) 'collector', *luanzi* 乱子 (chaos-AFF) 'disturbance', *renr* 人儿 (person-AFF) 'dear' person.

Derived verbs include prefixed verbs, such as *fuhuo* 复活 (AFF-live) 'resurrect', *faxian* 复现 (AFF-appear) 'reappear', *fufa* 复发 (AFF-occur) 'relapse', *fuhun* 复婚 (AFF-marry) 'remarry', *wushi* 无视 (AFF-view) 'disregard', and suffixed verbs, such as *dianhua* 电化 (electric-AFF) 'electrify', *huohua* 火化 (fire-AFF) 'cremate', *honghua* 红化 (red-AFF) 'reddened', *qihua* 汽化 (vapor-AFF) 'vaporize'.

20.3.2.2 Inflected Words

An inflected word is a word that has an inflectional affix. Although the number of inflectional suffixes is exceedingly small in Chinese, the number of inflected words is large, due to the productivity of the inflection process. In other words, the token frequency of inflected words is high even though the type frequency of inflectional affixes is low, because inflection is a very common process and because there are many different words that take inflectional suffixes. Inflected words are unlike the three other word types in that they may only be created by modifying a form that already has the identity of *word*. Therefore inflected words are only formed by adding a suffix to what we would consider a "preexisting" word.

20.3.3 Inflection as a Morphological Process

Inflectional suffixation is generally taken to be a morphological process, albeit one that is closely related to syntax. According to theories of morphological inflection, inflection operates either on the head of a word or on the entire word. When inflection applies to the word head, it applies word internally, and when it applies to the whole word it applies word externally, that is, on the right edge of the word. Because Chinese verbs are left-headed and Chinese nouns are right-headed (see Section 20.2.1), this means that two-syllable Chinese verbs inflect either on the right edge of the left syllable (the head) or on the right edge of the word, whereas two-syllable Chinese nouns can inflect only on the rightmost edge of the word, because that right edge is ambiguously either the right edge of the right syllable or the right edge of the whole word, as we shall see in examples such as *xueshengmen* 学生们 (student-PL) 'students' later.

20.4 VERB INFLECTION

Verb inflection in Chinese consists of three related but separate phenomena. First there is a small set of simple, regular inflectional endings that suffix to most simple or complex verbs. The second is the affix (*-de* 得 or *-bu* 不) that operates on resultative verb compounds. The third is A-not-A question formation, which in Mandarin is considered a morphological inflection process. These three types of verb inflection apply to different classes of verbs, and the part of the verb upon which the inflection is realized varies by verb class.

20.4.1 Regular Verb Inflection

There are three regular verb inflectional suffixes in Mandarin: *-le* 了 indicating perfective aspect, *-guo* 过 marking experienced aspect, and *-zhe* 着 indicating continuing aspect. These inflectional suffixes are considered "regular" because they can suffix to virtually any verb, whether single-syllable or multisyllable. To give some simple single-syllable examples, in the basic sentence *ta chi mian* 他吃面 (he eat noodle) 'he eats noodles', the verb *chi* can be inflected with 了, 过 and 着 respectively to yield *ta chi-le mian* 他吃了面 (he eat-asp noodle) 'he ate noodles', *ta chi-guo mian* 他吃过面 (he eat-asp noodle) 'he has eaten noodles', and *ta chi-zhe mian* 他吃着面 (he eat-asp noodle) 'he is eating noodles'.

These regular inflectional suffixes may also inflect multisyllabic verbs. For example: *Tamen taolun-le nage wenti* 他们讨论了那个问题 (they discuss-asp that-CL problem) 'They discussed that problem', *Tamen taolun-guo nage wenti* 他们讨论过那个问题 (they discuss-asp that-CL problem) 'They have discussed that problem before', *Tamen*

taolun-zhe nage wenti 他们讨论着那个问题 (they discuss-asp that:CL problem) 'They are discussing that problem.'

There is an additional suffix—the resultative extent suffix *-de* 得—that may be added to the list of simple verb affixes, but it is restricted to inflecting a verb only when it is followed by a syntactic result complement. For example, *ta pao-de bi shei dou man* 他跑得比谁都慢 (he run-asp compare who all slow) 'he runs slower than everyone.' For a two-syllable example, *tamen taolun-de feichang renao* 他们讨论得非常热闹 (they discuss-asp very noisy) 'they discussed it to the point of getting very boisterous.'

20.4.2 Resultative Verb Inflection

Resultative verbs are a class of complex verbs in which the second verb component (V_2) indicates the result of the action of the first verb component (V_1). The potential morphemes *-de* 得 or *-bu* 不 (meaning 'able to' and 'not able to', respectively) are affixed word internally, that is, to the leftmost member V_1 (i.e., the head) of the complex verb, and indicate the ability or inability of the predication expressed by the complex verb to take place. The V_1 of resultative verbs in general represents the open set of Mandarin transitive verbs, and V_2 is a usually nontransitive, often "stative" verb that indicates the result of the predication of V_1 . V_1 is almost always a free morpheme (i.e., a word), while V_2 can be either free or bound.

Resultative verbs may be divided into three general classes based on the nature of V_2 . The first is a large class we may call *stative* resultatives, in which V_2 is a stative verb. The second class may be called *directional* resultatives, in which V_1 is a verb of motion, and V_2 is a verb of directional motion. The third class is *attainment* resultatives, which have a rather large but nonetheless closed class of V_2 endings. Each of these three classes has an "open" subset (those that are productively created and have predictable meanings) and a "closed" subset (those that fit the grammatical criteria but are listed in the lexicon due to semantic unpredictability).

20.4.3 A-not-A Verb Inflection

A-not-A question formation is considered an inflectional process in Mandarin (see, e.g., Huang et al. 2009:252–254). The morphological result of this process involves the suffixation of the negative morpheme *-bu* 不 to a verb, operating either on the entire verb or, in the case of a complex verb, on the left-hand member (i.e., the head). This suffixation operation is followed by the reduplication (copying) of the domain of suffixation to the right of the negative suffix. For example, *ni renshi ta* 你认识他 (you acquaint:recognize him) 'You know him' > 你认识不认识他? *ni renshi bu renshi ta* (you acquaint:recognize-not-acquaint:recognize him) 'Do you know him?' > 你认不认识他? *ni ren bu renshi ta* (you acquaint-not-acquaint:recognize him) 'Do you know him?' The A-not-A question

inflection operates on simple single-syllable verbs and complex [VV] or [VN] verbs, but does not operate on resultative verb compounds.

20.5 NOUN INFLECTION

Inflectional affixation on Mandarin nouns is sparse, whether on single- or two-syllable words. The only noun inflectional suffix in Mandarin is the very common human plural suffix *-men* [ŋ]. The human plural suffix *-men* suffixes to virtually all single- or multisyllable human nouns and pronouns. Some examples are *wo* 我 'I' > *women* 我们 (I-PL) 'we', *ren* 人 'person' > *renmen* 人们 (person-PL) 'people', *xuesheng* 学生 'student' > *xueshengmen* 学生们 (student-PL) 'students', *jianshezhe* 建设者 (build-design-one) 'builder' > *jianshezhe men* 建设者们 (build-design-one-PL) 'builders'.

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NOTES

1. To be sure, many of those 8,500+ entries do represent only one morpheme, because they are relatively rare or are used only in specialized and classical contexts.
2. Of course *bank* is also a word in English because it is a free morpheme.
3. Clitics are also categorized as bound function [-free and -content] morphemes; the difference between clitics and affixes is that affixes are bound to other morphemes, while clitics are bound to syntactic constituents, because they modify larger syntactic structures (e.g., phrases).

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CHAPTER 21

TENSE AND ASPECT IN
MANDARIN CHINESE

MEICHUN LIU

21.1 THE ENGLISH CONCEPT OF TENSE

In traditional terms, “tense” refers to the time of the reported event in relation to the speech time, while “aspect” refers to the way the reported event is perceived. Givón (1993:148) defines tense as the relation between two points along the linear dimension of time—the time of speech and the time of event. The time of speech serves as the default or universal reference point for describing the event time. Thus an event may be in the past (prior to the event time), in the future (after the event time), in the present (right at the event time), or habitual (always, timeless):

- (1) English tense marked by verb forms:
 Past: The dog ran to the park.
 Future: The dog will run to the park.
 Present: The dog is running to the park.
 Habitual: The dog always runs to the park.

Figure 21.1 is a schematic representation of the tense relations.

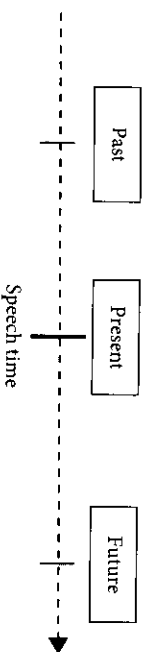


FIGURE 21.1 The schematic representation of tense relations

21.2 CHINESE HAS NO
GRAMMATICALIZED TENSE

As shown, English marks tense relations on the verb; the past tense is marked typically by the verb ending *-ed* or by other irregular forms. But Chinese lacks such a grammaticalized way of expressing tense on the verb (Chao 1968; Li and Thompson 1981; Sun 2006). Instead, Chinese expresses tense using other lexical words such as time expressions or relies heavily on contextual information to help draw inferences about event time. In the following examples, (2) illustrates that the form of the verb stays the same no matter what tense it refers to; (3) shows how context may help indicate the time of the reported event:

(2) Explicit time expressions:

- a. 他昨天回来。
ta zuotian huilai.
 he yesterday come-back
 ‘He came back yesterday.’

- b. 他今天回来。
ta jintian huilai.
 he today come-back
 ‘He came back today.’

- c. 他明天回来。
ta mingtian huilai.
 he tomorrow come-back
 ‘He will come back tomorrow.’

(3) Contextual inference

- A: 他为什么没来上课?
ta weisheme mei lai shangkan?
 he why not come attend-class
 ‘Why didn’t he attend the class?’
- B: 他家里有事。
ta jia li you shi.
 he family inside have matter
 ‘There was something in his family.’

In (2a–c), three different time words are used, but the verb form *huilai* 回来 ‘return’ remains invariant with the different time frames. It shows that Chinese does not mark

tense on the verb. In the short exchange in (3), the question from A has set a clear time frame by asking about an “observed” absence *ta meilai shangke* 他没来上课 ‘He didn’t come to class’ that must have happened in the past before the utterance time. The answer by B is then logically limited to the “past” time frame as it expresses a causal factor to the observed absence—a fact in the past. These examples illustrate one important fact about Chinese: It does not require explicit formal marking of tense in a sentence. However, tense is to a certain degree correlated with aspectual distinctions that are formally marked, as is explained in the following.

21.3 ASPECT AS REALIZED IN ENGLISH

Aspect is a very different notion from that of tense. Aspect profiles a particular viewpoint for describing the event itself. In English, the same event (e.g., He wrote an article last night) may be described in two different ways, highlighting two different perspectives of viewing the event: progressive versus perfective, as exemplified in the following:

(4) Two distinct viewpoints

a. Progressive viewpoint:

He was writing a book. ← as an ongoing, unbounded event

b. Perfective viewpoint:

He has written an article. ← as completed prior to speech time

Again, English aspect is marked formally and explicitly on the verb. The verb form *BE V-ing* signals the progressive aspect, while the form *BE-V-en* signals the perfect aspect. Similar distinctions in aspectual viewpoint can also be found in Chinese, but with different formal devices (Rohsenow 1978; Chen 1979; Teng 1979; Chan 1980; Chang 1986).

21.4 ASPECTUAL DISTINCTIONS IN CHINESE: THE PERFECTIVE

Chinese makes a distinction between perfective and nonperfective event views. The perfective aspect is first introduced in this section and the imperfective in Section 21.5. There are two commonly recognized perfective markers in Chinese: the simple perfective *LE* and the experiential perfective *GUO*.¹ Both markers follow the verb as verbal suffixes to express the event as terminated and bounded by a reference time, but the use of *guo* further implies discontinuity, which is not required in the use of *le* (Ma 1977; Spanos 1979a, 1979b; Sun 2006). The morpheme *le* serves as the default marker for presenting the simple perfective viewpoint in taking an event as bounded and actualized, as illustrated in example (5). The event of “running” and “reading three books” are viewed as

actualized and terminated prior to the time of the utterance and thus marked by the perfective suffix *le*.

(5) a. 我跑了很久。

wo pao-le hen jiu

I run-LE very long

‘I ran for a long time.’

b. 我看了三本书

wo kan-le san-ben shu

I read-LE three-CL book

‘I read three books.’

Note that although the perfective aspect normally implies completion, an event marked by the Chinese perfective *le* is not necessarily completed or has reached its natural endpoint. According to Smith (1991:107–108), the perfective *le* conveys termination for all nonstative events, but termination does not always guarantee “completion” (i.e., the attainment of a final endpoint). The notion of *completion*, Smith further notes, can be unequivocally expressed by a set of optional, independent morphemes known as resultative verb complements (RVC), such as *wan* 完 ‘finished’. Example (6) uses the perfective *le* to mark the event of writing a letter but does not necessarily entail that the writing was completed, as further contrasted in the second half of the utterance:

(6) 我昨天写了信，可是没写完。

wo zuotian xie-le xin, keshi mei xie-wan.

I yesterday write-LE letter but not write-finish

‘I wrote a letter yesterday but didn’t finish it’

From the example, we see clearly that termination and completion are two independent notions in Chinese. Termination or boundedness is expressed by the perfective marker *le*, while completion is guaranteed by adding a resultative complement (e.g., *wan* ‘finished’) to the verb (Lu 1975). A better way to interpret Smith’s notion of termination may be the notion of “actualization.” The action has been done and realized in real time. To further clarify the perfective viewpoint, more detailed accounts of the two perfective markers *le* versus *guo* are given in the following subsections.

21.4.1 The Perfective *Le*

As already mentioned, the default perfective marker in Chinese is *le*. Smith (1991:244–345) made it clear that *le* always follows the verb and presents a simple, closed event, as it may occur with any kind of dynamic, nonstative verbs:

- (7) a. 他们昨天在公园里吵了一架 (Activity V)
tamen zuotian zai gongyuan-li chao-le yi-ji
 they yesterday ZAI park-in quarrel-LE one-fight
 'They quarreled yesterday in the park.'
- b. 我昨天写了一封信 (Accomplishment V)
wo zuotian xie-le yi-feng xin
 I yesterday write-LE one-CL letter
 'I wrote a letter yesterday.'
- c. 李四忽然咳嗽了 (Semelfactive V)
Lisi huran kesou-le
 Lisi suddenly cough-LE
 'Lisi coughed suddenly.'
- d. 张三在中午到了山顶 (Achievement V)
Zhangsan zai zhongwu dao-le shanding
 Zhangsan at noon arrive-LE hilltop
 'Zhangsan reached the hilltop at noon.'

All these events involve some sort of dynamic action. They are functionally compatible with the perfective *le* as they can be viewed as actualized and terminated by a reference time, normally the speech time or other specified time.

21.4.2 The Temporal Schema of the Perfective-*le*

The perfective-*le* presents closed, nonstative situations. When it is used, it conveys an arbitrary final point, not necessarily the natural final point of the event. Thus the temporal schema of the perfective-*le* may be represented as follows (Smith 1991, 1994):

- (8) Temporal schema for the perfective-*le*
 I.....F^{Arbitrary}
 / / (RVC)

I and F refer to the initial and final endpoints of the situation; single-stage events are considered to have simultaneous endpoints. The notation F^{Arbitrary} indicates the final endpoint may be arbitrary; not necessarily the natural endpoint; the notation RVC indicates the possibility of additional specification of the ending state with RVC.

21.4.2.1 Perfective-*le* Versus Sentence-Final *LE*

It is commonly noted that Chinese has two different uses of *le*. Besides the perfective suffix -*le* as introduced earlier, there is a sentence-final discourse marker that has exactly

the same form *LE* but performs a different function. As a discourse particle, *LE*² always occurs at the end of a sentence, marking the reported event or situation as "relevant" to the current context. According to Li and Thompson (1981:238), this sentence-final *LE* is used to mark a "currently relevant state" and is sometimes referred to as the "perfect" marker *LE*. In the following example, the two different *le*'s occur in the same sentence:

- (9) 我已经吃了晚饭了。
wo yijing chi-le wanfan LE
 I already eat-LE dinner LE
 'I have already eaten dinner, (which is relevant to the current situation).'

The first *le* is the postverbal, perfective *le* that asserts the event of "eating dinner" as bounded and terminated prior to the speech time, while the second *LE* is the sentence-final particle that marks the event as currently relevant, say, as a reply to the previous question "Are you hungry?" This example can then be seen as a relevant answer to a previously asked question, with the perfective suffix *le* asserting the actualization of the action and the discourse particle *LE* marking the utterance as currently relevant and relating it to the immediate context.

21.4.2.2 The Use of *LE* with Stative Predicates

The functional distinction between the perfective suffix *le* and the discourse particle *LE* can be further clarified with regard to stative predicates. As Smith (1991:110) noted, just like Russian and Navajo, the Chinese perfective suffix *le* is normally not available to stative predicates. The reason is that states tend to be temporally stable, durative, non-bounded, and nontelic and thus may not be expressed with the perfective *le* that requires a clear point of termination or boundary.

Instead, stative predicates may appear with the sentence-final particle *LE* in Chinese, marking a newly arising state, as illustrated in (10):

- (10) a. 他病了
ta bing LE
 he sick LE
 'He got sick.'
- b. 他生气了
ta shengqi LE
 he angry LE
 'He got angry.'
- c. *他聪明了
ta congming LE
 he intelligent LE
 **'He became intelligent.'

d. 你这样说就聪明了!

ni zheyang shuo jiu congming LE

you this-way say then smart LE

'You got smart when saying so.'

Such sentences can be interpreted as currently relevant states with a derived telic sense (Li and Thompson 1981). The use of *LE* presents the coming about of a new state lexically referred to by the predicate. In marking such an inchoative state, the particle *LE* tends to co-occur with temporary, prone-to-change states, such as *bing* 'being sick' in (8a) or *shengqi* 'being angry' in (8b), rather than inherent, time-stable, or unchangeable properties, such as *congming* 'being smart/intelligent' in (8c) (cf. Smith 1991:110). However, given a proper context as in (8d), the use of *LE* may coerce an inchoative reading into the otherwise stable property, signaling a currently relevant state, that is, a conceivable change of state contingent on a given context.

In sum, Chinese has two different uses of *LE*. The perfective, verbal suffix particle *le* is attached to the verb stem asserting the realization and termination of the action denoted by the verb. In contrast, the perfect, sentence-final particle *LE* serves to mark an event or situation as currently relevant in discourse. It thus functions as a discourse marker in profiling the relevance and contingency of the current utterance to the immediate context. When a stative predicate is involved, *LE* can serve to present the speaker's view of a conceivable change of state as currently relevant. Although sharing the same morphological form, the two different *LE*'s come from two different sources historically and are thus functionally distinct and occupy different syntactic positions. Their co-occurrence may render the surface pattern exemplified in (9): Subject Verb-*le* Object *LE*.

21.4.3 The Experiential Marker *Guo*

The other aspectual marker that conveys a perfective sense is the affix *-guo* 过. It denotes a past, discontinued experience that occurs prior to a reference time. Different from the perfective *-le*, events marked by *-guo* are typically completed and discontinued in the current time. Given the obligatory feature of discontinuity, *-guo* is often used to refer to a past experience, the final state of which no longer obtains. It thus profiles the "experience" of having engaged in an activity or participated in a situation. For example, the sentence with *-guo*, *ta kai-guo feiji* 他开过飞机 (he fly-GUO airplane) can be translated most appropriately as 'He had the experience of flying an airplane' or 'He (at some point) experienced flying an airplane.'

Smith (1991:348) made it clear that the main feature of *-guo* is that it presents a discontinuity with the present or other reference time. The discontinuity invokes both temporal location and situation type: the event no longer holds in time or place. The contrast between *le* and *guo* is that *le* gives no information beyond the final point of a situation while *guo* implies that the situation is discontinued with an interval between the event time and the reference time. In the following examples, the same verb predicate may give different readings about

the situation. Example (11a) indicates a discontinuity with the present and thus the situation "going to Hong Kong" no longer holds, whereas (11b) does not have such an implication:

(11) a. 他们上个月去过香港

tamen shang-ge yue qu-guo Xianggang

they last-CL month go-GUO Hong-Kong

'Last month they went to Hong Kong (and they are no longer there).'

b. 他们上个月去了香港

tamen shang-ge yue qu-le XiangGang

they last-CL month go-LE Hong-Kong

'Last month they went to Hong Kong (they may still be there).'

Can a verb occur with both *-le* and *-guo* in a sentence? The answer is yes. As shown in the following, a verb may take both the experiential *-guo* and the perfective *-le*, in the order of *-guo* preceding *-le*, indicating a past experience that has been actualized, terminated, and discontinued prior to the current speech time:

(12) 他们上个月去了香港

tamen shang-ge yue qu-guo-le XiangGang

they last-CL month go-GUO-LE Hong-Kong

'Last month they went to Hong Kong. (They are no longer there).'

Semantically, *-guo* and *-le* complement and reinforce each other in marking the perfective viewpoint, with the additional specification contributed by the use of *-guo* in signaling a discontinued prior experience.

21.4.3.1 Temporal Specificity

The suffix *-guo* indicates that a past experience has happened, terminated, and discontinued prior to the reference time, but there's no indication of the specific occurring time of the experience. The discontinued experience marked by *-guo* can be in the remote or recent past. This is why Smith (1991:350) further noted that sentences with *-guo* may present a specific situation anchored in a time point or an indefinite situation that is unanchored temporally. The difference between the temporally specific and nonspecific uses of *-guo* is not grammaticalized: only contextual and pragmatic knowledge may help infer if it refers to a definite time span, as shown in the following (cf. Smith 1991:350-351):

(13) a. Temporally specific event with *-guo*

A: 你昨天吃过中国菜没有?

ni zuotian chi-guo Zhongguo cai meiyou?

you yesterday eat-GUO Chinese food not

'Have you had Chinese food yesterday?' (temporally specific)

B: 吃过

chi-guo

eat-GUO

'Yes, I have.' (Specific in time—yesterday)

b. Temporally nonspecific event with *-guò*

A: 你吃过中国菜吗?

ni chi-guo Zhongguo cai ma?

You eat-GUO Chinese food Q?

'Have you eaten Chinese food?' (temporally nonspecific)

B: 吃过

chi-guo

eat-GUO

'Yes, I have.' (sometime in the past)

Since there is no formal marking of temporal specificity with *-guo*, sentences that are ambiguous between the two readings can be constructed (Smith 1991:351):

(14) 我喝过酒了

wo he-guo jiu-le

I drink-GUO wine-LE

a. nonspecific: 'I have had alcohol (at some time before).'

b. Specific: 'I have drunk my drink of alcohol today.'

The past experience of drinking alcohol may be interpreted as occurring in a remote, unspecified time in the past or in a specified time span such as "today." This shows that the use of *-guò* is not meant to "report an event" situated specifically in a given time but to indicate that someone has "the experience" of having done something.

By profiling and linking a past experience to an experienter, the marker *-guò* is not normally used to "assert" the actualization of an event but to account for the experienter's prior history of experiences. This is an important characterization of *-guò*, since it may give rise to the contrast in the following example when expressing the grand event of Columbus's discovering the Americas (Ma 1977):

(15) a. 哥伦布发现过美洲大陆。

Gelunbu faxian-guo meizhou da-lu

Columbus find-GUO America big-land

b. 哥伦布发现了美洲大陆。

gelunbu faxian-le meizhou-da-lu

Columbus find-LE America big-land

'Columbus discovered the American continent.'

To report the event of Columbus's discovering the American continent, only (15b) is acceptable, since the perfective marker *-le* asserts the actualization of an event in its entirety, while *-guò* is not used to assert the happening of an event but to relate the event to the experienter.³

21.4.3.2 The Temporal Schema for the Experiential *-Guo*

The temporal schema of *-guo* is given in the following (Smith 1991, 1994). The use of *-guo* makes visible an interval from the initial point *I* of a situation to a subsequent stage *F*+1, which is after the final point *F*:

(16) The Mandarin *-guo* perfective viewpoint

I F_{Arbitrary} F+1

/ / /

I and *F* refer to endpoints of situations; *F*+1 indicates a change of state subsequent to *F*.

21.5 THE IMPERFECTIVE ASPECT

Contrary to the perfective viewpoint, the imperfective aspect presents an event as unbounded and ongoing from an internal vantage point (Teng 1979; Yeh 1990). Mandarin has two different markers to express the imperfective viewpoint: the preverbal *zai* and the postverbal *zhe*. The morpheme *zai* marks the progressive aspect, presenting a dynamic event as in the middle of its happening, while *zhe* marks a durative, stative situation that is meant to last as a resultative state.

21.5.1 The Progressive Marker *Zai*

Mandarin Chinese uses the morpheme *zai* in front of a verb to mark the progressive aspect, expressing an unbounded, ongoing event from a close proximity. Givón (1993:154–155) describes the progressive aspect as using a wide-angle lens to "zoom in" the event and placing the observer right at the scene. Such a narrow viewpoint is marked by the preverbal morpheme *zai*, as illustrated here:

(17) 他们在吃饭

tamen zai chifan

they ZAI eat meal

'They are eating a meal.'

The progressive marker *zai* precedes the verb and encodes a dynamic ongoing situation as in the middle of happening. As Smith (1991:357) observes, *zai* presents an internal interval of a durative situation and often has the connotation of temporary engagement in a telic activity:

(18) a. 他们在打球

tamen zai da qiu (Activity)

they ZAI play ball

'They are playing ball.'

b. 张三在写一封信

Zhangsan zai xie yifeng xin (Accomplishment)

Zhangsan ZAI write one-CL letter

'Zhangsan is writing a letter.'

21.5.1.1 Semantic Compatibility

The progressive *zai* is only compatible with durative processes that contain an internal interval. As Smith (1991:357) points out, no such interval is available internally for instantaneous events. That is why the progressive *zai* does not appear with verbs denoting an instant change, such as *ying* 赢 'win', *si* 死 'die', or *po* 破 'broken', as shown by the ungrammatical sentences in (19). When the progressive *zai* occurs with a repeated instantaneous act such as *qiao-men* 敲门 'knock at the door' as in (20), it renders the reading of an ongoing activity of repeated, multiple subevents (cf. Smith 1991:357-358):

(19) a. *他在赢赛跑

*ta zai ying sai pao

he ZAI win race run

'He is winning the race.'

b. *老王在死

*Lao Wang zai si

Old Wang ZAI die

'Old Wang is dying.'

(20) 小王在敲门

Xiao Wang zai qiao men

Little-Wang ZAI knock door

Little Wang was knocking at the door.'

By marking an event as ongoing and unbounded, the progressive *zai* occurs most typically with activity or accomplishment verbs that may be viewed from its internal vantage point as a temporarily existing stage. (The morpheme *zai* also denotes spatial existence.)

21.5.1.2 The Temporal Schema of Zai

According to Smith (1991:358), the temporal schema of *zai* may be represented as follows: *zai* presents an internal interval of a situation *S* that includes neither the initial point *I* nor the final point *F* and that does not precede *I* nor follow *F*. The interval has the [Stage] property.

(21) The Mandarin progressive *zai*

a. I.....F[+Stage]

/////

21.5.2 The Stative Marker Zhe

The other imperfective maker is the suffix *-zhe* that follows a verb and converts the predicate into a state. For example:

(22) 他坐着，我站着

ta zuo-zhe, wo zhan-zhe

he sit-ZHE I stand-ZHE

'He sits and I stand.'

The suffix *-zhe* in (22) focuses on the state as a result of sitting or standing. Smith (1991:358) characterizes *-zhe* as it "expresses an imperfective viewpoint that presents a continuous and stable situation without regard to endpoints." It typically profiles states of position and location, as illustrated in the following (Smith 1991:359):

(23) a. 墙上挂着几幅画儿

qiang shang gua-zhe ji zhang huar

wall on hang-ZHE several CL picture

'Several pictures are hanging on the wall.'

b. 他在床上躺着

ta zai chuang shang tang-zhe

he at bed on lie ZHE

'He lies on the bed.'

c. 门上写着四个字

men shang xie-zhe si ge zi

door on write-ZHE 4-CL character

'Four characters are written on the door.'

The use of *zhe* can thus be seen as highlighting a resultative state that may last for a reasonable duration. Given its function in marking a resultative state, it is further noted that *-zhe* only applies to stage-level (temporary, changeable) predicates but not to individual-level (permanent, intrinsic) predicates, as exemplified in (24) (from Smith 1991:359):

(24) a. 我们彼此深爱着, 彼此依赖着

women bici shen ai-zhe, bici yilai-zhe

we mutually deep love-ZHE, mutually rely-ZHE

'We deeply loved each other, and relied on each other.'

b. J. 已经与你隔着重洋

J. yijing yu ni ge-zhe chong yang

J. already from you separate-ZHE multiple oceans

'J. was already a million miles away from you.'

The verbs "love," "rely," and "separate" exemplify stage-level predicates. They encode relational or spatiotemporal stages of individuals. Citing Yeh (1990), Smith further illustrates that *-zhe* does not occur with individual-level stative predicates (1991:359-360):

(25) a. ??他一向诚挚着

??*ta yixiang chengzhi-zhe*

he always honest-ZHE

'He is always honest.'

b. ??他知道着这个答案

??*ta zhidao-zhe zhege huida*

he know-ZHE the answer

'He knows the answer.'

c. ??他聪慧着

??*ta conghui-zhe*

he intelligent-ZHE

'He is intelligent.'

In these examples, the inherently stative and durative predicates, "honest," "know," and "intelligent", all refer to relatively unchangeable or permanent properties of an individual and thus cannot be used with the state-converter *zhe*.

21.5.2.1 *The Backgrounding Function of -Zhe*

One more interesting point about the use of *-zhe* is that it may appear in a subordinate clause, expressing the temporal or positional background of the main event. As Smith (1991:360-361) points out, "the imperfective viewpoint has a backgrounding effect, 'freezing' a situation in progress or an ongoing state," as illustrated in the following:

(26) a. 他们坐着看报

tamen zuo-zhe kan bao

they sit-ZHE read newspaper

'Sitting, they read the newspaper.'

b. 骑着马找马

qi-zhe ma zhao ma

ride-ZHE horse seek horse

'Look for a horse while riding a horse.'

(Not doing something whole-heartedly)'

Given the stative nature of the imperfective aspect, the suffix *-zhe* may co-occur with the progressive marker *zai* in a durative, unbounded situation:

(27) A. 他在做什么?

ta zai zuo shenme

he ZAI do what

'What is he doing?'

B. 他在吃着饭。

ta zai chi-zhe fan

he ZAI eat-ZHE meal

'He is (in the state of) eating a meal.'

The progressive *zai* marks the ongoing event "eating" as an unbounded, temporary stage that is in the middle of happening; the durative state marked by *zhe*, on the other

hand, emphasizes the lasting, resultative state of eating. The two imperfective markers are semantically close to each other, though profiling different aspects.

21.5.2.2 Temporal Schema of *-zhe*

The temporal schema of the imperfective *-zhe* is given in (28) (Smith 1991, 1994). *Zhe* presents a durative moment or interval of a situation that includes neither its initial nor final endpoints and that does not precede the initial point. It provides a resultative focus and imposes the [+State] property to the interval:

(28) The *-zhe* viewpoint

I.....
 //[[[State]]]

21.6 CONCLUSION

In this chapter, the Chinese aspectual system is introduced in detail. While there is no grammatical distinction in tense marking, the distinction between perfective versus imperfective viewpoints is clearly marked in Chinese. For the perfective aspect, the default perfective suffix *-LE* marks an event as actualized and bounded by a reference time (typically the speech time), while the experiential suffix *-GUO* marks an event as a past experience that has been terminated and discontinued. As for the imperfective aspect, there are also two different markers used in Chinese: the progressive *ZAI* precedes a verb and marks the event as ongoing and unbounded, as viewed from a close proximity; the durative suffix *-ZHE* converts an event into a state by focusing on the resultant state as durative and ongoing. Unlike English, Chinese lacks grammaticalized marking of tense and does not distinguish on the verb form the differences of event time; it nevertheless employs distinct aspectual markers to express the perfective versus imperfective viewpoints of an event.

NOTES

1. A perfective sentence marked by *le* can be negated with the negator *mei* 没, which, in some sense, marks perfective negation:

Positive: 他吃了 ta chile. 'He ate.'

Negative: 他没吃 ta mei chi. 'He didn't eat.'

2. For ease of distinction, the postverbal perfective *le* is represented with lower-case letters as *le*, while the sentence-final particle *LE* that marks a currently relevant state is represented with upper-case letters as *LE*.

3. The contrast in (15) led Ma (1977) to conclude that *-guò* can only occur with repeatable events, since Columbus discovered the land only once. But (15a) with *-guò* would be perfectly fine as an answer to the question: 'What had Columbus discovered?'

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CHAPTER 22

CHINESE LEXICAL
SEMANTICS*From Radicals to Event Structure*

CHU-REN HUANG AND SHU-KAI HSIEH

22.1 INTRODUCTION

LEXICAL semantics was deemed peripheral in formal linguistics' early pursuit of a rule-based account of language since lexicon is viewed as the repository of idiosyncrasies and meaning is considered fuzzy and difficult to delineate. The papers collected in Levin and Pinker's (1992) *Lexical and Conceptual Semantics*, however, reestablished the central place of lexical semantics in linguistics based on the following two observations: lexicon is the repository of all linguistic information as well as the shared interface to all linguistic modules, and conceptual knowledge is represented in language through lexical conventionalization. The study of Chinese lexical semantics shares these two generalizations with a caveat: that the Chinese orthographical system encodes certain conventions of conceptualization. Hence, in this chapter, we pay special attention to the conceptual representation of Chinese characters and its interaction with lexical semantics, in addition to the universal topics of polysemy, semantic relations, and verbal semantics.

22.2 CHINESE ORTHOGRAPHY REFLECTS
CONCEPTUAL ORGANIZATION

Orthography has marginal relevance in formal linguistic theories, as it is a conventionalized secondary representation. The issue of how writing systems encode linguistic elements has rarely been studied in lexical semantics.

Sproat (2000) showed that it is possible to study orthographic systems linguistically and introduced the concept of *orthographically relevant level* (ORL), which is defined as the "level of linguistic representation encoded orthographically by a particular writing system." It is noted that the notion of ORL does not lead one to claim that orthographic object necessarily has a linguistic counterpart at the ORL; it is simply that "linguistic level of representation at which those *regular* correspondences are most succinctly stated" (Sproat 2000:10-14). We accord with Sproat on that point and propose that the ORL is the conventional representation of shared tacit linguistic knowledge. To study language as knowledge system, one must involve orthography as the explicitly expressed convention.

Sproat made convincing analyses of both phonology and morphology as ORL. For instance, the well-known phenomenon of loanword assimilation in alphabetic writing languages often involves maintaining the phonological system and the orthography of the target language as phonology is an ORL in these languages (e.g., ㄅ ㄆ ㄇ ㄉ, 'kechappu' in Japanese is borrowed from "ketchup"). Although phonology is the most obvious ORL in languages with alphabetical or syllabic writing systems, it is also applicable to character-based Chinese writing systems. For instance, guitar is rendered as *gitta* 结他 in Cantonese.

Semantics as an ORL, however, has not been seriously considered before. In Chinese, the so-called ideograph writing system is offset by the fact that most characters contain both a semantic part and a phonetic part. As psycholinguistic studies show that reading of Chinese characters does involve phonemic awareness (e.g., Tzeng et al. 1977), it is also often shown anecdotally that Chinese radicals do not form a well-defined taxonomy and have many exceptions. The questions thus posed are (1) If the abstract phonological level is orthographically relevant then why not the concrete semantic level? (2) What does it mean for semantics to be an ORL? Hence, in order to show that semantics is an ORL in Chinese, we need to show that there is a consistent and coherent semantic system corresponding to the radical-based writing system.

Our extensive studies of the Xu Shen's (121 CE) *Shuowen Jiezi* radical systems showed that all characters sharing the same radical also share the same semantic concept. An illustrative example of the knowledge system of radicals is shown in Figure 22.1. As seen, all the characters sharing the radical 口 fall into one of three groups: those pertaining to the organ *mouth*, those pertaining to *eating*, and those pertaining to *speaking*. It is hypothesized that radical semantics is event and experience based, similar to the *qualia structure* proposed by Pustejovsky (1995) (see the next section).

In sum, there are many important theoretical implications if semantics is indeed the ORL for Chinese writing system. On the one hand, the Chinese writing system offers direct evidence to the linguistic semantic system of the language. On the other hand, the semantic relations attested in the system may shed light on the range of possible semantic changes in the language.

in particular), **participating**, **descriptive (state/manner)**, and **agentive**. This can be illustrated as follows:

物质 (**formal**) : (专名 proper name、大小 size、颜色 color, etc) e.g., 银, 白金也 (yinz: 'a white gold/metal').

组成 (**constitutive**) (部位 parts、成分 component elements) e.g., 睫, 目旁毛也 (jiez: 'hair by the eye')。磊, 众石貌 (leiz: 'a heap of stones')。

功用 (**telic**) e.g., 钟, 酒器也 (zhong: 'a wine vessel')。

事件 (**participating**) e.g., 呼, 外息也 (hur: 'to (push) air out')。吸, 内息也 (xir: 'to (push) air in')。

参与者 (**participator**) e.g., 驱, 驱马也 (qui: 'for a person as participator) to drive a horse')³。

描述 (**descriptive (state/manner)**) e.g., 含, 嗑也 (hanz: 'to hold in the mouth')。

产生 (**agentive**) e.g., 荇, 五月牛羔也 (lingz: 'five-month old lamb')。

Through a series of detailed surveys (e.g. Huang et al. 2008a, 2013a, 2013b) on radicals denoting three kinds of concepts for natural kinds-animals (e.g., *yang* 羊: 'goat/sheep', *ma* 马 'horse', *niu* 牛 'cattle'); artifacts (e.g., *dao* 刀 'knife/weapon', *min* 皿 'basin/container', *wang* 网 'net'); and body parts (e.g., *shou* 手 'hand', *kou* 口 'mouth'), several interesting facts are attested: basic concepts of natural kinds derive substantial subordinate concepts via material and formal causes, yet a significant number of concepts are derived through the final cause, such as transportation for horse and farming/sacrificing for cattle, and basic concepts of human body parts are predominantly associated with events in which the body parts participate (final cause), while artifacts associate with final cause. Figure 22.2 shows the ontology of *dao* 刀, and Figure 22.3 displays the dimensions of conceptual extensions, in which we can infer that artifacts are designed with a special functionality, for most of the types of conceptual extensions belong to telic; and a character often denotes a typical event in which the artifact is a main participant.

We can see that radical is the saliently encoded basic component of Chinese orthography, and the semantic relation between the radical encoded basic concept and the meaning of its subordinate characters (从属字) can be succinctly and reliably described with the set of causes as ontological relations, thereby attesting that semantics is indeed an ORL for Chinese orthography. By adopting Generative Lexicon Theory terms, we show that formal, constitutive, agentive, and telic relations are all attested for the derivation of lexical meaning from radical meaning. It is important to note, however, that the event-driven relations of telic and agentive are most productive in generating lexical meaning.

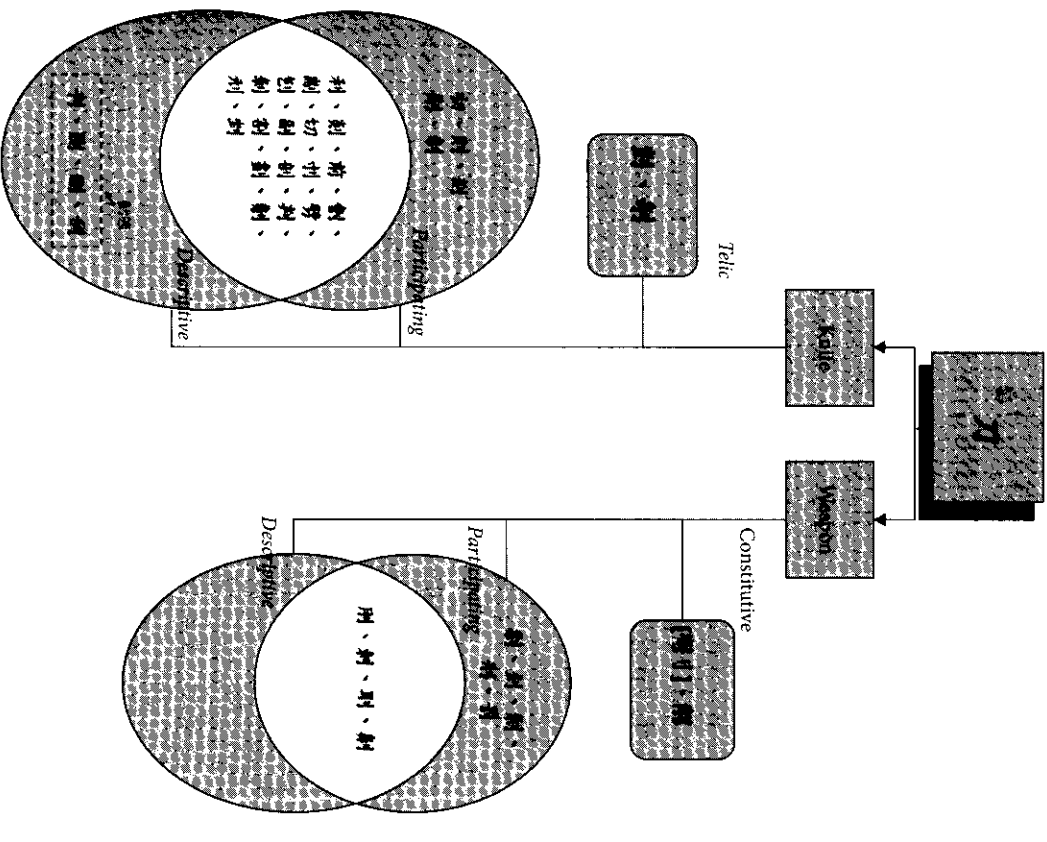


FIGURE 22.2 Ontology of the radical *dao* 刀

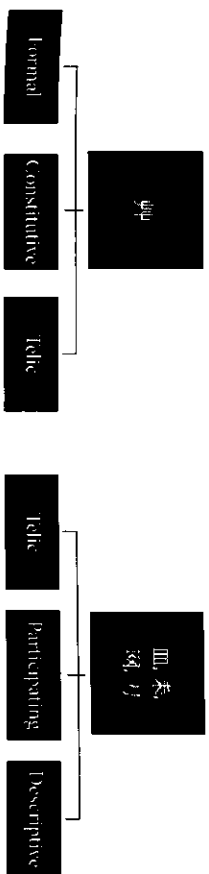


FIGURE 22.3 Observed dimensions of conceptual extensions

22.4 LEXICAL SEMANTIC RELATIONS AND BEYOND

In addition to eventive relations, the lexical-semantic relations (LSR) can be explicated by the intralexical structure of Chinese based on the WordNet model. The term *intralexical* indicates that the structure of lexical information is encoded in the lexicon. All possible LSRs in Chinese can be explained through the new concept of paronymy and the root/head in nominal compounds.

LSRs are crucial components in representing lexical knowledge, for knowing a word does not only simply involve knowing its inherent semantic content but also its relations to other words of the language. LSRs have also been implemented as a core part in current lexical resources like the English WordNet constructed by Princeton University.⁴ It is noted that LSRs here refer mostly to *paradigmatic relations*. The set of words in paradigmatic relations can be said to form some sort of paradigm; that is, they share some common characteristics but differ in some. For example, a morphological paradigmatic relation exists between inflectional variations of verbs like *write*, *wrote*, and *written*, which share everything except their tense form. The paradigmatic relations stand in contrast to what is called *syntagmatic relations*, which exists between words that occur together in syntactic structures, like *heavy* and *rain* (Murphy 2003).

A few paradigmatic relations that receive the most attention in lexical semantics are *semantic paradigmatic* ones between word senses, where they share many semantic properties but fail to share others. For example, *synonymy* constitutes the relation among words having the same meaning; *hypernymy* defines a “type of” meaning; *meronymy* for the “part of” meaning, and so on. The Chinese Wordnet project,⁵ initially launched at Academia Sinica, supports a common set of LSRs that underlie the WordNet framework. These include *synonymy* (e.g., *cong2 bu4/cong2 wei4* ‘never’), *near-synonymy* *baol1 rong2/rong2 ren3*, ‘tolerate/endure’), *antonymy by different contrasts* (*sheng1/si3* ‘life/death’; *kuai2/man2* ‘fast/slow’; *lao3 shi1/xue2 sheng1* ‘teacher/pupil’), *hyponymy/hyponymy* (*ge1/min2 yaol2* ‘song/folk song’), *troponymy* (*ji4 hua4/mi4 mou2* ‘to plant/to plot’), *holonymy/meronymy* (*shou3/shou3 zhang3*, ‘hand/palm’), and others. A set of substitution tests as well as logical conditions for each relation is also defined in Tsai et al. (2002) and Huang et al. (2004), which are meant to be working criterion that facilitate identification of relation instances and promote consistency of decisions among linguists.

Among the LSRs in the design of Princeton WordNet, one can find that the relations for *sister terms* (coordinate terms) still contain a cluster of undifferentiated concepts. Sister terms are used to define those coordinate words that have the same hypernym (also called “superordinate” in WordNet). Such an approach indeed enables the representation for some ontological knowledge. However, Huang et al. (2007) observe that not all coordinate terms are equal when detailed lexical analysis is done for a set of coordinate terms sharing the same hypernym. For example, when people talk about seasons, the first intuition for this concept will be four seasons—spring, summer, autumn, and winter. Other terms for seasons, such as dry season and rainy (i.e., monsoon) season, are

not thought of intuitively as parallel like the four seasons, although all of them share the same superordinate concept, “seasons in a year.” The co-hyponym is quite general, and it is not specific enough to cover the detailed relations for its set of hyponyms. These coordinate terms could be reclassified into conceptually salient groups, and the conventional ways used to define the co-hyponyms, that is, antonymy and near synonymy, seem inadequate to account for such conceptual classification.

Huang et al. (2007, 2008b) propose a new type of lexical semantic relation called *paronymy*, to indicate the relation between any two lexical items belonging to the same semantic classification. Paronyms conform to the following basic requirements: First, paronyms need to be a set of coordinate terms sharing the same hypernym; second, paronyms must share the same classificatory criteria. This is particularly critical because the same conceptual space/semantic field can be partitioned differently by different criteria. For example, as showing in example (1), (1a) and (1b) are both possible exhaustive enumerations of the concept “seasons in a year.” People who live in a certain area, such as Southeast Asia, may prefer to use (1b) to describe their “seasons in a year”; however, to other people in the world, the four seasons of (1a) is the default.

- (1) Two sets of paronyms of the main concept- “seasons in a year”
 (1a). *chun* 春/ *xia* 夏/ *qiu* 秋/ *dong* 冬 ‘spring/summer/autumn/winter’
 (1b). *han* 旱季/ *yu* 雨季 ‘dry season/ rainy (monsoon) season’

In addition, paronymy can capture how these concepts cluster by stipulating the same criterion they shared for conceptual classification. As shown in (1), any element of these two different criteria, such as *xia* ‘summer’ in (1a) and *han* 旱 ‘dry season’ in (1b), do not stand in direct contrast against each other although they are coordinate terms of the same concept “seasons in a year.” In other words, (1a) and (1b) do not belong to the same semantic field, which are defined by minimal semantic contrasts (Grandy 1992). According to Huang et al. (2007), there is still another type of paronymy, *contrary paronymy*.

Contrary paronymy conforms to a condition that each of a set of terms is related to all the others by the relation of incompatibility (Cruse 2004). The paronyms in this type are gradable and their senses are usually contrary. Contrary paronymy allows intermediate terms, so it is possible to have something that is neither A nor B. For example, something may be warm if it is neither hot nor cold. Contrary paronyms are classified under the perceptual or conventional paradigms. The perceptual paradigm is based on human perception or senses; for example, the superordinate node of fast/slow is speed. Whether the speed is fast or slow all depends on someone’s perception, and such perception is variable from one to another.

The conventional paronyms are shown in Figure 22.4a. There are various ways of addressing parents based on the register in Chinese, so those terms are further classified into different groups rather than directly placed under the same superordinate parent. As shown in Figure 22.4b, after reclassifying the sister terms, we get three subclasses because of the register for using the terms to address parents. Using such reclustered classification makes the conceptual structures clearer and better.

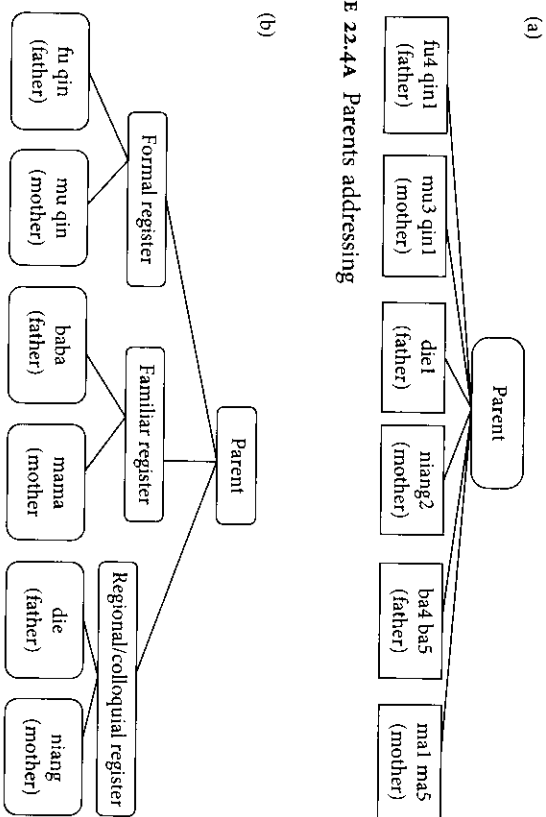


FIGURE 22.4A Parents addressing

FIGURE 22.4B Parents addressing (concepts reclustered by the register)

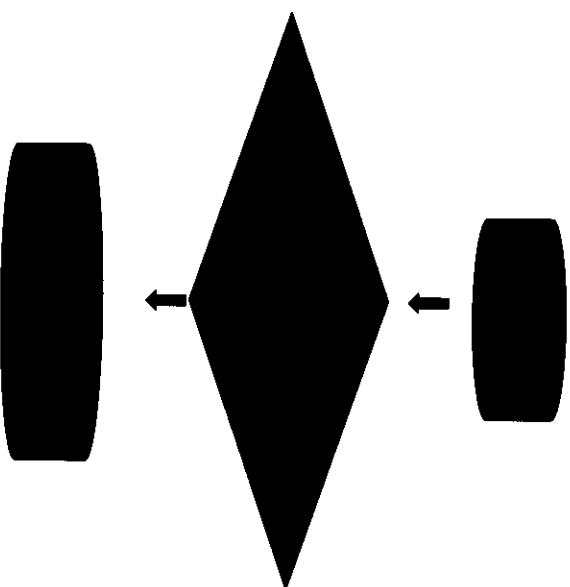


FIGURE 22.5 Process of sister terms reclustered

By paronymy, we can give a more precise account for the coordinate terms or hyponyms, especially those in the contrary type. A process of reclustered sister terms can be formulated, as given in Figure 22.5, and, therefore, such conditions can be applied to the deficiency in WordNet for a further detailed classification.

It is also noteworthy that, in addition to the LSRs introduced so far, morphosemantic relations exist specifically in the root/head in Chinese compound nouns. In European languages, the most important features of the morphosemantic relations are manifested

at the derivational level (i.e., via the *morphological* paradigmatic relation mentioned previously), and they indicate regular and productive semantic oppositions holding between word senses. For instance, the *-er* derivational relation linking *sense* and *sensor* in English implies an inanimate cause / agent relation (Fellbaum et al. 2007).⁶

Over the last two millennia in Chinese philology and philosophy, LSRs between a root/head in a compound noun—for example, the relationship between XH and H (i.e., *hongniu* 红牛/*niu* 牛 ‘red ox/ox’; or *danche* 单车/*che* 车 ‘bike/vehicle’)—have been a significant issue for the lack of salient morphological markers. Though not fully attested, it has been generally observed that in most cases where X is a free form, XH JS-A H can be assumed; in a bound word or root compound form, a telic interpretation of either XH FUNCTIONS as H; or an event related reading is more likely, which seems to support the whole thesis underlining 白马非马 *bai ma fei ma* ‘white horse is not a horse’ (that XH JS-A H is not logically entailed). Readers who are interested in the Generative Lexicon approach to this topic in cross-linguistic settings should refer to Johnston and Busa (1999) and Lee et al. (2010).

22.5 LEXICAL AND GRAMMATICAL REPRESENTATION

Last, lexical eventive information can be linked to grammatical representation by introducing the Module-Attribute Representation of Verbal Semantics (MARVS).

Recent lexical semantic theories have been assumed that (1) lexical semantic contents are mapped at the morphosyntactic level and can be used to predict grammatical behavior (Dowty 1991; Levin 1993; Goldberg 1995), and (2) lexical semantics is the (grammatical) level that mediates conceptual structures with grammatical representations (Bresnan and Kanerva 1988; Zaenen 1993; Pustejovsky 1995), where the (mental) lexicon is the repository of all human knowledge.

The first assumption entails that lexical semantic generalizations can be verified with grammatical realizations. Hence lexical semantic can be studied via observation of regular patterns of the grammatical realizations of different lexical items. Levin (1993:7) concentrates on the range of possible syntactic alternations, called diathesis, of a single verb (or a verb class) and extracts semantic information from syntactic behavior. For instance, *break verbs* (verbs such as *break*, *rip*, *shatter*, *crack*, . . .) can all appear in the middle alternation (“*The vase broke easily*”, but cannot appear in the conative (“*Edith cut (at) the bread*”) or body-part ascension (“*Edith cut her own finger/Edith cut herself on the finger*”) alternation, while *cut verbs* (verbs such as *cut*, *hack*, *scratch*, . . .) can appear in all three alternations. By comparing the other verb groups (e.g., *touch* and *hit*) and respective alternations, she concludes that *break* is a pure change-of-state verb and *cut* is a verb of causing a change of state by moving something into contact with the entity that changes state. However, while the syntactic behavior of diathesis alternations seems to be a promising way to shed light on the semantic classification of verbs in English,

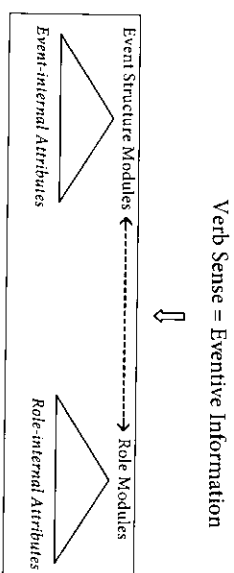


FIGURE 22.6 Module-attribute representation

Liu (1996) found that the pure alternation based approach is not adequate for defining Mandarin Chinese verb classes, for it suffers from methodological weakness in that diathesis alternations have not been extensively studied, and the argument placement is relatively flexible in Mandarin Chinese.

Huang and Ahrens (2000) take this assumption further and make the premise that lexical semantic representation is the grammaticalization of conceptual information; that is, lexical semantics not only can be empirically verified with grammatical predictions but can also be justified by conceptual arguments. They propose an adequate theory of verbal semantics with the design criteria of (1) *direct presentation*, where lexical semantic information must be represented in a way that can be linked directly to grammatical structures; (2) *conceptual motivation*, in which lexical semantic information is grounded; (3) (supported by) *representational clues*, including collocations, argument selection constraints, distributional patterns, and so on that can be attested by corpus evidence. The same criteria are also applicable to the issue of identification and delineation of word senses in Chinese (Ahrens et al. 1998; Tsai et al. 2002).

The theory proposed (MARVS; Huang and Ahrens 2000; Chang et al. 2000; Ahrens et al. 2003) starts with hypothesizing that syntactic variations, including Levin's diathesis alternations and other morphosemantic variations, can be predicted by logical implications of the semantic properties encoded on the event structure of each verb. It thus proposes two types of modules: EVENT STRUCTURE modules on the one hand and ROLE modules on the other hand, as well as two sets of attributes: event-internal attributes and role-internal attributes, which are attached to the event structure module and role module, respectively (see Figure 22.6).

As a theory of linguistic event representation rather than logical event representation, event modules in MARVS are the building blocks that define the basic "shapes" and "content" of events. That is, event boundaries are defined by temporal reference, and event contents are classified according to the texture (or the lack of texture) of the event perceived by the speakers. Particularly, MARVS postulates that the following five atomic event structures are necessary to capture the range of complex linguistic event structures:

(1) • Boundary (including a Complete Event)

Boundary is an event module that can be identified with a temporal point and that must be regarded as a whole.

(2) / Punctuality
Punctuality is an event module that represents a single occurrence of an activity that cannot be measured by duration.

(3) //// Process

Process is an event module that represents an activity that has a time course (i.e., that can be measured in terms of its temporal duration).

(4) _____ State

State is a homogeneous event module in which the concept of temporal duration is irrelevant (i.e., it is neither punctual nor has a time course).

(5) ^^^^^ Stage

Stage is an event module consisting of iterative subevents.

The event-internal attributes, such as [control], [effect], [accelerated], refer to properties that can be assigned to an event, and they are motivated by cognitive necessity and supported by linguistic data. In the following example, we see that only events with internal attribute [control] can be prohibited:

bie gaoxing / *bie kuaijie

别高兴 / *别快乐

NEG happy / NEG happy

'Don't be happy?'

The ROLE modules, in contrast with EVENT modules, contain the focused roles (participants) of an event and typically include all arguments, such as AGENT, CAUSE, CAUSER, COMPARISON, INCREMENTAL THEME, GOAL, LOCUS, and so on, while the role-internal attributes refer to the semantic properties of the participants, such as [sentience], [volition], [affectedness], and so forth.⁷

The proposed MARVS has associated grammatical consequences: (1) eventive information is attached to the sense of a verb; that is, verbs with different senses will have different eventive information; (2) the event presentation of a verb is the sum of all attested event realization of a particular verb; and (3) the design of modules serves as a basic frame of verb semantics by *prepackaging* semantic information while the attached attributes give more detailed description. The theory has been attested in light of Chinese data and has suggested that it can highlight the difference between synonymous sets (e.g., *gaoxing* 高兴 / *kuaijie* 快乐), and the meaning of semantically bleached verbs (e.g., *jinxing* 进行 / *zuo* 做 'do'). By interacting with a rich nominal semantic system such as Pustejovsky's *qualia* structure as introduced before, it can account for constructional

meaning as in *zhui* 追 'chase' / *gan* 趕 'rush' + NP (Liu et al. 1999; Chang et al. 2000). For instance, the MARVS representation of *gan* can be formulated as follows:

- *gan* 趕 'rush'
- *CAUSE* <*e*, AGENT, GOAL, BY-TI> || [control, accelerated] [eventive]

And the coercion of *eventive* meaning can be triggered by *qualia* structure of the nominals, as illustrated in sentences (a) and (b); it can also predict range of possible interpretations as seen in (c):

- (a) GAN *gongche* 赶公车
'rush to catch the bus'
[BUS [TELLIC = running on a fixed schedule]]
- (b) GAN *baogao* 赶报告
'rush to finish the paper'
[PAPER [AGENTIVE = writing]]
- (c) GAN *le san chang bisai* 赶了三场比赛
'rushed in playing three games'
[GAME [TELLIC = entertaining/watching]]
'rushed in watching three games'
[GAME [AGENTIVE = playing]]

22.6 CONCLUSION

Lexical semantics allows us to study language as a knowledge system and to explore how human beings conceptualize and map conventionalized concepts to linguistic representations. Chinese lexical semantics offers a particularly interesting case of study as the Chinese orthography conventionalizes semantic information and for its heavy reliance on lexical meaning due to poverty of morphosyntactic markings. Many exciting topics, such as the lexical semantics of compounding and the lexical semantics of emotion, are not fully explored yet and hold great promise for shedding light on our understanding of human conceptualization and cognition.

NOTES

1. Andrea Falcon, "Aristotle on Causality," from *The Stanford Encyclopedia of Philosophy*, <http://plato.stanford.edu/archives/fall2008/entries/aristotle-causality/>

2. The system first took shape as what is called *Hantology* (hantology.sinica.edu.tw), implemented through SUMO (www.ontologyportal.org) and SinicaBOW (bow.sinica.edu.tw). See the Hantology website for more information and instances.
3. In this case, humans are the participants.
4. See <http://wordnet.princeton.edu>. Modeling on the English, its counterparts of languages with different typology are growing rapidly and have shaped up a global WordNet community. See also <http://www.globalwordnet.org/>
5. <http://cwn.ling.sinica.edu.tw> and maintained at <http://lope.linguistics.ntu.edu.tw/cwn/>
6. Koeva et al. (2008) demonstrate that there are systematic morphosemantic differences concerning derivational mechanisms between English and Slavic languages.
7. It is noted that roles in MARVS are simply prototypes used to describe the relations that a participant plays in an event. They are not the predefined theta-roles (see Dowty 1991). More detailed explanation on MARVS can be found in Huang and Ahrens (2000).

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CHAPTER 23

RESULTATIVE VERB
COMPOUNDS IN MANDARIN

SHIAO WEI THAM

23.1 INTRODUCTION

COMPOUNDING is highly productive in Mandarin, and compounds come in many varieties.¹ Among these, resultative verb compounds (RVCs) are significant both in their pervasiveness and in the issues they raise for linguistic theory. An RVC comprises two verbal elements, the second of which (V₂) describes some facet of a result associated with an event described by the first (V₁). V₂ may describe the result itself (1a) or further modify a result state inherent to the meaning of V₁ (1b): The verb *lie* 'crack' expresses a change of state (COS), which *kai* 'open' further specifies. Some V₂ describe the progress or extent of the event described by V₁, according to some measure: In (1c) *kan-wan* 'finish reading *lit.* read-finish' measures completion of the reading event by the "consumption" of the relevant book. Other such "phase" (Li and Thompson 1981) result V₂s may describe attainment of a result, such as a desired result coming into existence (e.g., *zuo-dao* 'succeed in doing, *lit.* do-arrive/to'). V₁ or V₂ may themselves be compounds (e.g., *jin-lai* 'enter, *lit.* enter come' in (1d); Li and Thompson 1981:54).

- (1) a. Sanmao da-po-le bei-zi
 Sanmao hit-break-PERF² cup
 'Sanmao broke the cup.'
 b. shangkou lie-kai-le
 wound crack-open- PERF
 'The wound cracked open.'

- c. Sanmao kan-wan-le na ben shu
 Sanmao read-finish-PERF that CL book
 'Sanmao has finished reading the book.'

- d. Sanmao zou-jin-lai-le
 Sanmao walk-enter-come-PERF
 'Sanmao walked in (toward speaker).'

As an instance of complex predication, Mandarin RVCs raise questions about how the properties of its constituent verbs contribute to those of the compound itself. Section 23.2 discusses argument realization, transitivity alternations, and result predication in RVCs. Section 23.3 discusses event structural properties of RVCs.

23.2 INTERFACE WITH SYNTAX

This section discusses the syntactic behavior of RVCs, which often reflects properties of the resultative situation and general structural characteristics of the language.

23.2.1 Argument Realization

The main question concerning argument realization in RVCs can be termed the "one-too-many" problem. In an RVC such as (2), V₁ is transitive, with two arguments, V₂ is intransitive, with one, but the RVC itself is only two-place and not three-place.

- (2) Zhangsan qi-lei-le ma
 Zhangsan ride-tired- PERF horse
 'Zhangsan rode the horse and as a result, Zhangsan/the horse got tired.'

This means the three arguments or thematic roles from V₁ and V₂ (sometimes more) must somehow be resolved to two for the RVC. The interpretations available for (2) suggest this is achieved by identifying either role of V₁ with V₂'s role. Identifying V₁'s agent (the rider) with V₂'s role, we obtain the reading that the rider got tired. Identifying V₁'s patient (the "ridee") with V₂'s role, we get the reading that the horse became tired. Importantly, however, the RVC retains the syntactic realization pattern expected from simplex verbs: The agent maps to subject, the patient to object. That is, just as in *Zhangsan qi-le ma* 'Zhangsan rode a horse, *lit.* Zhangsan ride-PERF horse', (2) can only mean Zhangsan rides the horse and not that the horse rides Zhangsan. These generalizations are captured in Li's (1990) seminal analysis of Mandarin RVCs. RVCs like (2) are only part of the picture, however. For a fuller view, we must turn to the next great issue concerning Mandarin RVCs: causativity.

23.2.2 Causativity

Gu (1992), Li (1995), and related works note the availability of apparently “inverted” readings for RVCs (3iii), besides the interpretations in (3i–ii) that mirror the argument realization of *zhui* ‘chase’:

- (3) Zhangsan zhui-lei-le Lisi
 Zhangsan chase-tired-PERF Lisi
 ‘Zhangsan chased Lisi and (i) Zhangsan/(ii) Lisi got tired./
 (iii) Lisi chased Zhangsan and Lisi got tired.’

In (3iii), it seems *Vi*’s patient, the “chasee,” is realized as the RVC subject; *Vi*’s agent, the chaser, is realized as the RVC object. This seeming inversion of role realization, however, becomes more intuitive if we consider these roles as participants in a causative situation. The chasee, perhaps a trained runner, causes the chaser to become tired from the chasing. That is, if understood as a cause, a role can be realized as the RVC subject even though it would not have been the subject in an active sentence headed by *Vi* alone. Moreover, it is a causative relation between the events described by *Vi* and *V2*, rather than an “inverted” argument realization pattern, that determines what can be realized as the RVC subject (a cause). As (4) shows, the cause need not even correspond to a role of *Vi*. The subject in (4) is a cause, but it does not describe the agent of *Vi*, the crier.

- (4) Zhangsan de si ku-hong-le Lisi de yanjing
 Zhangsan DE death cry-red-PERF Lisi DE eye
 ‘Zhangsan’s death caused the result of Lisi’s crying his eyes red.’

Besides a cause, the causative situation also involves an affected entity (the AFFECTEE). RVC roles that diverge from that of *Vi* often arise when the affectee is understood as (related to) an EXPERIENCER—a sentient being that undergoes some sensation or emotion: In (3iii), the “inverted” reading of (3), the affectee experiences weariness, while in (4) the affectee *Lisi de yanjing* ‘Lisi’s eyes’ bears a body-part relation to *Lisi*, who experiences an emotion. Of course, the affectee need not be a sentient being (5):

- (5) mi yu xia-hei-le tiandi
 dense rain fall-black-PERF heaven/earth
 ‘Dense rain fell, darkening the world.’
 (Li 1980, from Zhou Libo’s *Baofeng Zhouyu*)

In general, the syntactic and interpretational properties of a causative RVC are best understood as resulting from the causative situation and not as tied to particular syntactic patterns or roles with particular interpretations. For further discussion of the effect

of causativity on the interpretation and syntactic realization of RVC roles, see Gu (1992), Li (1995), Her (2007), Shibagaki (2010), and Williams (Forthcoming).

23.2.3 Transitivity Alternations

Another important feature of RVCs is that they display transitivity alternations that, despite their compound nature, mirror alternations shown by simplex verbs. In these alternations, causation plays an important role as well.

Example (6) demonstrates an UNACCUSATIVE/CAUSATIVE alternation. The intransitive RVC in (6a), which shows a single patient-like argument, is considered unaccusative. Its transitive counterpart (6b) shows an added causer subject.

- (6) a. Zhangsan zui-dao-le
 Zhangsan intoxicated-fall-PERF
 ‘Zhangsan got so drunk that he fell/collapsed.’
 b. nei bei jiu zui-dao-le Zhangsan
 that cup wine intoxicated-fall-PERF Zhangsan
 ‘That glass of wine caused Zhangsan to become so drunk that he fell/collapsed.’

Example (7) shows the same alternation with a monomorphemic unaccusative verb. Example (8) illustrates it in a phrasal resultative, where the result is expressed by a post-verbal phrase following the marker DE. This alternation is found in other languages (e.g., *The ship sank/They sank the ship* in English).

- (7) a. men kai-le
 door open-PERF
 ‘The door opened.’
 b. Zhangsan kai-le men
 Zhangsan open-PERF door
 ‘Zhangsan opened the door.’
 (8) a. Zhangsan zui-de zhan-bu-qi-lai
 Zhangsan intoxicated-DE stand-not-arise-come
 ‘Zhangsan was so drunk he could not stand up.’
 b. Na ping jiu zui-de Zhangsan zhan-bu-qi-lai
 that bottle wine intoxicated-DE Zhangsan stand-not-arise-come
 ‘That bottle of wine got Zhangsan so drunk he could not stand up.’

Unlike *zui-dao* ‘intoxicated-fall’ in (6), the RVC *he-zui* ‘drink-intoxicated’ in (9) has an agentive *Vi*. When intransitive as in (9a) (the object is optional), the single role is

an agent. This RVC also allows an added causer subject (9b), unexpected from a cross-linguistic perspective. Agentive verbs in English, for instance, cannot be causativized: *The children laughed!*/**The clown laughed the children.* This prohibition extends to resultatives: *She laughed herself silly!*/**The joke laughed her silly.*

- (9) a. Zhangsan he-zui-le (jiu)
 Zhangsan drink-intoxicated-PERF wine
 'Zhangsan drank (wine) and got drunk.'
 b. nei bei jiu he-zui-le Zhangsan
 that cup wine drink-intoxicated-PERF Zhangsan
 'That glass of wine got Zhangsan drunk (from drinking it).'

Now Mandarin agentive verbs outside a resultative context also cannot causativize. Note, however, V₂ in *he-zui* 'drink-intoxicated' contributes an experiencer role, which, as noted in Section 23.2.2, facilitates the role being interpreted as affected. That is, (9b), like (3iii), could be attributed to the nature of the situation described: *Zhangsan* in (9a) is interpreted as being affected, allowing another participant (here, the wine) to be understood as a causer.

Finally, intransitive RVCs with an agentive V₁ (10a) may show a transitive structure that adds a patient instead of a causer: Unlike (6b), the additional nominal *baomu* 'nanny' in (10b) describes the patient of the RVC, not a causer. In both (10a) and (10b), the causer would correspond to the agent, in this case *xiaohair* "child," but only in (10b) is an affected participant overtly realized. In (10a), the affectee is also the causer, suggesting that at least some RVCs may be causative without being transitive.

- (10) a. xiaohair ku-xing-le
 child cry-awake-PERF
 'The child awoke from crying.'
 b. xiaohair ku-xing-le baomu
 child cry-awake-PERF nanny
 'The child cried the nanny awake.'

As with (6), the alternation in (10) is also found with monomorphemic verbs and phrasal resultatives.

That is, the syntactic alternations of RVCs reflect both their causative nature (9) and the structures generally available in the language. For detailed discussion, see Cheng and Huang (1994). Huang (2010) provides a more recent treatment geared toward explaining differences between English and Mandarin. Huang and Lin (1992) propose a different approach (with different results) that nevertheless shares the insight that RVCs follow general principles of the syntax-semantics interface in Mandarin.

23.2.4 Predicating the Result

RVCs such as *ku-xing* "cry-awake" in (10a) which may be causative and intransitive, suggest that the sole argument could express both the cause and the affectee. This places Mandarin RVCs in interesting contrast with English resultatives, which generally predicate the result of a direct object, a property known as the direct object restriction (DOR; Simpson 1983). Most Mandarin RVCs respect the DOR; (11a) is a classic example with an agentive subject and an object of which a change is predicated. The RVC in (11b) shows an "inverted" role realization: The patient of the eating event, but also the cause of the ensuing poverty, is the subject. Despite their different role realizations, these RVCs share a commonality: The result is predicated of the object. In (11a), the mudball becomes flat; in (11b), the speaker becomes poor.

- (11) a. xiaohair ya-bian-le ni-tuan
 child press-flat-PERF mud-ball
 'The child pressed the mudball flat.' OBJECT-ORIENTED
 b. zhe dun fan zhen chi-qiong-le wo
 this CL rice really eat-poor-PERF 1SG
 'The eating of this meal has really made me poor!' OBJECT-ORIENTED, INVERTED

Examples (6a) and (9a) appear to violate the DOR: They are intransitive, and the result applies to the subject. But (6a) is unaccusative: its subject realizes a patient-like role, which is understood to originate as an object at an underlying level of representation. Therefore it is not considered a DOR violation. This is one possible interpretation of (9a) (also 10a). If the ability to causativize indicates unaccusativity, (9b) could be understood as a special case of (6a). That is, RVCs with experiencer subjects would be optionally unaccusative.

Still, experiencer subject RVCs differ from unaccusative V₁ RVCs in preferring SUBJECT-ORIENTED interpretations: Even with an object nominal present (9a), the result is predicated of the subject. Apart from experiencer subject RVCs, directed motion RVCs are also subject-oriented: In (12), the crow reaches the result location.³

- (12) wuyu fei-dao-le qiang-shang
 crow fly-arrive-PERF wall-upon
 'The crow flew onto the wall.' SUBJECT-ORIENTED

Object- and subject-oriented RVCs differ in their compatibility with the BA and BEI constructions. The former occur felicitously in these constructions (13), but the latter do not (14; see, e.g., Li 1995:271, 277 and references cited therein).

- (13) a. xiaohair ba ni-tuan ya-bian-le.
child BA mud-ball press-flat-*PERF*
'The child pressed the mudball flat.'

b. wo zhen bei zhe dun fan chi-qiong-le
1SG really BEI this CL rice eat-poor-*PERF*
'I've really been made poor by the eating of this meal'

- (14) a. *wuya ba qiang-(shang) fei-dao-le

crow BA wall-upon fly-arrive-*PERF*

Intended: as in (13)

- b. *jiu bei Zhangsan he-zui-le

wine BEI Zhangsan drink-intoxicated-*PERF*

Intended: Zhangsan got intoxicated from the wine being drunk by him.

Motion event resultatives in English also allow the result to apply to the subject (Rappaport Hovav and Levin 2001), but the subject-oriented nature of experienter subject RVCs has no English counterpart. For further discussion see Huang (2010).

23.3 THE RESULTATIVE EVENT

RVCs are not merely complex predicates; they also describe complex events. This section discusses the temporal structure of the RVC, how the subevents of the resultative event are related, and where the interpretation of change is encoded in the RVC.

23.3.1 RVCs as "Covert Accomplishments"

The linguistic contexts in which a predicate occurs are known to be sensitive to the temporal structure of the event description (Dowty 1979). Most STATE predicates are not felicitous in the progressive (e.g. #*Pat is believing Sandy*). *ACTIVITY* predicates (e.g., *swim*) occur more naturally with durative adverbial modifiers such as *for an hour* but less so with modifiers such as *in an hour*, with which they only allow the reading that the relevant activity began after an hour. Compare *Pat swam for an hour/Pat swam in an hour* (= Pat's swimming began after an hour). *ACHIEVEMENT* predicates, however, describe instantaneous events of change (e.g., *arrive*) and occur naturally with *in an hour*, meaning the event was completed after the hour, but not with *for an hour*. Compare *Pat arrived for an hour/Pat arrived in an hour* (= Pat's arrival was complete after an hour).

Causative predicates largely fall within the class of *ACCOMPLISHMENTS*, events of change preceded by a durative event. This bipartite event structure can be tapped with adverbials such as *almost*: *Pat almost broke the glass* is ambiguous between (i) Pat doing something to the glass which almost got it broken, or (ii) Pat almost doing something that would have broken the glass (e.g., almost stepping on it). Since many RVCs describe change caused by a durative event, one might expect them to be accomplishments. Yet surprisingly, RVCs apparently behave like achievements.

RVCs are generally incompatible with progressive aspect, a hallmark of achievements:

- (15) wo zai xue(*-hui) Zhongwen
1SG PROG learn-master Chinese

'I am learning/*mastering Chinese.'

Modification of RVCs by *jihu* 'almost' (16a) and negation with *mei* (17a) also target the result subevent. In contrast, V1 alone in the same contexts allows only the activity to be modified ((16b), (17b)).

- (16) a. Zhangsan jihu hua-wan-le yi zhang hua

Zhangsan almost draw-finish-*PERF* one CL picture

'Zhangsan almost finished painting a picture (the picture was almost complete.)'

- b. Zhangsan jihu hua-le yi zhang hua

Zhangsan almost draw-*PERF* one CL picture

'Zhangsan almost painted a picture (no painting was done.)'

- (17) a. Zhangsan mei xue-hui Zhongwen

Zhangsan NEG learn-master Chinese

'Zhangsan didn't (manage to) master Chinese.'

- b. Zhangsan mei xue Zhongwen

Zhangsan NEG learn Chinese

'Zhangsan didn't learn Chinese.'

These diagnostics, from Tai (1984), suggest Mandarin RVCs describe achievements. Tai (1984:22) concludes that RVCs only have "result aspect." Providing other modification contexts such as with *kuai* 'about to' and postverbal duration phrases, Chief (2008:151) proposes that only the result subevent, which he terms the "distinguished subevent," is "relevant for semantic modification." Yet noting that V1 in many RVCs does indeed describe a durative process, Chief maintains that RVCs are not achievements but rather are accomplishments in which the process phase is simply "not accessible for aspectual modification" (108).

Indeed, the durative subevent of the resultative event can be detected. Example (18) shows RVCs are compatible with adverbials such as *san fenzhong nei* 'in three minutes', interpretable as the mudball being flat after three minutes, with pressing taking place during those three minutes (Tham 2012).

- (18) xiaohair san fenzhong-nei ya-bian-le ni-tuan
 child three minute-within press-flat-PERF mud-ball
 'The child pressed the mudball flat in three minutes.'

The availability of this reading converges with Chief's (2008) contention that RVCs describe accomplishments.

23.3.2 Coextension

Example (15) notwithstanding, some RVCs do allow progressive aspect (19). Chief (2008:153 [32–33]) argues this is a systematic class.

- (19) a. ta zai la-chang xiangpijin
 3SG PROG pull-long elastic.band
 'He is pulling the elastic band long.'
 b. tamen zai tuo-kuan malu
 3PL PROG expand-wide road
 'They are widening the road.'

Adjectival/stative and COS predicates involving GRADABLE properties may differ in SCALAR STRUCTURE (Kennedy 1997; Hay et al. 1999). Gradable adjectives in English, for instance, may be associated with a BOUNDED or nonbounded scale. The former (e.g., *clean, straight*) are compatible with adverbs such as *completely*, while the latter (e.g., *long, wide*) are not: It is far more natural to say something is *completely clean* or *completely straight* rather than *#completely long* or *#completely wide*. These classes also show different entailment relations across different verb forms: While *Kim is lengthening the rope* entails *Kim has lengthened the rope*, *Kim is straightening the rope* does not entail *Kim has straightened the rope* (Hay et al. 1999).

The resultative event may be considered as comprising two subevents: *V*₁ describes an event *e*₁ with duration that need not involve change; *V*₂ describes a resultant change. *e*₂. Chief (2008) proposes the RVCs in (19) are COEXTENSIVE compounds, with a durative *V*₁ and a *V*₂ associated with an open-ended scale. As *e*₁ progresses, there is a corresponding degree increase on *V*₂'s associated scale (Chief 2008:154–155): In (19a), the elastic band becomes longer as the pulling extends in time. Chief argues noncoextensive compounds such as *hua-wan* 'draw/paint-finish' do not show these characteristics: *wan*

'finish' is not open-ended, and the painting and completion events are related by precedence, not by a synchronous unfolding in time.

23.3.3 The Locus of Change

RVCs encode a change, whether of state or location. But where or how change is encoded in the RVC is not always obvious. A typical RVC such as (20) contains an activity *V*₁ that does not entail a result. *V*₂ such as *bai* 'white' are potentially adjectival and *prima facie* describe states.

- (20) man-tian da xue shua-bai-le zheng ge shijie
 overwhelm-sky great snow brush-white-PERF whole CL world
 'The reeming snow brushed the entire world white.'

There thus seems to be no apparent result-encoding morpheme in an RVC, despite the resultative meaning of the compound itself. Is the COS meaning encoded by *V*₁, *V*₂, or in another way? All three cases are attested.

23.3.3.1 Result *V*₂

In RVCs such as (20), *V*₂ is best understood as a COS verb, that is, the meaning of change comes from *V*₂. This conclusion receives support from three sources. First, putative adjectives have COS counterparts. (21a) shows *bai* 'white' with a degree modifier *hen* 'very', suggesting it is an adjective. But these words also exhibit COS interpretations, most notably when the perfective marker *-le* is present (21b).

- (21) a. Sanmao toufa hen bai
 Sanmao hair very white
 'Sanmao's hair is (very) white.' STATE
 b. Sanmao toufa bai-le
 Sanmao hair white-PERF
 'Sanmao's hair has turned white.' COS

The COS interpretation in (21b) does not arise from perfective *-le*, however. As the following examples demonstrate, COS meanings of putative adjectives are available even without *-le* (Sybesma 1997:230 [21]):

- (22) a. ta neng gao
 3SG can tall
 'He can become tall.'

- b. ta hui pang
3SG will fat
'He will become fat.'

Stative and COS meanings can be distinguished in other contexts. COS words cannot be modified by *hen* 'very' but take the degree modifier *-de hen* *lhai* 'to a serious extent'. Example (23a), where *bai* 'white' is modified by *hen* 'very', only has a stative interpretation. Example (23b), where *bai* 'white' is modified with *-de hen* *lhai* 'to a serious extent', only has a COS interpretation. The context *yi-sheng-xialai*... *jiu* 'once (someone) was born' discriminates between these readings. Example (23a) is felicitous, describing congenitally white hair; (23b), however, allows only the bizarre COS interpretation that Sanmao's hair turned drastically white at birth.

- (23) a. Sanmao (yi-sheng-xialai) toufa (jiu) hen bai
Sanmao one-born-down hair jiu very white
'Sanmao's hair was (very) white (from the moment he was born).'
b. Sanmao (#yi-sheng-xialai) toufa (#jiu) bai-de hen lhai
Sanmao one-born-down hair jiu white-DE very serious
'Sanmao's hair turned very white (#from the moment he was born).'

This suggests *bai* 'white' is ambiguous between a stative (23a) and a COS (23b) meaning (Tham 2010, 2013).

Second, COS verbs with no stative counterpart also occur as V2. The predicate *lie* 'crack' cannot be modified by *hen* 'very' (24a) but allows '*de hen* *lhai*' 'to a serious extent' (24b), suggesting it is a COS verb. Yet *lie* 'crack' readily forms RVCs (24c).

- (24) a. *jingzi hen lie
mirror very cracked
b. jingzi lie-de hen lhai
mirror crack-DE very serious
'The mirror is badly cracked.'
c. Sanmao peng-lie-le jingzi
Sanmao bang-crack-PERF mirror
'Sanmao banged the mirror, cracking it.'

Illustrating the same point, *dao* 'arrive', which describes change of location, also occurs as V2 (12).

Finally, the COS status of V2 in RVCs may be tapped by the POTENTIAL CONSTRUCTION. RVCs in general participate felicitously in the potential construction

(e.g., *ya-bu-bian* 'unable to flatten by pressing, *lit.* press-NEG-flat; *zui-de-dao* 'able to cause (someone) to collapse from intoxication, *lit.* intoxicated-get-collapse'). But with COS V1 and stative V2 (e.g., *diao-zai* 'drop be at'), the potential construction is disallowed: **diao-bu-zai* 'unable to drop to' is ungrammatical, contrasting with *diao-dao* 'drop to, *lit.* drop-arrive', which allows *diao-bu-dao* 'unable to drop to'. This suggests putative adjectives such as *bai* 'white' are COS verbs in V2 position of an RVC (Tham 2012).

23.3.3.2 Result in V1

In some RVCs, V1 encodes change, with V2 further specifying the change (25a). The potential construction suggests that V2 in (25a) is also COS: *dong-bu-ying* 'unable to harden through freezing' is grammatical. V2 may also simply be stative, as in (25b). As noted previously, V-*zai* cannot occur in the potential construction: **luo-bu-zai* 'unable to be at (someplace) from falling', contrasts with *luo-bu-dao* 'unable to get to (someplace) by falling', where V2 describes a change of location.

- (25) a. xuegao dong-ying-le
ice.cream freeze-hard-PERF
'The ice-cream is frozen hard.'
b. xuehua luo-zai di-shang le
snowflake fall-be at ground-upon PR1
'The snowflakes have fallen onto the ground.'

Result V1 compounds can also be distinguished along the coextension division. The crucial distinction seems to reside in V2. Where V2 is associated with an open-ended scale, as Chief (2008) proposes, the compound allows progressive aspect (26a). Otherwise, the compound is noncoextensive and incompatible with the progressive. Example (26b) shows *diao* 'drop', a verb of directed motion, may be progressive, but the compound *diao-dao* 'fall-arrive' in (26c), where V2 is not associated with an open-ended scale, cannot be.

- (26) a. didi (yi-tian-tian) zai zhang-gao
younger.brother one-day-REDUP PROG grow-tall
'Younger brother is growing taller (day by day).'
b. zhishu yizhi zai diao COEXTENSIVE
index continuously PROG fall
'The (stock market) index has been continuously falling.'
c. zhishu (*zai) diao-dao yi-qian dian
index PROG fall-arrive one-thousand point
'The index fell/*is falling to 1000 points.' NON-COEXTENSIVE

23.3.3.3 *Inferred Results*

Finally, result interpretations may arise through pragmatic inference. Tai (1975) notes that postverbal place adverbials in Mandarin yield result location interpretations in motion events (27a) but preverbal ones (27b) do not.

- (27) a. xiao houzi tiao zai ma-bei-shang
 small monkey jump beat horse-back-upon
 'The little monkey jumped onto the horse's back.'
 b. xiao houzi zai ma-bei-shang tiao
 small monkey beat horse-back-upon jump
 'The little monkey is jumping on the horse's back.'

Tham (2011) argues that in sequences such as (27b), with a manner of motion verb and the locational coverb *zai* 'be at', the result interpretation is not lexically specified but rather is pragmatically inferred. First, the result location interpretation of *V-zai* is not consistently available (28).

- (28) a. ...fei-zai kong-zhong de wuya...
 fly-beat sky-within DE CROW
 '...crows flying in the sky...' NON-RESULT LOCATION
 b. wuya fei-zai qiang-shang le
 crow fly-beat wall-upon PRT
 'The crow has flown on the wall.' RESULT LOCATION

Second, these result location readings are facilitated by contextual-pragmatic factors. Tham (2011) reports results from a study of naturally occurring examples from the Peking University corpus⁴ showing these result location readings are facilitated by the following conditions:

- (i) The manner of motion verb describes short, punctual motion; for example, almost all instances of *tiao-zai* 'jump-beat' showed result location interpretations.
 (ii) Less elaborated path description; for example, no source location is described (29a). With a source location *dao* 'arrive/to' is used (29b).

- (29) a. ...ca de yi sheng; na guizi de naodai bian fei-zai yi bian le
 ONOM DE one sound that devil DE head then fly-beat one side PRT
 'A sound of slicing, and the devil's (enemy combatant) head flew to one side.'

- b. yuhangyuan cong diqiu fei-dao/*zai yueqiu-shang
 astronaut from earth fly-arrive/*beat moon-upon
 'The astronaut flew from the earth to the moon.'

- (iii) Less elaborated manner of motion; for example, no adverbial modification emphasizing the difficulty of the motion:

- (30) a. ta hui-zhuan shen qu, pa-zai ta de xi-shang...

3SG return-turn body go climb-beat 3SG DE knee-upon

'She turned back and climbed onto his knee...'

- b. ta zhengzha-zhe pa-dao/*zai yi ge xiao shandong

3SG struggle-PROG crawl-arrive/*beat one CL small cave

'He crawled, struggling, to a small cave.'

- (iv) The motion clause occurs as part of a string of narrative clauses describing a sequence of events:

- (31) ...guizi ba cidao yi reng; liangyan yi fan, gun zai Ma Ying shen-pang

... devil BA bayonet one toss two eyes one flip roll.beat NAME body-side

'The devil (enemy combatant) tossed away the bayonet, rolled his eyes, and tumbled to Ma Ying's side.'

The "squishy" nature of some of these conditions, such as the notion of a "shorter" or "longer" event, suggest the result location interpretation of *V-zai* arises through contextual-pragmatic factors rather than lexical specification, indicating yet another option for expressing result predication in Mandarin. Whether inferred results are available for nonmotion compounds is a topic for further research.

23.4 CONCLUSION

Summarizing, RVC sentence structure reflects both properties of the situation described and general structural properties of Mandarin. The RVC result may be predicated of the object or, in the case of experienter subject and motion verb compounds, the subject. RVCs describe accomplishments, although most aspectual modifiers target the result subevent. The subevents of the resultative event may be coextensive if *V*₂ is associated with an open-ended scale. Change may be encoded in *V*₁, *V*₂, or with motion *V-zai* compounds, may arise contextually.

NOTES

1. I follow convention in using "Mandarin" to refer to the variety of Chinese that is more correctly known as "Modern Standard Chinese" (Chen 1999).
2. Abbreviations: 1/3 = first/third person; CL = classifier; NEG = negation; ONOM = onomatopoeia; PERF = perfective; PL = plural; PROG = progressive; PRT = sentence-final particle; REDUP = reduplication; SG = singular.
3. The syntax of a sequence such as *fei-dao* 'fly to' and *fei-zai* 'fly be at' discussed later (see Section 2.3.3.3) is not necessarily uniform across contexts. Since they may be suffixed with the perfective marker *-le*, as in (12), I treat them as compounds here. In some cases, however, *zai* or *dao* and others may head a postverbal prepositional phrase.
4. <http://ccl.pku.edu.cn:8080/ccl/corpus/index.jsp?dir=xiaandai>

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CHAPTER 24

THE ENCODING OF MOTION
EVENTS IN MANDARIN
CHINESE

JINGXIA LIN

24.1 BACKGROUND

MOTION event in this chapter refers to the event in which an object moves and changes its location with respect to another object (the reference object). Chinese can express a motion event by only one verbal morpheme (1a) or by a concatenation of verbal morphemes (1b).¹

- (1) a. ruguo ni bu jieyi de hua, wo jiu hui fangjian le
if you NEG mind REL word I then return room PRT
'If you do not mind, I will go back to the room.' (PKU Corpus)²
- b. ta gunong-zhe zou-hui fangjian
he mutter-DUR walk-return room
'He walked back to the room, muttering.' (PKU Corpus)

This chapter mainly discusses the latter type and calls them multimorpheme motion constructions (MMMCs). Many previous studies either treat MMCs as a type of resultative verbal compounds or suggest that there is a temporally sequential relationship between these morphemes. However, these observations cannot account for all possible Chinese MMCs or the relative order between the motion morphemes.

24.1.1 Multimorpheme Motion Constructions as Resultative Verbal Compounds

Resultative verbal compounds are compounds consisting of two elements in which the second element specifies some result of the action denoted by the first (Li and Thompson 1981). Chinese motion constructions with two or three immediately adjacent motion morphemes are often treated as a type of resultative verbal compound (Li and Thompson 1981, among many others). For instance, in (2a) and (2b), the second motion morpheme *liao* 'fall' and *jin* 'enter' are understood as the results of the event of rolling.

- (2) a. buduan you xuanshi gun-liao
continuously have hanging-stone roll-fall
'There were hanging stones continuously rolling and falling.' (PKU Corpus)
- b. qiche gun-jin-le shangou
car roll-enter-ASP valley
'The car rolled into the valley.' (PKU Corpus)

However, the two resultative morphemes in (2), *liao* 'fall' and *jin* 'enter', can also occur together, and when they do so, only *liao* 'fall' can precede *jin* 'enter', but not vice versa, as in (3). Therefore, a more fine-grained account is necessary for the relation and distribution of the resultative motion morphemes.

- (3) a. yi-kuai shizi luo-jin-le shui-li
one-CLF pebble fall-enter-ASP water-inside
'A pebble fell into the water.' (PKU Corpus)
- b. *jin-luo shui-li
enter-fall water-inside

24.1.2 Multimorpheme Motion Constructions with a Temporally Sequential Relation

Tai (1985) and Li (1993) propose that, in Chinese, the order of two syntactic units follows the temporal order of the (sub)events they denote. The proposal holds for two units with a temporally sequential relationship. For instance, *lei-ku* (tired-weep) describes a situation in which a person weeps as a result of being tired, whereas *ku-lei* (weep-tired) describes a situation in which a person becomes tired as a result of weeping (Li 1993). However, it is unable to explain MMCs where the motion morphemes denote simultaneous subevents. For instance, a person can run and ascend stairs at

the same time, especially if the person stands at the lower ends of the stairs before the motion, as in (4).

- (4) a. *ta pao-shang lou*
 he run-ascend stairs
 'He went up the stairs running.'
 b. **ta shang-pao lou*
 he ascend-run stairs

This chapter introduces an alternate approach from the perspective of the syntax-semantics interface that can better capture the encoding of motion events in Chinese. The approach investigates the possible types into which Chinese motion morphemes can fall, as well as the semantic relationships and relative order between the motion morphemes of different types.

24.2 A FINE-GRAINED CLASSIFICATION OF CHINESE MOTION MORPHEMES

This section first reviews the traditional two-way classification of motion morphemes by Talmy (2000). Then it introduces a more fine-grained four-way classification based on "scale structure" (Kennedy and McNally 2005; Rappaport Hovav and Levin 2010) and shows that, following the latter approach, Chinese motion morphemes can be classified into four types (Lin 2011; Lin and Peck 2011). A set of diagnostics is also introduced to determine into which type each Chinese motion morpheme falls.

24.2.1 Two-Way Classification of Motion Morphemes

Motion morphemes are traditionally classified into two types by Talmy (2000). One type is a manner-of-motion morpheme that specifies how a motion event is carried out (e.g., *fei* 'fly', *gun* 'roll'). The other is a path morpheme that specifies in which direction a motion event is carried out (e.g., *lao* 'fall', *jin* 'enter'). In Chinese, when a manner-of-motion morpheme and a path morpheme occur together, the former must precede the latter, as in (2). However, as illustrated in (3), the two path morphemes *lao* 'fall' and *jin* 'enter' can occur together, and *lao* necessarily occurs before *jin*. Therefore, the two-way classification is unable to account for the order of these two co-occurring path morphemes. In addition, no systematic criteria are proposed in previous work to distinguish the two types and, thus, some motion morphemes are classified in different ways by different linguists. For example, *diao* 'fall' and *zuan* 'squeeze/get into' are manner-of-motion morphemes according to Chen and Guo (2009) but path morphemes according

to Lamarre (2008). Therefore, a more fine-grained classification of motion morphemes based on reliable and systematic criteria is required.

24.2.2 Four-Way Classification of Motion Morphemes

Rappaport Hovav and Levin (2010) propose that motion verbs and change-of-state verbs can be classified into four types according to the verbs' scale structure. A scale is composed of a set of ordered points or intervals indicating measuring values on a dimension (e.g., height, distance, or temperature; Kennedy and McNally 2005; Rappaport Hovav 2008; Rappaport Hovav and Levin 2010, among others). In the domain of motion, a scale is understood on the dimension of distance, that is, the distance of the moving object with respect to the reference object, and the scale is composed of points that are "a set of contiguous locations which together form a path" and are ordered in the direction of movement (Rappaport Hovav and Levin 2010:29). For instance, the points in the scale lexicalized in *descend* are ordered in the direction of the reference object, gravity, whereas the points in the scale of *recede* are ordered in a direction from the reference object, that is, the starting point of the receding event. The moving object's location on the path represents a value for its distance with respect to the reference object; when the moving object changes its location along the path, the value changes too, so the change is understood as a scalar change that is measurable on the dimension of distance (Rappaport Hovav and Levin 2010).

A scale has three properties that classify motion morphemes into four types (Rappaport Hovav and Levin 2010): The first property is existence of a scale, that is, whether the motion takes place along a scale, which classifies motion morphemes into scalar change motion morphemes (e.g., *recede*, *return*, *enter*) and nonscalar change motion morphemes (e.g., *fly*, *walk*); The second property is boundedness, that is, whether a scale has an endpoint, which further divides scalar change motion morphemes into open scale motion morphemes (e.g., *recede*, *ascend*) and closed scale motion morpheme (e.g., *return*, *enter*); The third property is punctuality, that is, whether motion along a scale is durative (with multiple points) or punctual (with two points, i.e., the starting and ending points), and it divides closed scale motion morphemes into multipoint closed scale motion morphemes (e.g., *return*, *come*) and two-point closed scale motion morphemes (e.g., *enter*, *arrive*). Of the four types, nonscalar change motion morphemes are equivalent to Talmy's manner-of-motion verbs, whereas the other three types are a further classification of Talmy's path verbs, as illustrated in Figure 24.1.

Following Rappaport Hovav and Levin (2010), Lin (2011) and Lin and Peck (2011) also classify Chinese motion morphemes into four types, as in Table 24.1.

24.2.3 Diagnostics of the Four-Way Classification of Chinese Motion Morphemes

This section introduces a set of independent diagnostics proposed by Lin (2011) and Lin and Peck (2011) in determining into which type each Chinese motion morpheme falls.

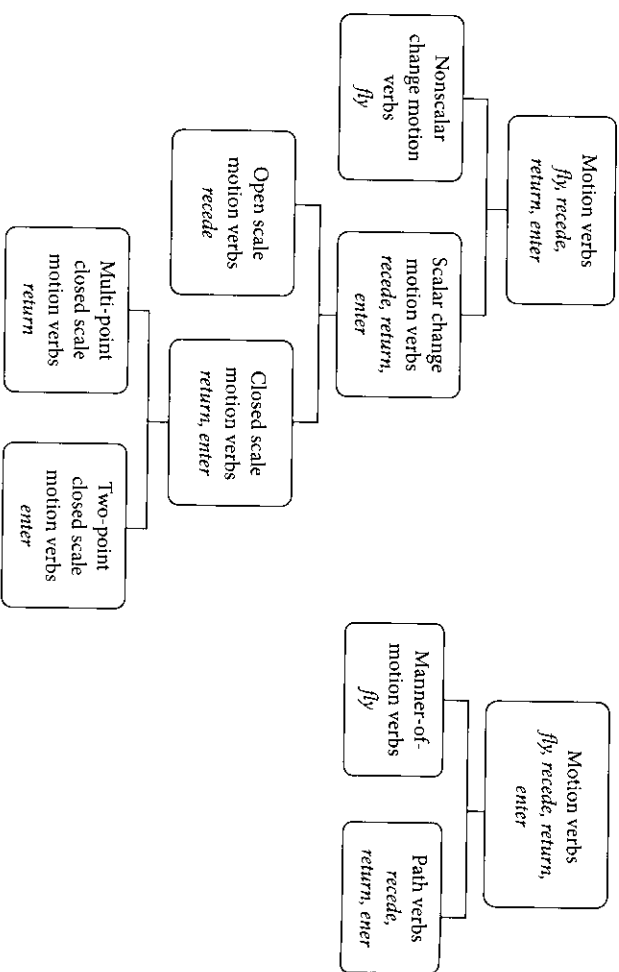


FIGURE 24.1 Classification of English motion verbs

(a) Four-way classification of English motion verbs based on Rappaport Hovav and Levin (2010)
 (b) Two-way classification of English motion verbs based on Talmy (2000)

Table 24.1 Three scalar properties determine four types of Chinese motion morphemes

| Types of motion morphemes | Existence of a scale | Boundedness | Punctuality |
|---|----------------------|-------------|-------------|
| Non-scalar change morpheme (<i>fei</i> 'fly') | - | - | - |
| Open scale morpheme (<i>tui</i> 'recede') | + | - | - |
| Multipoint closed scale morpheme (<i>hui</i> 'return') | + | + | - |
| Two-point closed scale morpheme (<i>jin</i> 'enter') | + | + | + |

24.2.3.1 Differentiating Scalar Change from Non-scalar Change Motion Morphemes

Rappaport Hovav and Levin (2010) point out that, unlike scalar change motion morphemes, a non-scalar change motion morpheme does not lexically specify a change of location on a particular direction or denote a delimited motion event, so it is compatible with any phrases that express possible results brought about by the action denoted by the morpheme. For instance, *pao* 'run' allows bare XP resultative complements and non-subcategorized objects with result XPs predicated of them.

- (5) a. *ta pao-lei le*
 he run-tired ASP
 'He was tired as a result of running.'
 b. *ta pao-diu-le xiezi*
 he run-lose-ASP shoe
 'He lost his shoes as a result of running.'
 c. *ta pao-dao-le xuexiao*
 he run-arrive-ASP school
 'He ran to the school.'

In contrast, a scalar change motion morpheme specifies a change of location in a particular direction, which can be understood as a kind of result³; thus such a morpheme cannot combine with a variety of result phrases, but only those that are associated to the path of motion denoted by the morpheme, particularly phrases that further specify the path or specify an endpoint for the path (Rappaport Hovav 2008). As illustrated in (6), *hui* 'return' is compatible with a phrase denoting the endpoint of the event of returning (i.e., 'the base'); although the moving objects can become tired or lose a weapon in the motion, no phrases denoting such states are allowed to co-occur with *hui*.

- (6) a. *diren hui-dao-le jidi*
 enemy return-arrive-ASP base
 'The enemy returned to the base.'
 b. **diren hui-lei le*
 enemy return-be-tired ASP
 'The enemy were tired as a result of returning.'
 c. **diren hui-diu-le wuqi*
 enemy return-lose-ASP weapon
 'The enemy lost their weapon as a result of returning.'

24.2.3.2 Differentiating Closed-Scale from Open-Scale Motion Morphemes

According to Rappaport Hovav and Levin (2010), scalar change motion morphemes can be classified into closed- and open scale motion morphemes depending on whether the scale lexicalized by a given scalar change motion morpheme has an endpoint. A motion event with a closed scale does not allow the moving object to progress beyond the endpoint. For instance, "school" is the endpoint of the event in *John came to the school at 8 am*, so the event of coming is completed once John arrives at the school. In contrast, a moving object on an open scale does not have an endpoint at which to arrive. For instance, in an event denoted by the verb *ascend*, a

moving object can potentially move upward forever if there is no bound explicitly specified.

In Chinese, comparison can be expressed by a *geng* 'more' phrase, for example, *geng yuan* (more far) 'further', *geng gao* (more high) 'higher'. If a scalar change motion morpheme is compatible with the *geng* comparative, the morpheme has an open scale in that it allows a moving object to move further along the scale; otherwise, it has a closed scale. As illustrated in (7), *sheng* allows the *geng* comparative, whereas *hui* 'return' does not.

- (7) a. qiqiu 5-fenzhong-qian jiu xiang shang sheng le,
balloon 5-minute-before then toward up ascend ASP
xianzai sheng de geng gao le
now ascend MOD more high PRT
'The balloon began ascending five minutes ago; now it has gone up higher.'
- b. ta 5-fenzhong-qian jiu hui jia le, *xianzai hui de geng yuan
le
he 5-minute-before then return home ASP now return MOD more far
PRT
'He began returning home five minutes ago; #now he has returned farther.'

24.2.3.3 Differentiating Multipoint Closed from Two-Point Closed-Scale Motion Verbs

Closed scale motion morphemes can be further classified into multipoint and two-point closed scale motion morphemes depending on the length of the path in a motion event (Beavers 2008; Rappaport Hovav and Levin 2010, among others). According to Beavers (2008), the scale of a two-point closed scale motion morpheme such as *arrive* and *enter* is associated with only two values, that is, being at an endpoint or not, and the transition from one point to the other is usually understood as instantaneous; in contrast, the scales of multipoint closed scale motion morphemes (e.g., *return* and *come*) are composed of a starting point and an endpoint, as well as many points in between. In this sense, although motion along a multipoint closed scale is also telic, that is, there exists an endpoint for the motion, the motion is gradual and takes time, and thus the event is durative. Therefore, a moving object can stop for a while before it arrives at the endpoint on a scale with multiple points but not on a two-point scale (Beavers 2008). As illustrated in (8), the motions denoted by *hui* 'return' allow a moving object to stop on the scale, whereas *jin* 'enter' does not.

- (8) a. ta hui sushe hui-le yiban tingxia-le
he return dorm return-ASP half stop-ASP
'He returned halfway to the dorm and stopped.'
- b. *ta jin fangjian jin-le yiban tingxia-le
he enter room enter-ASP half stop-ASP
'*He entered the room halfway and stopped.'

Table 24.2 Examples of Chinese motion morphemes of different scalar types

| Types | Non-scalar change motion morphemes | Open scale motion morphemes | Multipoint closed scale motion morphemes | Two-point closed scale motion morphemes |
|------------------------|--|--|--|--|
| Free motion morphemes | <i>pao</i> 'run' <i>fei</i> 'fly' <i>zou</i> 'walk' <i>chong</i> 'rush' <i>liu</i> 'flow' <i>piao</i> 'drift' etc. | <i>sheng</i> 'ascend' <i>jiang</i> 'descend' <i>luo</i> 'fall' <i>tui</i> 'recede' <i>shang</i> 'ascend' <i>xia</i> 'descend' etc. | <i>hui</i> 'return' <i>lai</i> 'come' <i>qu</i> 'go' <i>guo</i> 'cross' etc. | <i>jin</i> 'enter' <i>chu</i> 'exit' <i>guo</i> 'cross' <i>dao</i> 'arrive' etc. |
| Bound motion morphemes | <i>xiang</i> 'fly' <i>ben</i> 'run' <i>xing</i> 'walk' etc. | <i>che</i> 'recede' <i>qi</i> 'rise' <i>duo</i> 'fall' etc. | <i>yue</i> 'cross' <i>gui</i> 'return' <i>fan</i> 'return' etc. | <i>yue</i> 'cross' <i>ru</i> 'enter' <i>zhi</i> 'arrive' etc. |

The diagnostics are expected to be able to determine the scalar type into which each individual motion morpheme falls (Lin 2011; Lin and Peck 2011). Lin (2011) also observes that in the same scalar type, a few motion morphemes may be less prototypical than the others. For example, *guo* 'cross' does not specify the duration of the motion; rather, the duration is determined by its complement: the event of crossing is durative if the location has a long path (e.g., a long bridge) but punctual if the path is sufficiently short (e.g., a police line drawn on the ground). Therefore, *guo* can be understood either as a multipoint or two-point closed scale motion morpheme. Other examples that require special attention include *shang* 'ascend' and *xia* 'descend'. The two morphemes are identified as open scale motion morphemes according to the diagnostics, but while all other morphemes of the same type (e.g., *tui* 'recede', *luo* 'fall') cannot or do not take complements directly, *shang/xia* usually require a location NP complement or are followed by *lai/qu* 'come/go', for example, *shang erlou* (ascend second-floor) 'go up to the second floor', *xia-lai* (descend-come) 'go down to the delictic center'. Despite these distributional differences, the proposed diagnostics are able to classify all Chinese motion morphemes into the four scalar types. Furthermore, the diagnostics can also be applied to bound motion morphemes, that is, morphemes that are no longer used as independent verbs in Modern Chinese (e.g., *ru* 'enter', *fan* 'return'; Lin 2011). Table 24.2 provides a list of Chinese free and bound motion morphemes classified into different scalar types.

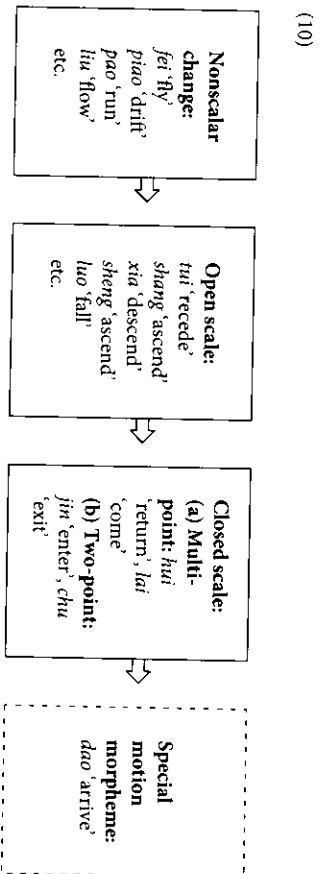
24.3 HIERARCHY PREDICTING THE ORDER OF MOTION MORPHEMES

The number of motion morphemes in Chinese MMMCs typically range from two (9a) to three (9b).⁴

- (9) a. women *zou-jin-le* DingZuoming *de* *jia*
 we walk-enter-ASP DingZuoming POSS home
 'We walked into Ding Zuoming's home.' (PKU Corpus)
- b. *yime* *xuehua* *cong* *kong-zhong* *piao-luo-dao* *dimian*
 one-CLF snowflake from sky-inside drift-fall-arrive ground
 'A snowflake drifts and falls on the ground from the sky.' (PKU Corpus)

Many MMMCs are found to end with *lai* 'come' or *qu* 'go', for example, *pao-jin-fangjian-lai* (run-enter-room-come) 'run into the room (toward the deictic center)', *piao-luo-hui-qu* (drift-fall-return-go) 'drift and fall back (toward the deictic center)'. However, as Lin (2011) argues, although *lai* 'come' and *qu* 'go' are multipoint closed scale motion morphemes according to the diagnostics, when occurring in constructional-final position, they are not typical motion morphemes in that they no longer possess scalar properties such as telicity and duration. Rather, the telicity and duration of a motion event is determined by the motion morphemes preceding *lai/qu*; for example, the motion event is atelic if the preceding motion morpheme is atelic and punctual if the preceding morpheme is punctual. In this sense, *pao-jin-fangjian-lai* (run-enter-room-come) and *piao-luo-jin-lai* (drift-fall-enter-come) are treated as two-morpheme and three-morpheme MMMCs, respectively. The Motion Morpheme Hierarchy proposed to predict the order of motion morphemes does not take into account the constructional-final *lai/qu*.

Example (10) is the Motion Morpheme Hierarchy consisting of the four types of motion morphemes.



When semantically compatible motion morphemes from different classes co-occur, they will be ordered from left to right according to the hierarchy in (10). Because a multipoint and a two-point closed scale motion morpheme usually do not occur together in a motion construction and both occur in the same position in sequences of multiple motion morphemes, these two types are grouped together as one (i.e., closed scale motion morphemes) in the hierarchy. In addition, the two-point closed scale motion morpheme *dao* 'arrive' is treated as a special motion morpheme and positioned in the rightmost of the hierarchy because it does not behave exactly with other motion morphemes such as *jin* 'enter' and *chu* 'exit' from the same type. The rest

of this section explains the hierarchy in more detail, from two-morpheme MMMCs to three-morpheme MMMCs.

In two-morpheme MMMCs, the first morpheme must come from a type that is located to the left of the type where the second morpheme comes from. For instance, nonscalar change motion morphemes occupy the leftmost position of the hierarchy in (10). Therefore, a morpheme such as *fei* 'fly' from this type is predicted to precede any semantically compatible motion morphemes that belong to the other types in the hierarchy. Example (11) provides samples of *fei* preceding the open scale motion morpheme *tui* 'recede', the multipoint closed scale motion morpheme *hui* 'return', the two-point closed scale motion morpheme *jin* 'enter', and the special motion morpheme *dao* 'arrive', whereas the reverse orders are not acceptable.

- (11) a. *xiang* *hou* *fei-tui* *de* *huangtu*
 toward back fly-recede REL yellow.dust
 'the yellow dust that is flying back' (PKU Corpus)
- b. *yey* *gang* *fei-hui* *beifang*
 wild.duck just fly-return north
 'The wild ducks just flew back to the north.' (PKU Corpus)
- c. *yizhi* *yanzi* *fei-jin* *jiaoshi*
 one.CL swallow fly-enter classroom
 'A swallow flew into the classroom.' (PKU Corpus)
- d. *naqun* *xiaoniao* *fei-dao* *shu-shang*
 that.group little.bird fly-arrive tree-on
 'That group of birds flew onto the tree.' (PKU Corpus)

Similarly, the class of open scale motion morphemes is located to the left of the class of closed motion morphemes (both multipoint and two-point) and *dao* 'arrive'. Therefore, an open scale motion morpheme (e.g., *tui* 'recede') is predicted to precede morphemes from the latter, whereas the reverse orders are not allowed.

- (12) a. *jundui* *tui-hui* *Shaanxi*
 army recede-return Shaanxi
 'The army receded back to Shaanxi.' (PKU Corpus)
- b. *Lulu* *manman* *tui-jin-le* *liwu*
 Lulu slowly recede-enter-ASP back.room
 'Lulu slowly receded into the back room.' (PKU Corpus)
- c. *qiuyuan* *tui-dao-le* *chang-wai*
 player recede-arrive-ASP court-outside
 'The players receded outside of the court.' (PKU Corpus)

Finally, as the hierarchy predicts, although closed scale motion morphemes usually do not co-occur, most of them can occur before the special motion morpheme *dao* 'arrive,' as in (13).⁵

- (13) a. women *hui-dao* Shucun
 we return-arrive tree.village
 'We returned to Tree Village.' (PKU Corpus)
- b. Du.Xin jin-dao fangjian-li
 Du.Xin enter-arrive room-inside
 'Du Xin went into the room.' (PKU Corpus)

In a three-motion morpheme construction with each coming from a different class in the hierarchy, the order of the three morphemes also follows the hierarchy. For instance, the three morphemes, *piao* 'drift', *liao* 'fall', and *dao* 'arrive', in (9b), conform to the hierarchy in the order nonscalar change motion morpheme > open scale motion morpheme > special motion morpheme *dao* 'arrive.'

Note that there is a type combination of motion morphemes whose order is not predicted by the Motion Morpheme Hierarchy (cf. Lin 2011): *tui-shang* (recede-ascend) and *tui-xia* (recede-descend). The two morphemes in each combination are from the same scalar type, that is, open scale motion morphemes, but they denote different information of motion and have a fixed order that is not predicted by the hierarchy. We come back to them in Section 24.4.

The Motion Morpheme Hierarchy is found valid with a large range of data in two corpus studies by Lin (2011). The first study investigated 263 two-morphemes found in selected chapters of four Chinese novels. Only one exception was found, but it was proven to be a misuse by the writer. The second study selected two, in some cases three, most frequently used motion morphemes of each scalar type in the first corpus study and examined their distribution in the novels of the PKU Corpus. Here 1,242 two-morpheme MMMCs were found in the corpus. All were consistent with the hierarchy, except for nineteen instances where *tui* 'recede' preceded *xia* 'descend', which is an exception to the proposed hierarchy and will be discussed in Section 24.4. In addition, the two studies found only twelve three-morpheme MMMCs, but all of them are consistent with the hierarchy.

24.4 THE "SCALAR SPECIFICITY CONSTRAINT"

This section discusses why the hierarchy emerges, why two closed scale motion morphemes usually do not co-occur, as well as the *tui-shang/xia* (recede ascend/descend) exceptions.

Lin (2011) proposes the Scalar Specificity Constraint to account for the hierarchy: the morpheme that is less specific about the scale in a motion event must precede the

morpheme with more specific scalar information. In terms of degree of specification about a scale, nonscalar change motion morphemes (e.g., *gun* 'roll') do not provide any information about the scale, open scale motion morphemes (e.g., *liao* 'fall') specify the existence of a scale, whereas (both multipoint and two-point) closed scale motion morphemes such as *hui* 'return' and *jin* 'enter' specify not only the existence of a scale but also the existence of an endpoint for the scale. Therefore, the fact that Chinese motion morphemes follow an order as represented by the three boxes with solid-line borders in (10) is consistent with the Scalar Specificity Constraint.

In contrast, a two-point closed scale motion morpheme (e.g., *jin* 'enter') is not more specific than a multipoint closed scale motion morpheme (e.g., *hui* 'return') in the degree of specification about a scale or vice versa: both specify the existence of a scale as well as an endpoint for the scale. Therefore, conforming to the Scalar Specificity Constraint, two closed scale motion morphemes do not co-occur, as in **tui-jin fangjian* (return-enter room) and **jin-hui fangjian* (enter-return room). This explains why the two types of morphemes are grouped together in (10).

The Scalar Specificity Constraint also explains why the open scale motion morphemes *tui* 'recede' and *shang/xia* 'ascend/descend' can co-occur and the former precedes the latter. As mentioned in Section 24.3, unlike other open scale motion morphemes, *shang/xia* require explicitly expressed information about the reference object, either via a locative NP complement or the constructional-final *lai/qu*, which thus help delimit the event of ascending/descending. For instance, although *shang* denotes an ascending event that is defaultly unbound, the NP complement such as *erlou* 'second floor' required by *shang* 'ascend' delimits the ascending event, so it ends at the second floor; similarly, *lai* 'come' in *xia-lai* (descend-come) delimits the descending event at the deictic center. Therefore, compared with *tui* 'recede', *shang/xia* and their complements are more specific about the scale of motion, and thus the existence of "*tui* + *shang/xia* + location NP/*lai/qu*" conforms to the constraint.

However, the Motion Morpheme Hierarchy shows that the two-point closed scale motion morpheme *dao* 'arrive' can follow other closed scale motion morphemes, as in *hui-dao fangjian* (return-arrive room) 'return to the room' and *jin-dao fangjian* (enter-arrive room) 'enter the room', whereas other two-point closed scale motion morphemes cannot (e.g., **hui/lai-jin fangjian*, 'return/come-enter room'). In terms of the degree of specification of scale information, *dao* 'arrive' is as specific as other two-point closed scale motion morphemes, that is, they all specify the existence of a scale, as well as the existence of an endpoint for the scale. Therefore, the fact that *dao* 'arrive' can follow closed scale motion morphemes represents an exception to the Scalar Specificity Constraint.

24.5 CONCLUSION

This chapter describes the relative order of motion morphemes that co-occur in Chinese directed motion constructions within the context of the scale structure approach. The

approach provides a fine-grained analysis of the semantic relationships between these morphemes in Chinese MMMCs.

NOTES

1. Previous studies disagree on the grammatical status of the morphemes that express motion in Chinese. The term "motion morpheme" is used to cover all Chinese morphemes expressing motion because the approach introduced in this chapter can be applied to morphemes of different kinds of grammatical status, including independent motion verbs, path satellites, and even bound motion morphemes that cannot be used alone as verbs in Modern Chinese.
2. Abbreviations: ASP = aspect marker; CLF = classifier; POSS = possessive marker; REL = relative clause marker. PKU Corpus refers to the corpus of Modern Mandarin Chinese constructed by the Center for Chinese Linguistics at Beijing University. The corpus has 307,317,060 characters updated on July 20, 2009. See <http://cccl.pku.edu.cn/>.
3. Rappaport Hovav and Levin (2010) point out that path verbs, that is, scalar change motion verbs, are result verbs. See more discussion in Rappaport Hovav and Levin (2010).
4. MMMCs with more than three motion morphemes are rarely found. There are cases in which multiple morphemes are used together, as the five morphemes in (i). However, these morphemes are actually from two independent MMMCs, *tiao-chu-lai* (jump-exit-come) and *zou-jin...* *lüdian* (walk-enter... hotel), because a pause or conjunction can be inserted in between them.

(i) Puxijin tiao chu-lai zou-jin-le lu-pang de-yi-jia xiao lüdian
 Pushkin jump exit-come walk-enter-ASP road-side REL one-CLF small hotel
 'Pushkin jumped out; walked into a small hotel on the roadside.' (PKU Corpus)

In addition, this study does not cover the type of compounds consisting of two synonymous motion morphemes, for example, *ben-pao* (run-run) 'run', *fan-hui* (return-return) 'return', *jin-tu* (enter-enter) 'enter'. These compounds are structurally different from MMMCs; see more in Lin (2011).

5. *Chu-dao* exit-arrive rarely occurs probably because usually, *chu* takes a source NP complement whereas *dao* takes a goal NP complement.

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CHAPTER 25

PROFILING THE MANDARIN SPOKEN VOCABULARY BASED ON CORPORA

HONGYIN TAO

25.1 INTRODUCTION

As one of the major components of language, vocabulary is among the least studied areas of language. This is mainly due to the fact that vocabulary is usually thought to consist of individual words and thus lacks systematicity. However, research has shown that vocabulary, or the lexicon, is no less systematic than other components of language, and findings from the vocabulary can offer many insights into the organization of language. An even more neglected area of research is perhaps the vocabulary of the spoken language. In the vast collection of a Chinese academic publications database, the CNKI full text database (www.cnki.net), there were fewer than thirty titles found to be somewhat associated with the keywords *kouyu cihui* (口语词汇: spoken vocabulary, accessed on March 23, 2012). As a corollary, there are well-known spoken grammars of Chinese (e.g., Chao 1968) yet very little in the way of spoken vocabulary, except for a few dictionaries (e.g., Fu and Gao 1986; Xu 1991; Chen et al. 1997; Song 1987), monographs (e.g., Yip 2000), and edited volumes (e.g., Chen 1989). This lack of interest can almost certainly be attributed to some of the longstanding biases against both the spoken language and vocabulary. A typical stereotype of spoken language, for example, is that it is full of disfluency and errors and is thus not suitable for investigating linguistic competence (Chomsky 1965:4).

Some of the earlier studies on spoken vocabulary, which is generally rare for Mandarin Chinese, suffer from the lack of spontaneous data. For example, in a brief sketch of the lexicon of spoken Mandarin, Cao (2003) collected entries marked as colloquial expressions in the *Modern Chinese Dictionary* (*Xiandai Hanyu Cidian*) as the basis for investigating syllable counts of the spoken vocabulary, an approach also accepted by

Yip (2000). As I show in Section 25.5.3, however, this is hardly a viable method for such a task.

Recently, with the availability of electronic corpora, research in vocabulary has seen much advancement (Nation 1990; McCarthy 1999; McCarthy and Carter 2003; Adolphs and Schmitt 2003; O'Keefe et al. 2007; Xiao et al. 2009). For example, we now have a better grip on the distribution of lexis, where some lexical types are found to be much more frequent than others; we also know that frequency has much to do with the likelihood and ways that meaning and form of a word can change. Such findings throw new light on the structure of language and have important implications for the various applied fields such as language learning and teaching and computational processing of language.

In this chapter, I describe some of the most salient properties of the spoken vocabulary as seen in spoken corpora and attempt to offer an account of the ways Mandarin vocabulary is organized.

25.2 DATA

For this study, two sets of conversation data were used. The main corpus consists of fifty-four face-to-face conversations between friends and family members, recorded between the 1980s and 2005. This set of data was used for the first study reported in Sections 25.3 and 25.4, which were also reported in Tao (2009). The second set of data is a subset of the main database (minus four conversations that have extensive monologs) but received better parts of speech coding (i.e., with more manual correction of parts of speech information) than the initial data set. This subset of data was used for the discussion in Section 25.5.

Both sets of data were word-segmented and tagged for parts of speech information by the software program ICTCLAS (see Xiao et al. 2009:3–4 for a description), which uses algorithms based on statistical models. A total of 344,141 words were identified by the program.

In what follows, I present some of the most salient properties of the spoken lexicon based on these data.

25.3 SKEWED DISTRIBUTION PATTERNS

A search of the main corpus shows that there is a general dominance of a small number of lexical types in the corpus. Here a type is taken to be a unique word as identified by the ICTCLAS program, while a token is any occurrence of the type in the corpus. From this

Table 25.1 Type-token distribution: Top 100 vs. the rest

| Type | Token | Proportion of tokens in corpus |
|----------------|----------------|--------------------------------|
| High frequency | Top 100 | 268,979 |
| Low frequency | Below top 100= | 16,940 |
| | | 75,162 |
| | | 22% |
| Total | 17,040 | 344,141 |
| | | 100% |

point of view, the data show that the top 100 types account for near 80% of the running words.

This finding is clearly in line with Zipf's (1935) observation of Beijing Mandarin and other languages. As early as the 1930s, George Zipf had made important observations about statistical distributional properties of the lexicon, widely known as Zipf's Law, namely: (a) a small number of lexical items have very high frequencies in natural texts and (b) in general the magnitude of words tends to stand in an inverse relationship to the number of occurrences.

Our results also support some earlier corpus-based studies of Chinese. Chang (1989:49), for example, notes that while the dominance of a few word types can be observed in written Chinese, in spoken Chinese this tendency is even stronger. By his account, the top 4,000 high-frequency words in the spoken corpus account for 96.65% of his data (0.16 million words or 20 million characters), and the top 1,000 words have 6% to 12% higher frequency rates than the same top tokens in the two written corpora (journalistic and academic; Chang 1989:49). Similar results were reported for Singapore Mandarin (Wang 2011). English, and many other languages in numerous recent corpus-based studies (see, e.g., Adolphs and Schmitt 2003; O'Keefe et al. 2007).

25.4 HIGH-FREQUENCY LEXIS TYPES

When we look at the lexical categories of the high-frequency items, it is also interesting to see the heavy concentration of certain types over others. O'Keefe et al. (2007:37) show that in spoken (British) English, the major categories are modal items (*will, look, seem, etc.*), delexical verbs (*do, make, etc.*), and some others types. For Mandarin, Tseng (2001:168; 2006:104) identifies thirty-six high-frequency words as part of the core vocabulary on the basis of a small sample (fewer than 10,000 words) of spoken Chinese.

For ease of presentation, here I select only the top fifty-plus items, which are listed in Table 25.2. As can be seen from the raw frequencies, a few major groups emerge, with some overlapping with those on Tseng's list (in boldface) and others not. Excluding

Table 25.2 Top 50 plus high-frequency words in the corpus

| | | | | | |
|--------|-------|--------|------|--------|------|
| 1) 的 | 13245 | 19) 那个 | 3154 | 37) 到 | 1666 |
| 2) 是 | 12047 | 20) 然后 | 3076 | 38) 她 | 1606 |
| 3) 我 | 10052 | 21) 在 | 3067 | 39) 没 | 1590 |
| 4) 就 | 7782 | 22) 什么 | 3064 | 40) 吧 | 1539 |
| 5) 不 | 7743 | 23) 这 | 3027 | 41) 多 | 1490 |
| 6) 你 | 7658 | 24) 这个 | 2772 | 42) 它 | 1474 |
| 7) 了 | 7484 | 25) 很 | 2373 | 43) 没有 | 1438 |
| 8) 那 | 6846 | 26) 哦 | 2245 | 44) 得 | 1412 |
| 9) 啊 | 5792 | 27) 看 | 2197 | 45) 呢 | 1384 |
| 10) 个 | 4696 | 28) 人 | 2100 | 46) 跟 | 1336 |
| 11) 他 | 4385 | 29) 还 | 2093 | 47) 他们 | 1335 |
| 12) 对 | 4285 | 30) 嘿 | 1953 | 48) 儿 | 1326 |
| 13) 就是 | 3920 | 31) 好 | 1939 | 49) 上 | 1235 |
| 14) 有 | 3816 | 32) 要 | 1871 | 50) 吗 | 1200 |
| 15) 都 | 3760 | 33) 我们 | 1847 | 51) 现在 | 1176 |
| 16) 说 | 3677 | 34) 去 | 1824 | 52) 知道 | 1135 |
| 17) 一 | 3497 | 35) 一个 | 1814 | 53) 嘛 | 1112 |
| 18) 也 | 3186 | 36) 觉得 | 1694 | 54) 但是 | 1082 |

the ubiquitous multipurpose structural marker 的 *de*, an initial taxonomy of the core vocabulary can be established as follows.

- (1) Pronouns: 我 *wo* 'I', 你 *ni* 'you', 他 *ta* 'he'
- (2) Low content verbs: 是 *shi* 'be', 有 *you* 'have'
- (3) Speech act verbs: 说 *shuo* 'say'
- (4) Cognitive verbs: 觉得 *juede* 'feel', 知道 *zhidao* 'know', 看 *kan* 'see, think'
- (5) Motion verbs: 去 *qu* 'go', 到 *dao* 'go to', 上 *shang* 'get'
- (6) Adverbs: 就 *jiu* 'then', 就是 *jushi* 'then', 都 *dou* 'all', 也 *ye* 'also', 很 *hen* 'very', 还 *hai* 'also'
- (7) Numeral/classifiers: 一 *yi* 'one', 一个 *yige* 'one'
- (8) Modal expressions: 要 *yao* 'would, will, should'
- (9) Negation: 不 *bu* 'not', 没有 *meiyou* 'not have'
- (10) Deixes: 这 *zhe* 'this', 这个 *zhege* 'this one', 那 *na* 'that', 那个 *nage* 'that one'
- (11) Temporal deictic: 然后 *ranhou* 'then', 现在 *xianzai* 'now'
- (12) Reactive tokens: 哦 *o*, 嗯 *en*, 啊 *a*, 对 *dui*
- (13) Particles: 吧 *ba*, 呢 *ne*, 嘛 *ma*, 啊 *a*
- (14) Interrogatives: 什么 *shenme* 'what'
- (15) Conjunctions: 所以 *suoyi* 'so', 而且 *erqie* 'and', 但是 *danshi* 'but'
- (16) General nouns: 人 *ren* 'person'
- (17) Basic adjectives: 好 *hao* 'good'

25.5 CHUNKING AND THE ISSUE OF LEXICAL UNITS

25.5.1 Observations

If, as the results indicate, a limited number of words are doing most of the work in spoken communication, we need to explore the hitherto unanswered question: how is this possible? Especially intriguing are the following properties that can be detected from the data:

- Many of the core vocabulary items are not real lexical or high-content words. This is illustrated by words such as copula verbs, negation markers, and general nouns.
- Most of them cannot stand alone. This is illustrated by words such as conjunctions, particles, and adverbs. One cannot typically make up an utterance with these words alone, as they rely heavily on the context provided by other words and expressions.

Given these facts, why then would these lexical items be so frequent and be able to make up much of the talk/text?

While there are no quick answers to these questions, and a full-fledged study is certainly beyond the scope of this chapter, we can at least explore some possibilities from the points of view discussed in the following sections.

25.5.2. A Proposal

In contrast with the dominant approach to meaning and vocabulary that emphasizes the single lexical words as a unit of meaning (see, e.g., Chao, 1968), I propose that the key to a proper understanding of the puzzles presented in the quantitative data is to look beyond the single words and take multiword units as a valid unit of meaning (Sinclair 1991, 1996; Tao 2009). That is, in addition to the meanings and grammatical patterns typically found in dictionary definitions and grammatical descriptions of individual words, most of these lexical items have special collocation patterns, constituting fixed or semifixed expressions. Often they combine with one another and give rise to the high-frequency status. In the following I present corpus data to illustrate this point.

25.5.3. Syllabic Composition of Mandarin Words

Before exploring the issue of chunking and lexical units, let us take a quick look at the issue of syllabic composition (i.e., syllable counts) of words in spoken Mandarin.

Syllabic composition has been a hotly contested issue in Chinese lexicology and lexicography. The main reason for this is that Mandarin has undergone radical phonological changes over the millennia, as has the syllable structure of Mandarin words. In regard to the typical syllable counts of words in Modern Chinese, scholars generally agree that there is a tendency toward disyllabification or polysyllabification, whereby monosyllabic words are replaced with two or more syllables as morphemic units. However, scholars differ in their estimates of the ratio of disyllabic and polysyllabic units in Modern Chinese. For example, Cao (2003), based on entries in the *Modern Chinese Dictionary*, claims that in the spoken vocabulary, about 13% are monosyllabic, 68% disyllabic, and 19% polysyllabic. Yip (2000:18), based on Liu's (1973) *Frequency Dictionary of Chinese*, reports that 2,076 out of the 3,000 entries are nonmonosyllabic, with 2,047 being disyllabic, which suggests that 924 or 30% are monosyllabic, 68% disyllabic, and 2% polysyllabic, a result that, though varying from Cao's counts, is still compatible with the overall tendency described in Cao (2003).

However, it should be noted that both of these counts have obvious flaws in methodology, as both used dictionary entries as the basis for counting rather than relying on natural text information. In fact, when corpus data are examined, the results are usually quite different. For example, Chang (1989), in a description of the corpus-based frequency dictionary (Beijing: Yuyan Xueyuan, 1986), reports that the average word length in modern Chinese is between 1.2 and 2 characters/syllables. From the point of view of genre distribution, Chang finds that monosyllabic words are most likely appear in spoken discourse (58). And finally, among the top 1,000 overall high-frequency words, monosyllabic words are 2.5 times more common than disyllabic words (57). Similarly, Xiao et al. (2009) reports that while monosyllabic words account for only 7.56% of the word types, they account for a massive 54.08% of the tokens in a corpus of 38 million words. Clearly, both Chang's and Xiao et al.'s corpus-based findings paint a different picture than most of the dictionary-based accounts in that they recognize the important role monosyllabic words play in the Chinese lexicon, especially in the spoken vocabulary.

My analysis of the spoken data shows compatible results with Chang (1989) and Xiao et al. (2009). Note that the spoken data used for this part of the study come from a subset of the main corpus, which receives better parts of speech tagging. My database doubles the size of that of Chang's and differs from Xiao et al. (2009) in containing only spoken data. Here I discuss the results in two groups: the top 1,000 words and the top 100 words. For the top 1,000 words, we can see that the number of the type of monosyllabic words is only slightly less than the type of disyllabic words, while the number of tokens of monosyllabic words is significantly larger than the disyllabic words. See Table 25.3.

If we examine the top 100 words, the prominence of monosyllabic words is even more obvious. See Table 25.4.

As can be seen in Table 25.4, monosyllabic words are dominant in both the number of types and of tokens (70% and 82.3%, respectively). While we are not prepared to go so far as to suggest that the Modern Chinese lexicon is a monosyllabic in nature (cf. Yip 2000:15), the usage-based results at least show that monosyllables are certainly at the top tier of the lexicon in use. This is an important perspective to keep in mind when it comes to evaluating the role of words with different syllable counts in modern Chinese.

Table 25.3 Top 1000 words and syllable count

| | Type | Token |
|--------------|------|-------|
| Monosyllabic | 448 | 44.8% |
| Disyllabic | 499 | 49.9% |
| Polysyllabic | 53 | 5.3% |
| Total | 1000 | 100% |

| | Token | % |
|--------------|---------|-------|
| Monosyllabic | 244,166 | 72.2% |
| Disyllabic | 88,953 | 26.3% |
| Polysyllabic | 4,767 | 1.4% |
| Total | 337,886 | 100% |

Table 25.4 Top 100 words and syllable count

| | Type | Token |
|--------------|------|-------|
| Monosyllabic | 70 | 70% |
| Disyllabic | 30 | 30% |
| Polysyllabic | 0 | — |
| Total | 100 | 100% |

| | Token | % |
|--------------|---------|-------|
| Monosyllabic | 192,955 | 82.3% |
| Disyllabic | 41,387 | 17.7% |
| Polysyllabic | 0 | — |
| Total | 234,342 | 100% |

25.5.4 Lexical Chunks

Having showed that monosyllabic words have a special status in the most active portion of the lexicon, we now turn to a different level to tackle the issue of lexical units in the spoken language: lexical chunks. If we define collocations as units involving two lexical items and chunks as lexical combinations involving at least three words, we can see that in spoken discourse, many chunks frequently form independent units with special meanings differing from the sum of their individual components.

Table 25.5 lists the top fifty three-word chunks in the data.

Most of the individual component words in these clusters are also high-frequency lexemes such as *shi* (是), *bu* (不), *wo* (我), *na* (那), *yi* (一), *jiu* (就), and *de* (的). When they are combined to form clusters, they, much like the individual high-frequency lexemes, can be grouped into a few common types. Here I can discuss only some of the most prominent categories of these chunks.

(1) Meta-linguistic devices for speaker-addressee interaction. These include the yes-no interrogative form *shi bu shi* (是不是), which are often used as frozen expressions distinctive from other A-Not-A questions (Tsai 2011).

| | | |
|-----------------|------|---------------|
| 这世界上有猫也有老鼠， | 是不是？ | 在我们这—— |
| 那这一次没报名 | 是不是？ | 不是说心理不平-平衡不 |
| 人总有一个就是说，趋利避害嘛， | 是不是？ | 人，人总有一个 |
| 变异他有两种可能嘛， | 是不是？ | 他-他如果是，uh，就是说 |
| 病菌它主要是靠飞沫空气传染嘛， | 是不是？ | 天气太热了以后它这 |

Table 25.5 Top 50 three-word lexical chunks in the spoken data

| Rank | Frequency | Token | Rank | Frequency | Token |
|------|-----------|-------|------|-----------|-------|
| 1. | 464 | 不是不是 | 26. | 71 | 不是我 |
| 2. | 340 | 有一个 | 27. | 69 | 你不知道 |
| 3. | 192 | 的那个 | 28. | 68 | 也那个 |
| 4. | 187 | 的那个人 | 29. | 68 | 说的那种 |
| 5. | 179 | 了一个 | 30. | 67 | 是就说 |
| 6. | 175 | 了一个 | 31. | 64 | 我就说 |
| 7. | 142 | 的一个 | 32. | 63 | 挺好的 |
| 8. | 138 | 不是说 | 33. | 63 | 有好多 |
| 9. | 122 | 也不知道 | 34. | 63 | 的时候就 |
| 10. | 122 | 我不知道 | 35. | 61 | 我就不知道 |
| 11. | 101 | 那个什么 | 36. | 60 | 都然后就 |
| 12. | 96 | 不是是 | 37. | 60 | 然后我就 |
| 13. | 94 | 我就觉得 | 38. | 57 | 说的人 |
| 14. | 86 | 不是那个 | 39. | 56 | 很多不是 |
| 15. | 85 | 不是那个 | 40. | 56 | 说的人 |
| 16. | 85 | 不是那个 | 41. | 55 | 很多不是 |
| 17. | 82 | 我觉得我 | 42. | 55 | 说的人 |
| 18. | 82 | 我跟你说 | 43. | 55 | 另外不是 |
| 19. | 79 | 我跟你说 | 44. | 54 | 就进行了 |
| 20. | 79 | 对不对 | 45. | 54 | 对啊我 |
| 21. | 76 | 对我也 | 46. | 53 | 不是那 |
| 22. | 76 | 我也那 | 47. | 51 | 我说我 |
| 23. | 74 | 那个那 | 48. | 51 | 那个那 |
| 24. | 73 | 不是啊 | 49. | 51 | 那个那 |
| 25. | 71 | 一个什么 | 50. | 50 | 那个那 |

Most of these chunks are used by the speaker to address the coparticipant and sometimes also yield the floor of conversation.

Other interactive forms may make direct reference to the first and second persons, such as those in *wo gen ni* (我跟你)/ (*wo*) *gen ni jiang/shuo* ((我)跟你讲/说).

| | | | |
|----------------|------|-------------|--------|
| 他俩就是我跟你说 | 我跟你讲 | 就是那个什么吗 | 就是我大学那 |
| 保险公司就比较哇-对，其实 | 我跟你讲 | 我去第-份工作之前呢， | |
| 个菜馆儿，啊他俩就是 | 我跟你讲 | 我跟你讲就是那个什么吗 | |
| 因为这个吵过架，一个- | 我跟你讲 | 一个是-一个是- | |
| 脑子都大了，你可以估一下嘛， | 我跟你说 | 了嘛， | |

This kind of chunks can be seen as a metalinguistic device that helps regulating the flow of interaction by way of drawing the attention of the addressee to certain aspects of the talk (Tao 1996).

(2) Indefinite expressions involving *yi ge* (一个): *you yi ge* (有一个), *shi yi ge* (是一个), *yi ge ren* (一个人), and so on. Some of these expressions are for introducing a new referent into the discourse, functioning much like the indefinite article *a/an* in English. For example:

然后.. 嗯, 上面站 一个人。
 位子上, .. 后来还有 一个人。
 开-开始不久就有 一个人, eh, overdrunk-

Others are used in assessments, expressing the speaker's attitude toward the referent:

Wang Yu 是这么凶狠的 一个人。
 这个人是很危险的 一个人。
 有时候真的 一个人 -uh- 不能够 -太- handle

Still others can be deployed to express the speaker's uncertainty or low epistemic commitment, as in the combination of *yi ge* (一个) with *shenme* (什么):

然后中间回来过一次, 就是跟他老板有一个什么, 进一步合作, 然后我就看, 大概, ... 又有 一个什么问题要, 核实
 好像我大学的时候还去参加 一个什么 - 黄凯琴的歌迷会。..

In all of these cases the speaker is the one who provides information to the coparticipant—for example, the second line is from a conversation in which the speaker is recounting his experience with the police, which is first-hand experience—yet the information is framed in uncertain terms. This type of uncertainty can be regarded, among other things, as a way of downplaying the epistemic authority that the speaker may have over the coparticipant.

(3) Epistemic stance markers. These are lexico-grammatical units that indicate the speaker's degree of commitment to the information expressed in the utterances. Most of the epistemic stance markers in the multiword strings comprise of N+V clusters, where the N is typically a first-person pronoun and the V a cognitive verb (typically *zhidao* 知道 or *juede* 觉得). Common expressions on the list include *wo bu zhidao* (我不知道) / *wo jiu juede* (我就觉得) / *wo juede wo* (我觉得我) / *ye bu zhidao* (也不知道) / *dou bu zhidao* (都不知道).

What is interesting about these cognitive verbs such as *zhidao* 'to know' is that they are typically taken to indicate mental states, cognitive abilities, and so forth and take clausal units as complements. In Tao (2003), however, it is shown that half of the *zhidao* cases in the conversation corpus do not take any objects. Instead, as shown previously, they often form numerous types of combinations and function as special constructions with special meanings beyond the typical lexical semantics of the verb. Thus in addition

to the regular propositional meaning of indicating the speaker's lack of information, many of the multiword strings involving *zhidao* indicate a stance, showing a lack of commitment on the part of the speaker as to the source or truthfulness of the statement.

It is important to note that in all of the three word chunks, such as in *shi bu shi* (是不是) and *wo bu zhidao* (我不知道), each of the component words is among the high-frequency items and the combination as a whole is also common and independent. I call this the mechanism of collocation and colligation: words, especially high-frequency ones, whether they are function words or content words, combine with one another, forming the foundation of the basic vocabulary in the spoken language.

25.6 DISCUSSION AND CONCLUSIONS

In the preceding sections, I have discussed a number of properties of the spoken lexicon based on corpora, with ramifications for understanding the issue of lexical units. Overall, lexical distribution in spoken discourse exhibits highly skewed patterns, as predicted by Zipf's law. While most scholars accept the notion that disyllabification is the norm in Modern Chinese, corpus data show interesting patterns that deserve further examination. That is, at the lower level, we saw that monosyllabic words are active in many ways; their role is far more robust than previously recognized. Beyond the single word level, simultaneously, there are also word strings that function as unified chunks. These findings raise a number of issues for consideration.

First, we must answer the question of why a small number of active words can make up such a large portion of the core lexicon. I propose that the mechanisms are collocation and colligation: words combine with one another. Through combinations, new semiotic resources, on the basis of familiar materials, are created and serve to indicate subtle meanings in the conduct of social interaction. As a result, the frequencies of individual items in question also increase.

That words cluster is hardly a surprising finding. As corpus linguists have repeatedly shown, a proper understanding of language must evoke some degree of fixedness or idiomacity, which facilitates both speech production and comprehension. Researchers have reported that about 60% to 80% of spoken texts fall into some sort of formulaic sequences (Altenberg 1998; Erman and Warren 2000; Schmitt and Carter 2004). This study simply lends further support for formulaicity from Mandarin.

Finally, profiling the spoken lexicon can have important implications for various fields of applied linguistics. For example, one of the most commonly encountered issues in language acquisition is to improve native-like selection and native-like fluency (Pawley and Syder 1983; Wood 2002), whereby the focus is on using word combinations in ways close to how native speakers deploy them in actual communication. A key solution to this issue is to identify word frequencies (in conjunction with core vocabulary) and collocation patterns based on native speaker discourse. This is precisely the place where corpus-based studies can make important contributions.

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CHAPTER 26

MODELING WORD CONCEPTS WITHOUT CONVENTION

Linguistic and Computational Issues in Chinese Word Identification

CHU - REN HUANG AND NIANWEN XUE

26.1 INTRODUCTION: THEORETICAL ISSUES AND MOTIVATION

Words as a natural linguistic unit play an essential role in any theory of linguistics. Regardless of the design of framework, the ability of all speakers to recognize and share the same set of basic units is a prerequisite for any explanatory account. On one hand, a linguistic theory needs shared basic concept units to account for linguistic conceptualizations. On the other hand, a theory also needs shared units to account for how the arrangement of these units manipulates information for communication. The word is very often posited as the basic unit for both conceptualization and grammatical manipulation. Hence linguists and philosophers have been engaged in intensive discussion on how to define a word since the beginning of the 20th century; from Saussure's (1916) dichotomy of Signified and Signifier to Quine's (1960) semantic holism. However, in terms of an operational definition that can be tested, Bloomfield's (1926) "minimal free form" is still the norm. This view persisted among generative grammarians (e.g., Di Sciullo and Williams 1987) yet has not received much attention in the past twenty years. Most modern theories are constructed with the assumption that we know what a word is and can identify a word unfailingly.

That a word is an intuitive unit shared in many languages seems to be borne out in alphabetical writing systems. Most alphabetical writing systems incorporate a convention to mark the boundary of a word. A word boundary is typically marked with a blank space, such as in English. It is important to note that these conventionalized sociological words (as Chao 1968 terms them) do not always coincide with linguistic words. That 'the

White House' is a linguistic word but conventionalized to have three written and spoken segments is a well-known fact and has led to active research of so-called "multiword units" in computational linguistics. It is important to note that in languages with convention to mark word boundaries, such as English, the correlation between sociological words and linguistic words is very high. Hence sociological words delimited by blanks are often simply taken as linguistic units in computational linguistics. Tokenization, or word identification, is considered to be a marginal research issue in these languages.

Chinese orthography, however, does not conventionalize word boundaries. Instead, Chinese texts are composed of a string of characters, which are monosyllabic meaning bearing units. In other words, "sociological words" in Chinese correspond more closely to morphemes than words. In natural language processing, this fact makes word tokenization, better known as word segmentation in Chinese language processing, a prerequisite. The fact that segmentation remains a hot topic in Chinese language processing after some thirty years of intensive research clearly shows that it is not trivial to model human's ability to identify words. This difficulty also offers a rare and interesting case for us to examine the theoretical assumption that *word* is a universal concept in all languages.

Studies on word identification can also shed light on the role of modularity in language processing as the identification of words is the first step in a modular theory of grammatical processing. The concept of modularity (Fodor 1983) defines the debates among competing linguistic theories (Garfield 1991) and is often assumed in computational processing. However, with rare exceptions (e.g., McShane and Zacharski 2001), few studies have explicitly shown that modularity does improve performance in natural language processing. Since the integrity of modules is maintained and cross-modular operation is not allowed, modular approaches to language processing typically assume a sequential flow that allows basic information to be fed into later modules. Since the identification of a word as the basic linguistic unit logically occurs prior to all other grammatical operations, it needs to be carried out without prior linguistic knowledge. Hence it would be straightforward to test if the process of word identification is modular by simply showing that it does not involve any a priori linguistic knowledge. It is interesting to observe that currently most competitive approaches to Chinese word segmentation rely crucially on a large word list. Since lexical knowledge such as a word list is supposedly one of the direct outputs of segmentation, the technical issue of whether word segmentation can be achieved without a word list takes on the theoretical significance of whether this task can be performed successfully if strict modularity is followed.

26.2 PREMISE: OPERATIONAL DEFINITION OF WORD

Drastically different definitions of *word* can be elegant and self-sufficient within each linguistic framework; however, a set of different issues arise for an operational definition

of *word* with possible applications for automatic word identification. For instance, we need to know how to identify what is 'free' and what is 'minimal' if we adopt Bloomfield's definition of 'minimal free form'. In order to establish objective and empirical methodology, the intuitive method is to take conventionalized word breaks as a reliable approximation and then construct several heuristic rules, including lists of multiword expressions, to deal with exceptions. This approach has been shown to be efficient for language with highly conventionalized word breaks. However, this type of bootstrap approach cannot work for Chinese since there is no conventionalized word boundary marker in Chinese texts. Hence, Chinese offers a rare case for modeling word concepts straight from linguistic data.

26.2.1 Defining a Word as a Lexical Entry

The recent International Standard Organization (ISO) initiative to establish international standards for the lexicon, under ISO TC37/SC4, allowed a rare chance to compare and account for how words are defined in a wide range of languages. The discussion was carried out in the effort to build the Lexical Markup Framework (<http://www.lexicalmarkupframework.org/>, Francopoulo 2013), which can be applied to all languages. The framework has just been published as ISO-24613. The definition of a lexical atom determines the content of the lexicon. Given the wide typological variations of the world's languages, a definition of the lexical entry must be robust and versatile such that it can apply effectively and naturally to all languages.

Following consensus reached by the Lexical Markup Framework working group, we assume that the standard lexical entries are words of a particular language and that the set of words in a language is the result of optimal lemmatization. This is tantamount to saying that the set of lexical entries in any language is the optimal way to itemize basic units in the language. We further hypothesize that the optimization is obtained by the following definition:

Lexical entries are conceptual atoms which are also morphosyntactically autonomous.

In any language, there may be conceptual atoms that are not morphosyntactically autonomous and vice versa. Hence it is this simultaneous requirement that ensures that the lexical entries are the optimal way to itemize the grammatical knowledge of a language.

In consequence, lexical entries will include all the following linguistic units: words, stems, affixes, and clitics. Words are the traditional units adopted by lexicographers. However, words as lemmas may not be tenable in languages with rich morphophonology, such as the Austronesian languages. In these languages, a word is always composed of a stem and several affixes, and the phonological form of the word is dependent on the morphophonological rules involved. That is, a word has many conjugated forms, which can be predicted by the rule-governed combination of stems and affixes. In these languages, the optimal lemmas will consist of stems but not words. Similarly, affixes and clitics are conceptual atoms that have autonomous morphological slots (even though are often phonologically dependent on their hosts).

A consequence of such a view of lexical entries is that idiosyncrasies occur at the lexical level. Since lexical rules are applied to generate lexical entries, certain suppletive forms can be prelisted and considered as exceptions to the regular forms. This is in direct contrast to the rigid rules of syntax and phonology. Last, for languages whose writing systems do not conventionally demarcate words, it is essential that segmentation to identify words is performed as the first step of automatic processing of that language.

For Chinese, its simplicity of morphology and its highly conventionalized practice of treating the monomorphemic character as basic units mean that the challenge of identifying a word lies not at the morphophonology interface but at the morphosyntax interface. It is well known that words and compounds, especially what Sprout and Shi (1996) called root compounds, are very difficult to differentiate. This linguistic phenomenon is reflected by Chinese orthography and is discussed in the next section.

26.2.2 Orthography and Identification of Words

Orthographic convention plays an essential role in word identification in languages whose word boundary marks are orthographically conventionalized. However, for languages without orthographic marks to mark word breaks, the relation between word identification and orthography is unclear. On one hand, one may argue that orthography is secondary to (spoken) language and cannot determine basic linguistic concepts. On the other hand, one can argue that orthography conventionalizes shared lexical concepts and should contain direct evidence of how speakers agree as the basic units. In this sense, orthographic convention also conventionalizes lexical structure.

Sprout (2000) offered a comprehensive survey of how orthographic conventions can be utilized in natural language processing. He concentrated on phonological and morphological levels and introduced the term *orthographically relevant level* (ORL) to describe the different levels conventionalized by writing systems. The introduction of ORL helps to identify the linguistic significance of orthographic conventions. Sprout (2000) showed that the majority of writing systems in the world have morphophonological ORLs. By adopting his concept of ORL, and extending it beyond morphophonology, we are able to examine the ORLs of Mandarin Chinese and set the context for the linguistic significance of segmentation in Chinese.

Even though the Chinese writing system is often characterized as ideographic, it is also a well-established convention to decompose Chinese characters into semantic and phonetic parts. The phonetic parts link characters with phonological systems, given dialectal variations and historical changes. In other words, phonology is one of the ORLs for the Chinese writing system. It is interesting to note, in light of the relevance of phonology, that one of the recently popular adaptations in the Chinese writing system is to adopt the occidental writing system of English alphabets. Even though the experiment in China to replace character writing with alphabetic writing failed, Chinese people have naturally adopted alphabetic writing in a code-switching context at the lexical level. It is important to note that adaptation of alphabetic writing indicates both the source of

the loanword and the phonological pronunciation and that when a word is written in English alphabets, the English phonology, or at least some imitation of the English phonology, will be adopted. Examples of Chinese words that are conventionalized to adopt alphabetical writing are given in the following:

- (1) Words with alphabetical orthography
 - a. Simultaneous loan of word and orthography
IBM, ADSL, WTO
 - b. Loanword adopting orthography from a different source
LKK: To be old and senile, from Taiwanese *lau-ko-ko*
Q: to be of chewy texture that is pleasant to eat, from Taiwanese
- (2) Words with mixed orthography
 - a. 阿Q: a typical Chinese who is cynical and fatalistic, from a famous novel
 - b. K书: to hit the books (i.e. to study hard)
 - c. C 罍杯: C-cup (as in a bra)
 - d. A 钱: to attain money through ill-gotten means, that is, it is gained but not earned (probably loaned from Taiwan Southern Min)
 - e. 阿Sir: a police officer (borrowed from Hong Kong Cantonese, and probably a loan-blend with part of 'officer' truncated.)

A crucial fact involving these words is that there are no orthographic variations. For instance, the letter Q in both 阿Q and the adjective Q cannot be rendered by a Chinese character. It is also important to note that the syllable, roughly equivalent to the pronunciation of the English alphabet 'q' is not originally part of the Mandarin Chinese phonology and cannot be captured by any of the standard Romanization systems, including Pinyin and the national phonetic alphabet used in Taiwan (*Zhuyin Fuhao*). In other words, the idea that orthography is mapped to ORL in the phonology is applied robustly here and in fact extends the phonological inventory of the language in a non-productive way.

The fact that different Chinese scripts opt to use different orthographic forms to represent different phonological systems is remarkable for the long-standing theoretical assumption that each language prefers to maintain the integrity of its phonological system. Japanese is a good example, where its phonological system remains intact in spite of all the loanwords from different languages. In our view, this particular fact has to do more with the constraints of the Chinese writing system. Since the character-based orthography has lexical semantics as its ORL, it does not require and cannot guarantee phonological integrity. More specifically, it lacks explicit or implicit representation of the inventory of phonemes in Chinese. Since there is no "rendering" of loanword phonology to standard phonological representation, the loanword phonology is simply copied. On the other hand, since the borrowed pronunciation does not fit into the phonological

system represented by the existing orthography, a commonly taught orthography from a foreign language, based on the twenty-six letters of English, is also borrowed.

The difference in ORL can also be applied to underline the nature of the task of segmentation/tokenization in Chinese language processing. As phonology is an ORL for all alphabetic writing systems, space as a word boundary becomes essential since the phonological level does not indicate significant meaning representing units. In other words, a word break has the unique functional load to mark meaning units and has a form not inherent in alphabetic writing. For character-based writing systems, as each character is an integral unit that represents a basic concept, the function of marking basic meaning representing units is already partially fulfilled. In other words, a space as a word break introduces an additional ORL of lexical semantics to alphabetic writing, while it would be (partially) redundant in both form and meaning in a character writing system.

The fact that word boundaries are partially overlapping with the inherent boundaries of characters is a crucial fact in dealing with Chinese wordhood identification and word segmentation and is revisited later in this chapter.

26.3 MODELING CHINESE SEGMENTATION

Given the definition of a linguistic word and the role orthography plays in the identification of words, Chinese word segmentation poses challenges to both computational robustness and linguistic felicity. Up to now, most computational research on Chinese segmentation has concentrated on finding the algorithm to obtain the highest precision and recall, instead of addressing the issue of how to identify/define a word in Mandarin Chinese. In this section, we introduce different approaches as well as their theoretical motivations.

26.3.1 Main Challenges in Chinese Word Identification and Segmentation

Without conventionalized word boundaries, there are two main challenges to word identification or automatic word segmentation in Chinese. The first challenge is ambiguity. That is, a string of Chinese characters can be legitimately segmented into different words or word sequences depending on the context in which it appears, given a simplified scenario where the possibility of combination with characters outside of current string is not considered. For instance, the two-character string 个-人 is highly ambiguous in the Chinese TreeBank (Xue et al. 2005). It is treated as a single word in *gerenzi* 'individual' (3a) about 40% of the time (143/333), and as a two-word sequence in *gerenzi* 'classifier-person' (3b) about 60% of the time (190/333). A two-character string can be two-way ambiguous: it can function as either as a single two-character word or two single-character words. Longer strings have more complex ambiguity potentials. Given

the same simplified version of excluding combination with characters before and after the current string, a three-character string 'A-B-C', where A, B, and C are characters, are four-way ambiguous. It can either be segmented as a single three-word sequence 'ABC', or two two-word sequences of 'AB C' or 'A BC', or a three-word sequence 'A B C'. Although the degree of ambiguity has the potential of growing exponentially with the length of strings, fortunately it does not in reality. As mono- and bisyllabic (i.e., one- or two-character) words represent over 74% of word types and over 95% of word tokens in a typical corpus (Huang et al. 2002), longer words typically do not play significant role in word identification ambiguity.

- (3) a. 普金和卡斯德罗... 两人同时
 Pujin han kaside Luo liang ren tongshi ye
 Putin and Castro... two people same-time also
 建立了比较密切的个人关系。
 jianli qi le bijiao mique de geren guanxi
 establish IE relatively close DE personal relationship
 'Putin and Castro... the two of them at that time also established relatively close personal relationships.'

- b. 在中国, “家庭出身” 曾经足以决定一个人
 ren de minyin yun。 zai zhongguo jiating chushen cengjin zuyi jue ding yi ge
 ren DE mingyun
 in China, “family background” used-to be-sufficient determine one
 CL person DE destiny

'In China, “family background” used to be sufficient in determining a person's destiny.'

The second challenge is the so-called out-of-vocabulary (OOV) or “unknown” words (Chiang et al. 1992; Wu and Jiang 2000) problem. The unknown word problem arises because machine-readable dictionaries cannot exhaustively list all words in the language, and a mental lexicon cannot list all the words or cannot easily recall all of them. On one hand, language lexica are always in flux as neologisms add both new forms and meanings while old forms and meanings change or become obsolete. On the other hand, multiplication of domains and domain-specific usages also make it impractical to list all possible word forms and meanings in a general dictionary. Neologism, for instance, can involve compounding, in which new words are formed through the combination of existing words, or through *suoxie* ‘abbreviation’, in which components of existing words are extracted and combined to form new words. In addition, there is also no reliable way to predict or exhaustively list all the names of a named entity. Hence, the word identification task is faced with the challenge of not knowing for certain whether any not previously recognized string of characters should be a word or not.

The key to accurate word identification or automatic word segmentation in Chinese lies in the successful resolution of these ambiguities and an effective method of handling OOV words. The different approaches to Chinese word segmentation are to a large extent defined by how these two problems are approached.

26.3.2 Approaches to Chinese Word Segmentation

26.3.2.1 Pattern Matching Approach: Dictionary Lookup

The most intuitive computational approach in Chinese word segmentation is dictionary lookup. Note that computationally, word identification in Chinese is basically recognition of character string patterns, and the computer is very good at matching patterns. Almost all earlier proposals on Chinese segmentation include a dictionary lookup module (e.g., Chen and Liu 1992). Given a dictionary of words, one should be able to segment a Chinese sentence that consists of a string of characters into a sequence of words based on what is in the dictionary. Of course the dictionary lookup does not automatically resolve ambiguity, and other methods must be introduced. One of the early methods in resolving this ambiguity is called the *maximum matching algorithm*, which attempts to find the longest string of Chinese characters starting from a given point in a sentence that matches a word in the dictionary. The algorithm always prefers a two-character word over a one-character word. This tends out to be a very good bet in most cases. However, in case of strings like 个人 given in (3), where there is a more balanced distribution of the one-word and two-word scenarios, the maximum matching algorithm is less reliable.

A more serious challenge to the dictionary lookup approach is OOV. No lookup algorithm can compensate for gaps in lexical knowledge to identify nonlisted words. Hence the maximum matching algorithm often requires additional mechanisms, such as the use of statistical information to identify OOV words.

26.3.2.2 Statistical Approach: Strength of Internal Binding

Stochastic approaches were introduced when simple pattern matching proved to be inadequate for Chinese word segmentation. The first approaches employed identified the word as a unit by measuring the strength of binding between two characters. Any two-character strings that are strongly bound to each other are treated as a word. This is not unlike the linguistic approach of characterizing a two-character sequence as bound, or free, for each character (Chao 1968). Mutual information (MI) was one of the first statistic measures introduced to deal with this problem (Sprout and Shi 1990; Huang 1995; Sprout et al. 1996). These MI-based studies also address the issue of whether the concept of a linguistic word can be quantitatively defined, an issue not addressed in later research on segmentation. Sprout and Shi (1990), for instance, attempted to identify all words from a corpus without referring to a dictionary. Given a string of characters $C_1 \dots C_n$, they assume that the pairs of adjacent characters with a MI value greater than a threshold are likely candidates to be words. This elegant statistical approach without the use of a dictionary as a general solution to Chinese word identification yields

reasonable recall and accuracy of bisyllabic words but requires a more complicated and less elegant approach to longer words. In addition, there is no reliable a priori way to set the threshold for word identification, and there is no nonarbitrary solution to rule out highly collaborative nonword bigrams. For instance, the two-word sequences *jiu4 jiang1* 就*将 'just about (to)' or *cai2 bu4* 才不 'rather not' will be assigned some of the highest MI values from a corpus but are not words. In addition, since MI is used to measure the strength of bonds between two characters, it has no direct solution to inherent ambiguities where a two-character string can be either a word or two words, like the 个-人 'individual' / 'classifier-person' example given previously.

26.3.2.3 Tagging Character Positions and Machine Learning

Another way to look at the word identification problem in terms of characters is that a character can occupy different positions in a word. It can be word-initial, word-internal, or word-final. Instead of finding out where the word boundaries are, we can simply look at the characters and find out their most likely positions in a word. By learning where the word-initial and word-final characters are, we in effect find the word boundaries. In contrast to the MI-based approach, the character position and labeling approach allows a character to be given a different value in different contexts. In the original formulation of this approach, Xue (2003) used a set of four tags in representing the position of a character within a word: LR (the character is a word by itself), LL (the character starts a word but it is not a word by itself), MM (the character is in the middle of a word), and RR (the character is on the right edge of a word but is not a word by itself). Given this formulation, the character 产 would receive different position labels based on the position in which it occurs in a word:

| | |
|---------------------|-----------------------------------|
| LL (left) | 产生 chansheng 'to come up with' |
| LR (word by itself) | 产小麦 chan xiaomai 'to grow wheat' |
| MM (middle) | 生产线 shengchanxian 'assembly line' |
| RR (right) | 生产 shengchan 'to produce' |

Ambiguity arises when a character can potentially occur in multiple positions. In the previous example, 产 can occur in all four positions. However, in a specific context, it can occur only in one position and thus receive one tag. The character tagging approach proves to be a very simple and yet powerful approach when combined with machine learning approaches that can effectively use contextual information for disambiguation to make tagging decisions.

There are several advantages of formulating Chinese word boundary discovery as a character position problem, especially in the context where machine learning algorithms can be applied. First, the number of possible positions for a character in a word is small. Generally speaking machine learning algorithms deal with small tagset problems more effectively than large tagset problems. Second, a substantial number of characters are distributed in a constrained manner and can provide context for resolving the

position tag for more ambiguous characters. For example, 们, the plural marker, almost always occurs in the word final position. Finally, the character tagging approach offers a principled way of handling OOV words. The boundary of OOV words are determined exactly the same way as in-vocabulary words, by the position tag of the characters in that word. For instance, *mana* 吗哪 'manna' is likely to be an OOV word according to many dictionaries. This OOV word can be correctly segmented regardless of the predominance of the question particle 吗 as a word by itself (tag LR) in corpus as the corpus should also have word-initial (tag LL) context and data based on words such as *mazfei* 吗啡 'morphine'.

Because of its simplicity and the high accuracies it produces when an appropriate machine learning algorithm is adopted, the character tagging approach is prevalent in recent works on Chinese word segmentation and especially in the last several International Word Segmentation Bakeoffs (Emerson 2005; Levow 2006; Jin and Chen 2008).

26.3.2.4 Word Boundary Decision

A recent proposal of Chinese word segmentation is to return to the basic issue of Word Boundary Decision (WBD; Huang et al. 2007; Huang et al. 2008). It is easy to observe from the evolution of segmentation algorithms that new models tend to reduce the complexity of the segmentation problem to achieve better results. Dictionary lookup involves identification of tens of thousands of lexical units with varying lengths. Character tagging involves two to six class classifications of roughly 6,000 characters. WBD proposes to reduce the task to a binary and unary decision on one unit. The crucial innovation is that segmentation need not involve classification of words or characters; it only involves classification of the intervals in between two characters. If the decision is modeled to decide on whether an interval is a word boundary or a character boundary, it is a binary decision problem. However, since all character boundaries already exist in a text, and all word boundaries are also necessary character boundaries, it can also be modeled as a unary decision of whether to turn an existing character boundary to a word boundary.

Huang et al. (2007) proposes that Chinese text can be formalized as a sequence of characters and intervals as illustrated in Figure 26.1.

$$C_1, I_1, C_2, I_2, \dots, C_{n-1}, C_n$$

In a segmented text, all the intervals between characters are labeled as a word boundary or as a character boundary. Each boundary item B is flanked by character strings as its contexts. It is crucial to note that whether these character strings form words or not is irrelevant in the WBD model, as the character strings are simply contextual features contributing to the decision on whether an interval is a word boundary or not. Also note that such a model meets the strict modularity constraint that word segmentation does not access lexical information.

$$c_1, A_1, c_2, I_2, \dots, c_{n-1}, I_{n-1}, c_n$$

FIGURE 26.1 Chinese Text Formalization

The WBD approach to Chinese word segmentation replies to two challenges in word segmentation. First, by breaking away from established methods and not referring to any word list, it shows that strict modularity can be maintained and yield promising results in the basic language processing task of word identification. Second, by being as effective with OOV words and by being able to segment texts with a reasonably short processing time, it suggests that robust word segmentation for real application in Chinese is within reach, especially in the context of adaptation of new domains without large annotated training datasets.

26.4 EVALUATION

The fact that the modeling of *word* in Chinese attracted both theoretical and computational studies poses an interesting issue in terms of the research paradigm of evaluation. Evaluation in computational linguistics is primarily quantitative, and evaluation in theoretical linguistics is essentially qualitative.

26.4.1 Evaluation in Computational Linguistics

In computational linguistics, word segmentation accuracy is generally evaluated in terms of precision, recall, and a balanced f-score. Precision is the number of words that are segmented correctly divided by the total number of words that a word segmentation system identifies as words in a corpus. Recall is the total number of correctly segmented words divided by the total number of words in the gold standard corpus that the word segmentation system is compared against. To count as highly accurate, the system has to produce word segmentation with both high precision and high recall. These two scores are often combined into one quantified measure, the f-score, based on the formula below:

$$f = \left[\frac{2 \times \text{precision} \times \text{recall}}{\text{precision} + \text{recall}} \right]$$

Robustness is also an important criterion for high quality word segmentation that currently receives relatively little attention. Note that the above f-score quantitative measure relies on the availability of a standard set of answers (called the gold standard in computational linguistics). However, such gold standards are only available with

frequently used familiar types of data. In addition, given a set of standard answers and a goal to achieve a higher score, it is likely that overfitting will occur. That is, some methods may be developed to achieve possible scores for a particular test at the cost of lowering its performance for other possible datasets. Word segmentation accuracy often does not carry across genres without retraining. Current state-of-the-art systems have reached very high accuracy when evaluated against manually annotated gold standard corpora. For example, in the SIGHAN International Word Segmentation Bakeoffs, 95% or higher accuracy is routinely reported for high-performing systems. But when used in realistic applications such as machine translation, there is anecdotal evidence that current word segmentation systems are still inadequate, especially when the test data is very different from the data on which the word segmentation systems are trained. This is one area where there is still no effective evaluation tools to help Chinese segmentation improve.

26.4.2 Linguistic Evaluation

There are two possible ways to evaluate Chinese segmentation algorithms by linguistic principles. The first is to test if the results match the concept of wordhood. The second is to test if the algorithm reflects a realistic model of how humans recognize words. However, the literature and previous discussion showed that, although the definition of word is widely accepted, linguistic judgment is often controversial. Hence a test based on the definition of word seems unlikely to yield a robust evaluation.

The fact that word boundaries are not conventionalized in Chinese orthography presents computational Chinese word segmentation as a possible way to computationally model how words are identified linguistically. It is interesting to note that the two most promising approaches are the ones that involve the least amount of lexical knowledge. For the character tagging approach, no explicit knowledge of words or word lists are referred to. It refers to the knowledge of words indirectly by marking the position of each character in a word. The WBD approach requires no knowledge of a word list at all. The fact that these two approaches achieve the most promising results so far supports the modular view of language processing. That is, word identification is the most preliminary task of language processing and also is the prerequisite of lexicon construction and thus should not refer to knowledge of the lexicon.

Both the character tagging approach and the WBD approach can also be viewed as implicitly modeling morphological information. Although Chinese does not have very productive derivational morphology, it does have many productive prefixes and suffixes, such as *du4* 度 ‘-ity’ as suffix and *ai* 阿 ‘prefix for informal names’. In addition, compounding is productive in Chinese, and the most productive compound roots do tend to occur in either word-initial or word-final positions. In other words, word boundaries correlate highly with these edge items.

26.5 CONCLUSION: STATE-OF-THE-ART AND FUTURE DEVELOPMENTS

We have discussed the issues involved in linguistic word identification and computational word segmentation based on Chinese data in this article. Our survey shows that a modular processing model can be supported and that word identification and segmentation may not be as complicated a problem as it may have seemed originally since words may have strong clustering features that make them easy to be detected in a text. Recent developments in automatic Chinese word segmentation suggest that linguistically felicitous modeling can lead to robust computational implementation and that computational and theoretical approaches can converge to lead to a better definition of word in Chinese both qualitatively and quantitatively.

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CHAPTER 27

THE USES OF DE 的 AS
A NOUN PHRASE MARKER

CHAOFEN SUN

27.1 INTRODUCTION

AMONG all the Chinese characters, 的, standing for a nominal marker *de*, with a 4% occurrence rate at the text-count level (Institute of Language Education 1986), has been demonstrated to be the most frequently used character in Modern Standard Chinese. Its grammatical functions have also long been a subject of investigation in Chinese linguistics. Li and Thompson (1981) observe that the toneless *de* can mostly function as a nominalizer (1a), an attributive marker (1b), and a genitive marker (1c) in front of its head noun.

- (1) a. *you qian-de*
have money NOM
'those who have money/the rich'
- b. *hao de shu* *hao shu*
good ATT.Book good book
'good book(s)' 'good book(s)'
- c. *wo de baba* *wo baba*
1st GEN father 1st father
'my father' 'my father'

Other than its use as a nominalizer, the other two uses, attributive and genitive, in (1) appear to be optional. In contrast, the example in (2) suggests that the attributive use of *de* in some cases is not allowed.

- (2) *gaoren* **gao de ren*
tall person tall ATT. person
'a great man'

Zhang (1998) claims that the use, or non-use, of *de* is associated with some cognitive factors such as the distance between two concepts, the existence of a corresponding proper noun (3), mutual possession (1c), and so on. Nevertheless, it is unclear how to measure the distance between an adjective "good" and the noun "book," as good books, as well as bad books, do commonly exist. Furthermore, although the status of proper nouns does deserve more attention, it still falls short of explicating the use of *de* (implying *school(s)*), and the non-use (implying *school* only), in (3).

- (3) *women (de) xuexiao*¹
1st-PL GEN school
'our school(s)'

Some treat *de*'s uses purely in terms of syntax. For example, in (4) its use is attributed (Huang 2008) to a process of gerundive formation. That is, in the deep structure there is a serial verb construction with two identical verbs *dang*, and *de* is inserted resulting from the gerundive formation. However, no explanation of the use, or non-use, of *de* in (1-3) would follow, not to say that three grammatical sentences in (4) leave the insertion of *de* unmotivated.

- (4) a. *ta dang laoshi dang de hao* (deep structure)
3rd do teacher do potential good
'His teaching executes well.'
- b. *ta laoshi dang de hao* (delete the first verb *dang*)
3rd teacher do POT good
'His teaching executes well.'
- c. *ta de laoshi dang de hao* (insert *de*)
3rd GEN teacher do POT good
'His teaching executes well.'

Still some others (Chao 1976; Duanmu 1990) strive to solve the problems largely in terms of phonology and syntax. Feng (2001) claims that between words and phrases there are prosodic and syntactic words. For example, *dianshi* (electric-see) 'TV' and *dizhen* (ground-shake) 'earthquake' are simple words in the most traditional sense, and *haokan de dianying* (good-see ATT electric-shadow) 'good movies' are noun phrases with a modifier *de*. There are complex formations in Chinese with two or three syllables that naturally form complex prosodic words. For example, the two morphemes in *paobu* in (5a) can be separated to form a verb phrase *pao-de bu* in (5b). Whereas the two

morphemes in simple words like *dianshi* (electric-see) 'TV', and *dizhen* (ground-shake) 'earthquake' are inseparable and totally lexicalized into one word, there are complex words like *paobu* in (5a) with a separable internal structure in Chinese. Although *paobu* is used as a noun functioning as the object of the transitive verb *xihuan*, it is separable by a verb suffix *-le* in (5b). So *paobu* in (5a) is a complex prosodic word.

(5) a. *wo xihuan paobu*

1st like run

'I like jogging'

b. *pao-le bu*

run-ASP step

'have run'

It then follows to say that the nominal *gaoren* 'a great man' in (2) is a simple word, and, therefore, it does not allow a grammatical marker *de*. Furthermore, although *hao de shu* in (1) is a noun phrase, *hao shu* forms a prosodic word, justifying the omission of *de*. This then appears to have solved the problem.

However, this solution still does not explain cases when the use, or non-use, of *de* actually differs systematically in meaning. Note that the example in (3) *women de xuexiao* (1st-PL GEN school) 'our school(s)' are ambiguous. Without *de* the people represented by the pronoun *women* 'we' are necessarily from the same school. However, with *de*, *women* can be from either a common school or different schools. There also can be a semantic difference between *wo de baba* and *wo baba* in (1c), even though both mean 'my father' and can be used interchangeably in many situations. However, it is either ungrammatical or highly infelicitous for a child to use the term with *de* to address or refer to his or her father among immediate family members. The reason is that in this situation the father figure is unique.

A search of the modern Chinese corpus at the Research Center of Chinese Linguistics at Peking University shows some interesting results too. In brief, the non-use of *de* is much more numerous than the use. Furthermore, both can appear in either informal dialogues or more formal contexts.

(6) Chinese Expressions for 'my father/dad'

wo fuqin 1935 *wo de fuqin* 864 'my father'*wo baba* 646 *wo de baba* 107 'my dad'

The most significant finding, as far as the use of *de* is concerned, is its uses in the book, article, or film titles in (7), where authors almost exceptionally use *de*. Obviously, the intended audience of a book/film title is not for immediate family members. To a general audience, the father figure of an author is far from being unique at first mention. It is simply an individual member of the set of people who are fathers.

- (7) *wo de fuqin he muqin* 'My Father and Mother'
wo de fuqin Zhu De 'My Father Zhu De'
wo de fuqin Deng Xiaoping 'My Father Deng Xiaoping'
wo de fuqin Dong Biwu 'My Father Dong Biwu'
wo de baba hui buxie 'My Father Can Repair Shoes'
huiyi wo de fuqin 'In Memory of My Father'
Zhou zongli ji wo de fuqin Zhou Rongxin
 'Premier Zhou and My Father Zhou Rongxin'

In Modern Standard Chinese the grammatical occurrences of *de* is not allowed to occur in a lexicalized noun that stands for a kind (of things), or concept. Section 27.2 demonstrates how the use of the grammatical marker *de* interacts with semantic notions such as uniqueness, kinds, and concepts, as well as the lexical and grammatical statuses in various Chinese expressions. Section 27.3 discusses the collocations of different expressions involving *de*. Section 27.4 concludes the chapter with a lexical/grammatical continuum of the nominal system in relation to the grammatical/phrasal marker *de* in Chinese.

27.2 UNIQUENESS, KIND OF THINGS, AND COMMON CONCEPTS

As shown previously, *de* as a phrasal marker functions to signal modification of an individual entity. In book titles authors, for example, use it to introduce (or foreground) a hero, for example, a father out of all the fathers. On the other hand, the non-use of *de* is associated with uniqueness. Uniqueness is normally understood as one and only one individual who fits the definite's descriptive content (Russell 1905) in presupposition (Strawson 1950). The referents of proper nouns are semantically unique. In Modern Standard Chinese no nominal marker *de* is allowed for proper nouns, in spite of the fact that similar coding devices in other languages are not subject to the same restriction. In (8), for instance, the English *of* or *'s*, are grammatically used in proper nouns. But in Chinese, the corresponding *de* is not allowed to do so.

- (8) a. 'Bank of China' *zhongguo yinhang* China bank
 'Chinese banks' *zhongguo de yinhang* China ATT bank
 b. 'Devil's Slide' *guipo* devil slope
 **gui de po*
 c. 'Sea Lion's Cave' *haishidong* sea lion cave
 'a sea lion's cave' *haishi de dong* sea lion ATT cave

This same restriction applies to the official names of multiple words (9).

- (9) a. *guojia yuyan wenzi gongzuo weiyuanhui*
state language writing work committee
'State Language Planning Committee'
b. *guojia yuyan wenzi de gongzuo weiyuanhui*
state language writing ATT work committee
'a state committee on language planning'

Other than proper nouns with unique referents, conventionalized common nouns indicating a kind of things, or an individual concept, in Modern Standard Chinese do not allow the phrasal marker *de* to occur inside them (Carlson 1977; Li and Thompson 1981) as in (10).

- (10) *dianyingyuan tushuguan sixiang*
electric-shadow house picture-book house think think
'movies theater' 'library' 'thought'
**dianying de yuan* **tushu de guan* **si de xiang*

It then follows to say that when multiple morphemes/syllables are lexicalized to form a noun, the grammatical marker *de* is not allowed because *de*, signaling modification, simultaneously codifies a phrasal structure with a head noun and its modifier. As was noted previously, in situations when there is a unique reading for *wo baba* 'my father' and *women xuexiao* 'our school' the phrasal form with *de* is not allowed. That is, a word representing a unique entity, a kind of things, or a concept is not a phrase but a lexicalized word. In sum, in a sequence of morphemes, N+N, the one without *de* signifies a lexicalized compound word with semantically unique or kind reference, as *wo baba* 'my father' is a word-like format. On the other hand, a phrasal format refers to an individual or a subset of a kind/set.

The data in (11) make obvious how the notions of uniqueness and kind covary with different situations with the use of the Chinese *de*. In (11a) *zhongguo* is used like an adjective meaning 'Chinese'. As a national flag, *zhongguo guoqi* is unique and appears in a form without *de*. Moreover, it does not make sense to be modified by a degree adverb *hen* in (11b) in a context where the referent is unique. However, in a context involving multiple national flags representing different countries, *zhongguo de guoqi* is then an individual member of the set of the national flags representing different countries and thus is grammatical without the unique reading. Furthermore, if we change the head noun into a common noun (i.e., a flag), a phrasal expression is good as *qizi* here definitely refers to a flag, or a subset of flags, that simply look very Chinese.

- (11) a. *zhongguo guoqi* *zhongguo de guoqi*
Chinese national flag Chinese ATT national flag
'Chinese national flag' 'a national flag of China'

- b. **hen zhongguo de guoqi* *hen zhongguo de qizi*
very Chinese ATT national very Chinese ATT flag
flag 'a very Chinese flag'

The examples in (12) show the use, or non-use, of the phrasal marker *de* with respect to an adjective-noun sequence (thus and AN format) demonstrate similar properties. The form/meaning pairs here further support the division of phrase-like and word-like treatment of various combinations of morphemes. On the one hand, *bai* in *baizhi* is ambiguous between 'white' and 'blank'. On the other hand, in the two instances with a phrasal structure, only the 'white' reading is possible. It is therefore hypothesized that the sequence *baizhi*, when used to mean 'blank', is a lexicalized word-like form, signifying a kind of paper that includes blank papers of various colors. The reading maintaining the 'white' meaning symbolizes another category of *bai-zhi* 'white paper' similar to the phrasal *bai de zhi*. So this type can be treated as a phrase-like word.

- (12) *baizhi* *bai de zhi* *hen bai de zhi*
white paper white ATT paper very white ATT paper
'white paper or blank paper' 'white paper' 'very white paper'

Pertaining to the word/phrase dichotomy, the data in (13) resemble *bai zhi/bai de zhi* in (12) but differ in that the word form *hao zhaotou* is not ambiguous and does not have a word-like form.

- (13) *hao-zhaotou hao de zhaotou hen hao de zhaotou*
good omen good ATT omen very good ATT omen
'good omen' 'a good omen' 'a very good omen'

Note that different from the adjective *hao* in (13), the same morpheme *hao* in (14) is part of a sequence that behaves like a word, a category represented by the *baizhi* meaning 'blank paper'. That is, *haopengyou* and *pengyou* must be treated as two different lexical items loosely representing two kinds of friends, 'good friends' and 'friends'. Whereas *pengyou* is a regular word, the ungrammatical **hao de pengyou* confirms that *haopengyou* is a word-like word resembling *baizhi* with the blank reading.

- (14) *haopengyou hao de pengyou?* **hen hao-pengyou* **hen hao zhaotou*
good friend good ATT friend very good friend very good omen
'good friends'

The distributions in (12) through (15) also demonstrate that although the word-like or phrase-like words can co-occur with the degree modifier *hen* 'very' in a phrasal form,

words like *pengyou* and *zhi* cannot **hen peng de you*, or **hen zhi* in Modern Standard Chinese.

- (15) *hen hao de pengyou*
 very good ATT. friend
 'a very good friend/very good friends'

The data in (16) is a summary of three kinds of nouns: word, word-like, and phrase-like, with various degrees of lexicalization.

| (16) word | word-like | phrase-like | phrase |
|----------------|--------------------|-----------------------|-------------------------|
| <i>zhi</i> | - | - | - |
| 'paper' | <i>baizhi</i> | <i>bai-zhi</i> | <i>bai de zhi</i> |
| - | 'blank paper' | 'white paper' | 'white paper' |
| <i>pengyou</i> | - | - | * <i>peng de you</i> |
| 'friend' | <i>haopengyou</i> | - | * <i>hao de pengyou</i> |
| - | 'good friend' | - | - |
| <i>zhaotou</i> | - | - | - |
| 'omen' | <i>hao-zhaotou</i> | <i>hao de zhaotou</i> | - |
| - | 'a good omen' | 'a good omen' | - |

27.3 COLLOCATIONS (SELECTIONAL RESTRICTIONS)

Unlike English in which each word is separated by an empty space in writing, each Chinese syllable is represented by a character that can be a bound morpheme like an aspect marker *-le* 了 or a free morpheme like a noun *shan* 山 'hill'. That is, a word can be of one character/syllable, two, three, or more, and there is no requirement to leave space between characters. As a result, the notion of word may not be a most intuitive notion to most native Chinese speakers. Consequently, the boundary of a word in general is not very clear, as a word can be made of any number of syllables. Moreover, the use, or non-use, of *de* which is a marker of nominal modification to a large extent depends on the lexical status of an expression. It is therefore difficult to determine the lexical status

of a Chinese expression because of the elusive nature of a Chinese word. For example, the three-character word-like *haopengyou* 好朋友 and the two-character word *pengyou* 朋友 do not allow *de* to occur inside them. But for the word-like noun, the internal adjectival morpheme *hao* can be modified by a degree adverb *hen* 'very' in a phrasal format (see 15), even though it does not allow the phrasal **hao de pengyou* in (16). Still another kind is the phrase-like noun that allows a simple phrasal structure such as *bai de zhi* or *hen bai de zhi* 'white paper', representing an even more loosely formed compound. Furthermore, the prohibition on the use of *de* in a simple noun, or a proper noun, distinguishes a word-like noun, or phrase-like, noun from a totally lexicalized item.

This section copes with the notion of collocation as the use, or non-use, of *de* is much messier than what has been covered so far. Collocation generally refers to expressions that are not highly frequent but constitute idiomatic chunks while still maintaining strong connections to component words, such as *bright daylight* or *several times* in English (Bybee 2011). In addition to the data discussed so far, there are many expressions involving *de* in Chinese showing exactly the same kind of properties. The data in (17) reveals that the uses of *bie* to form a word with another component are in a totally unpredictable manner, as *bieren* 'other people' is good and **bieshi* is not. Both words are disyllabic with the same internal structure, N+N, or other+noun. It is therefore clear that the uses of *de* unfortunately can not be explained in terms of some simple phonological or syntactic rules.

| | |
|-----------------------|-------------------|
| (17) a. <i>bieren</i> | <i>bie de ren</i> |
| other people | other ATT people |
| 'others' | 'others' |
| b. * <i>bieshi</i> | <i>bie de shi</i> |
| other matter | other ATT matter |
| 'other matters' | 'other matters' |

To further illustrate this idiosyncrasy, the examples in (18)³ with a similar structure like those in (17), the use or non-use of *de* between *qita*, a noun meaning 'other', and another noun are nevertheless totally free, in spite of the fact that the meanings of the component parts are nearly identical with those in (17).

| | | | |
|----------------------|--------------------|--------------------|-----------------------|
| (18) <i>qita ren</i> | <i>qita dongxi</i> | <i>qita de ren</i> | <i>qita de dongxi</i> |
| other people | other thing | other ATT people | other ATT thing |
| 'other people' | 'other things' | 'other people' | 'other thing' |

So it is entirely possible that each item here is lexically determined. That is, native speakers can arbitrarily choose either a word, or a phrasal, treatment to an expression. The data in (19) are additional data showing the arbitrariness of the use of *de* regardless of the syllable structure.

- (19) *pangbian* **pang de bian*
 side side side ATT side
 'on the side'
 **pang xingqu* *pang de xingqu*
 side interest side ATT interest
 'other interest'

The data in (20) with some popular four-syllable idioms further exemplifies this arbitrariness regardless of its identical structure in form and meaning. Therefore, the uses of *de* in many cases are determined by collocation, the arbitrariness of each expression.

- (20) a. *baise kongbu* **baise de kongbu* (non-use of *de*)
 white color terror white color ATT terror
 'terrorism'
 b. *jinxu heshan* **jinxu de heshan* (non-use of *de*)
 silk pretty river hill silk pretty ATT river hill
 'a beautiful country'
 c. *hongse jiangshan* *hongse de jiangshan* (optional)
 red color river hill red color ATT river hill
 'the revolutionary country'
 'the revolutionary country'
 d. *dahao heshan* *dahao de heshan*
 big good river hill big good ATT river hill
 'the beautiful country'
 'the beautiful country'

The collocation may be indicative of the degree of lexicalization, a process that is typically gradual with unpredictable patterns in use. Some of them may even be cases of lexical diffusion as was observed by Wang (1979). Brinton and Traugott (2005:96–97) observes:

Lexicalization is the change whereby in certain linguistic contexts speakers use a syntactic construction or word formation as a new contentful form with formal and semantic properties that are not completely derivable or predictable from the constituents of the construction or the word formation pattern. Over time there may be further loss of internal constituency and the item may become more lexical.

Trousdale (2008) observes that the lexicalization of the English compound word *driver license* is a move to nonreferential modifying noun by associate loss of possessive marker reflecting an increase of conventionalization of an expression. In this light, the various examples noted in (12) can be characterized in a like manner, even though Chinese in

general is a language without articles. At the beginning process, as a phrase, *zhi* is used as a noun signaling a kind of thing (paper) with an adjectival modifier *bai*. The lexicalization of the expression meaning 'white paper' into a phrase-like word without *de* may have been responsible for the rise of the word-like word, meaning 'blank paper,' without white color implication.

- (21) [the driver's] license > [a driver]'s license > a [driver's license] > a [driver license]
 [bai de] zhi > [bai (de)] zhi > [bai] zhi > [baizhi]
 white ATT paper white ATT paper white paper white paper
 'white paper' 'white paper' 'white paper' 'blank paper'

It has long been observed that multisyllable expressions in Chinese may be analyzed either as a word or a phrase. For example, in (22a) there is a nine-syllable word referring to a special type of accelerator in a physics lab. Lü (1979) found that the long sequence probably should be treated as a word, although he believed that in theory it can be a phrase too.

- (22) a. *tongbu wenxiang huixuan jiasugi* (同步稳相回旋加速器)
 synchronize steady cycle accelerator
 'synchronized steady cyclotron'
 b. *tongbu de wenxiang huixuan jiasugi*
 synchronize ATT steady cycle accelerator

This kind of intuition is what the section tries to capture, that is, there are many Chinese words native speakers do not know if they are really a word or a phrase, thus allowing two kinds of treatment (16, 17, 19, 20). On the one hand, to a knowledgeable physicist, a phrasal treatment with *de* in (22b) may sound bad as it represents a kind of equipment. On the other hand, a naïve native speaker may still arbitrarily treat it as a phrase for the lack of a good understanding of the machine it represents.

27.4 A CONTINUUM FROM LEXICAL NOUNS TO GRAMMATICAL PHRASES

To conclude, Chinese noun phrases can be placed on a continuum in (23) between lexical and grammatical (phrasal) ends in accord to the covariations of their meaning (uniqueness/kind) and form (co-occurrences with *de* and the degree modifier *hen* 'very').

- (23) The nominal system of Modern Stanford Chinese
Lexical (no use of *de*)

| | |
|---|---|
| a. proper nouns | (unique, no degree modifier for adjectives) |
| b. common nouns | (conventionalized nouns; kinds and concepts; no degree modifier for adjectives) |
| c. word-like nouns | (collocation, no <i>de</i> after some modifiers) |
| d. phrase-like nouns | (collocation, with, or without <i>de</i> ; after some modifier) |
| e. modifying clauses | (individual member, or a subset, of a kind, phrasal) |
| f. nominalizations | (unspecified individual member, or a subset, kind) |
| Grammatical (necessary use of <i>de</i>) | |

It was noted previously that Chinese proper nouns with unique references (cf. *zhong-guo yinhang* 'Bank of China', *guipo* 'Devil's Slide', *guojia yuyan wenzi gongzuo weiyuanhui* 'State Language Planning Committee', 8a, 8b, 9) and common nouns signaling kinds and concepts do not allow the phrasal marker to occur inside a word (cf. *gaoren* 'great person', *dianyingyuan* 'movies theater', *tushuguan* 'library', *sixiang* 'thought', 2 and 10). However, even though a lexical noun in Chinese typically does not allow a phrasal marker *de* inside the word, or for it to be modified by a degree adverb *hen* (24b), a lexicalized word-like, or phrase-like, noun with transparent morphemes can still be reanalyzed as a phrase and be modified by *hen*. Therefore, there is no clear-cut morphology to mark the boundary between a word and a phrase in Chinese.

- (24) a. *hen hao*
very good
'very good'
b. **hen haopengyou*
very good friend
c. *hen hao de pengyou*
very good ATT. friend
'very good friends'

Due to this illusive nature of the Chinese morphology and its writing script without any formal recognition of the status of a word, in the middle of the continuum in (23) are two categories, word-like and phrase-like between a regular noun and a nominal phrase. The word-like category includes words such as *haopengyou* 'good friends' that do not allow simple phrasal modification **hao de pengyou* but tolerate a phrasal structure with a degree modifier *hen* 'very' in *hen hao de pengyou* 'very good friends'. The phrase-like category consists of those, such as *hao-zhaotou* 'good omens', that allow *hao-zhaotou*

and *hao de zhaotou* 'good omens', plus *hen hao de zhaotou* 'very good omens'. Another set of examples for the phrase-like category can be *piaoliang-xiaojie* as in (25).

- (25) *piaoliang-xiaojie* *piaoliang de xiaojie* *hen piaoliang de xiaojie*
pretty girl pretty ATT. girl very pretty ATT. girl
'pretty girls' 'pretty girls' 'very pretty girls'

In contrast, the initial adjective-like element in a word-like form does not modify with a phrasal marker *de*, such as *gaoren* 'great person', **gao de ren*. Neither can it be modified by a degree adverb, **hen gaoren*. Frequently, what determines a specific pattern for a given expression can be collocation constraints, which can be totally arbitrary.

Other noun phrases in the word-like category are N+N compound words like *wo baba* 'my dad' in (6), or *women xuexiao* 'our school' in (3), which have a unique reading. They correspond to phrasal expressions like *wo de baba* 'my dad' or *women de xuexiao* 'our schools', which imply an individual member or a subset of a kind.

At the other end of the continuum are the two grammatical categories including noun phrases like nominalization and a head noun with a modifier, which, in turn, can be a noun *zuotian* in (26a), a clause in which both arguments of the verb *mai* 'sell' are omitted (26b), and a clause in which one of the arguments is omitted (26c).

- (26) a. *zuotian de shucai*
yesterday ATT. vegetable
'yesterday's vegetable'
b. *zuotian mai de shucai*
yesterday sell ATT. vegetable
'the vegetable sold yesterday'
c. *zuotian mai shucai de ren*
yesterday sell vegetable ATT. person
'the person who sold vegetable yesterday'

In (26a) and (26b), the head noun *shucai* is a word representing a subset of *shucai* 'vegetable' defined by the modifiers, such as *yesterday* or *sold yesterday*. It is in this sense that the grammatical marker *de* is treated as having a dual function: structurally signaling a phrasal modifier and pragmatically further clarifying the nature or property of an individual/subset. The phrasal marker *de* is then obligatory in nature.

The data in (27) demonstrate how the phrasal marker *de* is needed to clarify the nature of the noun phrase. Different only by the phrasal marker *de* in surface, (27a) as a verb phrase and (27b) as a noun phrase are totally different in syntax.

- (27) a. *mai qiche*
sell car
'to sell car'
b. *mai de qiche*
sell ATT car
'the car to sell'

At the bottom of the Chinese nominal continuum are nominalizations. In addition to the example *you qian de* (have money NOM) 'the rich' in (1a), two more cases of nominalization are given in (28) to show that when *de* occurs at the end of a noun phrase, it functions as a grammatical marker to form a new noun phrase. Although *wo* 'I' and *baba* 'dad' are nominal in nature, the addition of *de* produces a phrase without a different referent. *Wo de* does not mean 'I' but 'mine,' and *baba de* does not mean 'dad' but 'dad's' in (28a). In (28b), *de* has turned two clauses, such as 'he has bought' and 'I have bought,' into noun phrases that, in turn, function as the subject of the predicate *dou yiyang* 'all the same.' Semantically, a nominalization in (28) refers to an unspecified individual member or an unspecified subset of a kind.

- (28) a. *wo de ye shi baba de*
1st NOM also be dad NOM
'Mine is also dad's.'
b. *ta mai de he wo mai de dou yiyang*
3rd buy NOM and 1st buy NOM all same
'The one that he has bought and the one that I have bought are the same.'

In sum, the nominal continuum in (23) characterizes Chinese noun phrases through the use of *de*. A lexical word, either a proper noun with a unique reference or a common noun signaling a kind or a concept is not allowed to co-occur with *de*. The middle categories are various idiomatic expressions co-occurring with or without *de* through collocational constraints. They are therefore treated arbitrarily by native speakers either as a phrase-like element or as a word-like element reflecting the degrees of lexicalization of these expressions.

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NOTES

1. Other than human nouns, there are no plural markers for Chinese nouns in general.
2. An editor of this volume correctly pointed out that *hao de pengyou* is grammatical when used contrasting *hao* 'good' to *huai* 'bad' in *huai de pengyou* 'bad friends' that is perhaps not lexicalized.
3. The examples in (17) through (19) are taken from 彭爽、金晓艳《语言与翻译》2004: 40-42.

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PART 5

SYNTAX

**SOME TYPOLOGICAL
CHARACTERISTICS OF
MANDARIN CHINESE SYNTAX**

FUXIANG WU AND YANCHENG HE

28.1 INTRODUCTION

In terms of word order typology, Mandarin Chinese is undoubtedly a verb-object (VO) language. Syntactically, however, Mandarin Chinese exhibits some word order patterns that are unattested in other VO languages as well as some syntactic constructions that are rather rare among other languages of the world. From the perspective of language universality and specificity, this chapter explores several idiosyncratic and cross-linguistically unusual syntactic patterns in Mandarin Chinese, seeking to identify some Chinese-specific structures. The syntactic patterns addressed in this chapter are (i) some typologically idiosyncratic word order patterns in Mandarin Chinese and (ii) some cross-linguistically unusual syntactic constructions in Mandarin Chinese.

**28.2 SOME TYPOLOGICALLY IDIOSYNCRATIC
WORD ORDER PATTERNS IN MANDARIN
CHINESE**

28.2.1 The Order of Relative Clause and Noun: Rel-N

The ordering of relative clause and noun among the languages of the world exhibits the two main types of noun-relative clause (NRel) order and relative clause-noun (RelN)

order. The former is, for example, illustrated by languages like English whereas the latter is represented by languages like Japanese:

- (1) English: *the book* [that the student bought]
 Japanese: [gakusei] *ga katta hon*
 student NOM buy:PAST book
 'The book that the student bought'

According to Dryer (1992, 2007, 2009), the pair of elements of verb and object correlates unidirectionally with the pair of elements of noun and relative clause. In other words, there is a unidirectional implication between the order of verb and object and that of noun and relative clause:

- (2) VO \supset NRel; RelN \supset OV

That is to say, among the world's languages, VO order implies NRel order whereas RelN order implies OV order. The word order pattern in Mandarin Chinese, however, poses a challenge to the implicational universals of word order generalized by Dryer: Mandarin Chinese is a VO language, but the order of relative clause and head noun is RelN rather than NRel, as illustrated in (3):

- (3) 他 昨天 买 的 那 本 书。
 [ta zuotian mai de] na ben shu
 he yesterday buy REL that CL book
 'The book that he bought yesterday'

In fact, the word order matching pattern of VO & RelN like this in Mandarin Chinese is rather rare in the languages of the world. See Table 28.1.

Note that the numbers in Table 28.1 indicate the genera rather than those of languages. A genus refers to the grouping into genetic groups of different languages that are geographically adjacent to each other. Each genus consists of a number of languages. As can be seen from Table 28.1, among the languages of the world, all of the three patterns of VO & NRel, OV & NRel, and OV & RelN are common, whereas VO & RelN is extremely rare and is found only in the Chinese genus in Dryer's (1992, 2007) database.

In addition, Dryer's (2005b) data indicate that, among the 756 sample languages, only five exhibit the VO & RelN pattern: Cantonese, Hakka, and Mandarin belong to the Chinese genus while the other two are Bai (Tibeto-Burman) in Yunnan Province and Amis (an Austronesian language) in Taiwan.¹ Dryer (2005b:390) infers that the VO & RelN pattern found in the latter two languages should be the effects of Chinese influence.

Table 28.1 Order of noun and relative clause

| | AFRICA | EURASIA | SEASIA&OC | AUS-NEWGUI | NAMER | SAMER | TOTAL |
|---------|--------|---------|-----------|------------|-------|-------|-------|
| OV&RelN | 5 | 111 | 2 | 2 | 3 | 3 | 26 |
| OV&NRel | 9 | 5 | 2 | 6 | 12 | 3 | 37 |
| VO&RelN | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| VO&NRel | 21 | 8 | 12 | 3 | 11 | 5 | 60 |

Note: As indicated in this table, Dryer (1992:83-85) groups the sample languages in the database into six large geographical areas: Africa (including Semitic languages of southwest Asia), Eurasia = Europe and Asia (excluding southeast Asia), SEAsia & Oc = Southeast Asia (Sino-Tibetan, Thai, and Mon-Khmer) and Oceania (Austronesian), Aus-NewGui = Australia and New Guinea (excluding Austronesian languages of New Guinea), NAMer = North America (including languages of Mexico, as well as Mayan and Aztecan languages in Central America) and SAMer = South America (including languages in Central America except Mayan and Aztecan languages). While "the choice of areas and where to draw their boundaries is somewhat arbitrary... the goal in deciding on the areas was to have areas that appear roughly comparable in genetic and typological diversity."

Source: Dryer (1992:86).

From here we can see that it is highly possible that the word order pattern of a VO language with the RelN order is unique to Chinese.

28.2.2 The Order of Prepositional Phrase and Verb: PP-V

Among the languages of the world, the position of adpositional (prepositional/postpositional) phrase (PP) with respect to verb (V) yields two order patterns, namely V-PP and PP-V. For instance, locative adpositional phrase follows verb in a VO language such as English but precedes verb in OV language such as Japanese:

- (4) English *He is reading [in the room].*
 Japanese *Boku wa [heya de] yasunda.* 'I rested in the room.'
 I TOP room LOC rest (PAST)

Dryer (1992, 2007, 2009) claims that the correlations between the pair of elements of adpositional phrase and verb and that of verb and object are bidirectional implications, that is,

- (5) VO \Leftrightarrow V-PP; OV \Leftrightarrow PP-V

That is to say, if a language has VO order of verb and object, then the adpositional phrase and verb in the language manifest V-PP order and vice versa (i.e., if a language

has V-PP order of adpositional phrase and verb, then the language takes on VO order). On the other hand, if a language has OV order, then the adpositional phrase and verb in the language manifest PP-V order and vice versa (i.e., if a language has PP-V order of adpositional phrase and verb, then the language takes on OV order).

This word order pattern in Mandarin Chinese, once again, poses a challenge to the implicational universals of word order generalized by Dryer: Mandarin Chinese is a VO language, but the order of prepositional phrase and verb is PP-V rather than V-PP. In fact, the word order pattern of VO & PP-V in Mandarin Chinese is also extremely rare among the languages of the world. See Table 28.2.

As shown in Table 28.2, among all the six areas, the adpositional phrase generally precedes the verb in OV languages and follows the verb in VO languages. In other words, among the languages of the world, the two patterns of OV & PP-V and VO & V-PP are quite common, and OV & V-PP is relatively rare, whereas the VO & PP-V pattern is extremely rare. In fact, among Dryer's (1992:92) 625 sample languages and Dryer's (2009:186) 1,500 sample languages, the VO & PP-V pattern is attested only in the Chinese genus.

In addition, according to Dryer and Gensler (2005), there are six logically possible orders with respect to the co-occurrence of verb, object, and oblique phrase, namely, VOX (X stands for oblique phrase), XVO, XOV, OXV, OVX, and VXO, of which only the first five orders are attested in the languages all over the world, with the sixth order left unattested. Among the sample languages in Dryer and Gensler (2005), the number of languages indicating these order patterns are given in Table 28.3, again with the XVO pattern found only in Chinese genus (Cantonese, Hakka, and Mandarin).

Therefore, a VO language with PP-V order is obviously a characteristic of Chinese and is most likely a syntactic pattern unique to Chinese.

28.2.3 The Order of Standard and Adjective in Comparative: St-Adj

With regard to the order of standard and adjective in comparative, there are two order types of constructions in the languages of the world, namely Adj-St and St-Adj. For

Table 28.2 Order of verb and adpositional phrase

| | AFRICA | EURASIA | SEASIABOC | AUS-NEWGUI | NAMER | SAMER | TOTAL |
|---------|--------|---------|-----------|------------|-------|-------|-------|
| OV&PP-V | 8 | 14 | 3 | 10 | 17 | 11 | 63 |
| OV&V-PP | 5 | 0 | 0 | 0 | 0 | 4 | 9 |
| VO&PP-V | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| VO&V-PP | 17 | 7 | 13 | 4 | 14 | 4 | 59 |

Source: Dryer (1992:92, 2007, 2009).

Table 28.3 The co-occurrence pattern of verb, object, and oblique phrase in the world's languages

| | |
|---|-----|
| 1. Verb-object-oblique order (VOX) | 189 |
| 2. Oblique-verb-object order (XVO) | 3 |
| 3. Oblique-object-verb order (XOV) | 45 |
| 4. Object-oblique-verb order (OVX) | 23 |
| 5. Object-verb-oblique order (OVX) | 37 |
| 6. More than one order with none dominant | 152 |
| Total | 449 |

Note: According to Dryer and Gensler (2005:342), an oblique phrase is a noun phrase or adpositional phrase (prepositional or postpositional) that functions as an adverbial modifier (or "adjunct") of the verb. For example, the prepositional phrase "in the house" in "They repair televisions in the house," is an oblique phrase.

Source: Based on Dryer and Gensler (2005).

example, comparative construction in a VO language such as English employs the Adj-St pattern while in an OV language such as Japanese it employs the St-Adj pattern:

(6) English: *You are prettier than your sister.*

Adj St

Japanese: *Tokyo-wa Sapporo-yori atatakai.* 'Tokyo is warmer than Sapporo.'

Tokyo-TOP Sapporo-M warm

St Adj

Dryer (1992:91, 2007:72, 130; 2009:186) shows that the correlations between the pair of elements of verb and object and that of adjective and standard in comparative construction are bidirectional implications, that is,

(7) VO <=> Adj St: OV <=> St Adj

This means that, in the languages of the world, VO order of verb and object implies Adj-St order in comparative construction and vice versa. On the other hand, OV order of object and verb implies St-Adj order in comparative construction and vice versa.

In Modern Chinese, the order of the comparative *bi* construction is St-Adj (see example [8], where *bi*, glossed as M, functions as a comparative marker). As a VO language, Chinese exhibition of this order pattern poses another challenge to the implicational universals of word order typology. Meanwhile, the order pattern of VO & St-Adj in Mandarin Chinese is also extremely rare among the languages of the world. See Table 28.4.

Table 28.4 Order of adjective and standard in comparative construction

| | AFRICA | EURASIA | SEASIBOC | AUS-NEWGUI | NAMER | SAMER | TOTAL |
|----------|--------|---------|----------|------------|-------|-------|-------|
| OV&StAdj | 5 | 13 | 5 | 0 | 5 | 3 | 29 |
| OV&AdjSt | 2 | 1 | 0 | 0 | 1 | 3 | 7 |
| VO&StAdj | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| VO&AdjSt | 5 | 7 | 8 | 0 | 7 | 4 | 31 |

Source: Dryer (1992:92).

(8) 张三 比 李四 高。

Zhangsan bi Lisi gao

Zhangsan M Lisi tall

'Zhangsan is taller than Lisi.'

As indicated in Table 28.4, among the languages of the world, the two patterns of OV & St-Adj and VO & Adj-St are quite frequent, and OV & Adj-St is relatively rare, whereas the VO & St-Adj pattern is extremely rare. In fact, among both Dryer's (1992, 2007) over 600 sample languages and Dryer's (2008, 2009) over 1,500 sample languages, the VO & St-Adj pattern is attested only in the Chinese genus. It follows that a language with a VO order that has a St-Adj order in its comparative construction is probably a characteristic highly unique to Chinese.

28.3 SOME CROSS-LINGUISTICALLY UNUSUAL SYNTACTIC CONSTRUCTIONS IN MANDARIN CHINESE

28.3.1 The Polar Question: A-not-A

Interrogative clauses in the languages worldwide can be functionally divided into three types, that is: the polar question (also known as the yes/no question), the content question, and the alternative question. Typologically, one striking feature of Chinese interrogative clauses is that, apart from the sentence-final "ma" question clause (9a), the V-bu-V structure (the so-called A-not-A construction) is another device in forming a polar question (9b):

(9) a. 你 吸 烟 吗?
Ni xi yan ma?

2SG smoke cigarette Q

b. 你 吸 不 吸 烟?
Ni xi bu xi yan?
2SG smoke bu smoke cigarette
'Do you smoke?'

It is worth noticing that the A-not-A construction is not mentioned in the typology of polar questions proposed by both Sadock and Zwicky (1985:181) and Dryer (2005a). Maybe they both, like Ullian (1978), consider it an alternative question. An alternative explanation is that this question-forming device is rather rare among the languages of the world, which happened to be unattested in their sample languages.

In fact, there are several pieces of evidence demonstrating that the A-not-A construction is really a rare question pattern among the languages of the world.

First, Siemund (2001:1016) observes that some languages employ disjunctive structure (X or not X) to encode the polar question, with the exemplification of the very question pattern of A-not-A type in Mandarin Chinese like (10), and claims that such a pattern in Mandarin Chinese has undergone grammaticalization into a common strategy of forming polar questions. Meanwhile, he points out that the employment of "disjunctive structure" as a device of expressing polar questions like the A-not-A pattern in Mandarin Chinese is very rare in human languages (see Siemund 2001:1012).

(10) 他 在 家 不 在 家?
Ta zai jia bu zai jia?
he beat home bu beat home
'Is he at home (or not)?'

Second, according to the literature, the polar question of the A-not-A type is seldom reported in languages outside Southeast Asia. The possible exceptions we have learned of so far are Turkish and Kobon. Harris and Campbell (1995:295) mention that the polar question similar to the A-not-A type in Mandarin Chinese is also attested in Turkish, in which the A-not-A structure is accompanied by a sentence-final interrogative particle:

(11) Kadın tarla-ya git-ti-mi? git-me-di-mi?
woman field-DAT go-PAST-Q go-NEG-PAST-Q
'Did the woman go to the field (or didn't she go)?'

In this example, an affirmative verb form, *git-ti-mi*, and its negative counterpart, *git-me-di-mi*, are juxtaposed. However, just as emphasized by Harris and Campbell (1995:295), the Turkish construction differs from the Mandarin Chinese not only in that the former uses a question particle but also in that the aforementioned Turkish construction is fully grammatical even without the "-not-A" portion (i.e., *git-me-di-mi*) of the construction. In fact, the polar question in Turkish is expressed mainly via question

particle. And it is out of this very consideration that Turkish is unexceptionally grouped into languages of question particle type in such typology literature as Ullan (1978), Sadock and Zwicky (1985), Haspelmath et al. (2005), and König and Siemund (2007). Another possible exception is Kobon, a language in Papua New Guinea (genetically belonging to the Trans-New Guinea family), which, according to Miestamo (2007), also forms a polar question via disjunction (A-not-A):

- (12) Kobon (Miestamo 2007)
- a. *Yad kaj mid-öp.*
1SG pig be-PERF_{3SG}
'I have a pig/pigs.'
- b. *Ne kaj ap mid-öp (aka) mid-ag-öp?*
2SG pig INDEF be-PERF_{3SG} (or) be-NEG-PERF_{3SG}
'Have you any meat?'

In this example, however, a disjunctive conjunction *aka* can occur between the affirmative and negative forms of the verb, which suffices to say that this example is not a typical A-not-A polar question.

Third, according to Yue-Hashimoto (1993:41), the terminology 'A-not-A' was first used by Chao (1947). It was nonexistent in previous linguistic literature. This throws a sidelight on the fact that the A-not-A polar question is rather rare in the world's languages. To sum up, the A-not-A pattern of polar question similar to V-bu-V structure in Mandarin Chinese is rarely attested among the world's languages. It is, therefore, a polar question pattern uniquely employed in languages in China. As for the A-not-A pattern of polar question found in minority languages in southern China, Wu (2008) observes that it is a result of the effects of the Chinese influence, specifically a process of replicating the Chinese pattern of V-bu-V. So it seems that the A-not-A pattern of polar question is a syntactic pattern that characterizes Chinese.

28.3.2 The Potential Complement Construction V-de-C and V-bu-C

Many languages in the world use the modal verb, auxiliary, particle, or affix to express modality (Bybee et al. 1994). Mandarin Chinese is somewhat unusual in that apart from the auxiliary and particle, it also uses potential complement construction V-de-C/V-bu-C to express modality.² For example:

- (13) a. 这 东西 太 沉 小孩 拿 不 动, 大人 才 拿 得 动。
Zhe dongxi tai chen, xiaohai na bu dong, daren cai na de dong.
this staff too heavy child lift bu move adult only lift de move

- 'This staff is extremely heavy, so a child can't lift it and only an adult can.'
- b. 外边 下雨 咱们 出 得 去 出 不 去?
Waidian xiayu, zamenmen chu de qu chu bu qu?
outside rain INTC exit de go exit bu go
'It is raining outside, so can we go out?'

Semantically, potential complement construction V-de-C/V-bu-C in Chinese usually expresses only two subtypes of situational possibility, namely (a) participant-internal possibility and (b) participant-external possibility.

There is evidence indicating that the Chinese type of potential complement construction V-de-C/V-bu-C expressing situational possibility is rare among the languages in the world.

First, a survey of seventy-six sample languages worldwide reported in Bybee et al. (1994:181-182, 188-189) reveals that the most frequently seen expression of nonepisodic modality (i.e., situational modality) is with an auxiliary or modal verb and then with an affix (largely suffix) and particle, but with syntactic construction no cases have ever been reported.

Second, van der Auwera and Ammann (2005) group the expression of situational possibility into three types, namely (i) verbal affixes, (ii) verbal constructions, and (iii) other markers, including particles, adverbials, nouns, adjectives, and some complex clausal constructions.

According to van der Auwera and Ammann (2005), among the languages of the world, languages that use the second type of strategy (i.e., verbal construction) for expressing situational possibility are the most frequent, and those of the first type are next, while those of the third type are the least. The numbers of different types of languages are illustrated in Table 28.5.

Since the strategies of expressing situational possibility of the first two types in Table 28.5 bear no relations to syntactic constructions, a simple look into the thirteen languages of the third type may reveal whether there exists in the sample languages reported in van der Auwera and Ammann (2005) a syntactic construction similar to the V-de-C/V-bu-C construction in Chinese used to express situational possibility. The

Table 28.5 Expression of situational possibility among world languages

| | |
|--|-----|
| 1. The language can express situational possibility with affixes on verbs. | 63 |
| 2. The language does not express situational possibility with affixes on verbs but with verbal constructions. | 158 |
| 3. The language does not express situational possibility with affixes on verbs or with verbal constructions but with other kinds of markers. | 13 |
| total | 234 |

Source: van der Auwera and Ammann (2005).

strategies used to express situational possibility in these thirteen languages are shown in Table 28.6.

Table 28.6 reveals that among the thirteen languages of the "other markers" type, no single language employs complement construction to express situational possibility in the way Chinese does. In other words, among the 234 cross-area and cross-family sample languages reported in van der Auwera and Ammann (2005), no case is found of expressing situational possibility modality with complement construction similar to V-de-C/V-bu-C in Chinese.

Third, the potential complement construction V-de-C/V-bu-C in Chinese is derived from the grammaticalization of the resultative complement construction V-de-C/V-bu-C, which in turn ultimately derives from the serial verb construction (Wu 2002a). Note that the potential complement construction V-de-C/V-bu-C and the resultative complement construction V-de-C/V-bu-C are identical in surface structure, so specific contexts are needed to tell the differences in meaning between them. Compare (14a) and (14b):

- (14) a. 这件衣服洗得干净, (那件衣服洗得不干净。)
Zhe jian yifu xi de ganjing, (na jian yifu xi de bu ganjing)
 this CLF garment wash de clean that CLF garment wash de NEG clean
 'This garment was washed clean, (and that one was not washed clean).'
 (Resultative complement)

Table 28.6 Situational possibility marking strategies in the thirteen languages with "other markers"

| Language names | Situational possibility marking strategies | | | | Sources |
|----------------------|--|---|---|-----|--------------------------------|
| | P | A | N | CCC | |
| Amele | | + | | | van der Auwera and Ammann 2005 |
| Burmese | | + | | | Soe 1999 |
| Chukchi | | + | | | van der Auwera and Ammann 2005 |
| Kayah Li (Eastern) | | + | | | Solnit 1997 |
| Korean | | | + | + | Wyman 1996 |
| Kutenai | | + | | | Morgan 1991 |
| Naga (Mao) | | + | | | Girdhar 1994 |
| Nahuatl (Tetelcingo) | | + | | | Tuggy 1979 |
| Nubian (Dongolose) | | + | | | Abdel-Hafiz 1988 |
| Slave | | + | | | Bybee et al. 1994 |
| Ungarinjin | | + | | | Coate and Oates 1970 |
| Warmbaya | | + | | | Nordlinger 2006 |
| Yurok | | + | | | Robins 1958 |

Note: P = particles; A = adjectives; N = nouns; CCC = complex clausal constructions.

- b. 这件衣服洗得干净, (那件衣服洗得不干净。)
Zhe jian yifu xi de ganjing, (na jian yifu xi de bu ganjing)
 this CLF garment wash de clean that CLF garment wash bu clean
 'This garment can be washed clean, (and that one cannot be washed clean).'
 (Situational possibility complement).

Since the resultative complement construction is derived from the serial verb construction and the latter is usually related to the typology of analytic morphology,³ we can probably predict that languages of nonanalytic morphology with no serial verb constructions are unlikely to manifest the resultative complement construction as a means of expressing situational possibility. Cross-linguistic survey reveals that, while analytic languages with serial verb constructions are common mainly in Africa (West Africa) and Southeast Asia, no reports have been published on the existence of the potential complement construction among the languages in these two areas. Although the existence of some potential complement constructions similar to Chinese V-de-C/V-bu-C in some minority languages within China is reported (e.g., Mulao [Bo 2003]; Bugeng [Li 2005]; Mian [Mao et al. 1982]; She [Mao and Meng 1986]), it is probably an effect of Chinese influence. In a word, the potential complement construction V-de-C/V-bu-C in Chinese is a rarely seen syntactic construction among the languages of the world and thus is probably a syntactic phenomenon unique to Chinese.

28.4 CONCLUSION

In this chapter five distinctive syntactic patterns in Chinese have been discussed, of which the first three, namely Rel-N, PP-V, and the comparative construction St-Adj, are of word order patterns that are extremely rare in SVO languages and the last two, namely the polar question pattern A-not-A and the potential complement construction V-de-C/V-bu-C, are of construction patterns that are so special that they are rarely seen among languages of the world.⁴ Why does Chinese have such extraordinary word order patterns and constructions? The answer probably lies in the "areal diffusion" from Altaic languages (Dryer 2003:51–53), or in the specific history of Chinese syntactic changes. Whatever the cause it may be, in relation to these extraordinary syntactic patterns, no satisfactory answers have been offered so far and further exploration is thus still needed.

NOTES

1. Dryer's (2009:186) later observation based on a sample of 1,500 languages is corroboration of this conclusion.
2. The potentiality of the potential complement construction "V-de-C"/"V-bu-C" is expressed by the whole rather than the "de"/"bu" portion of the construction (see Wu

- 2002b). As for the grammatical status of "de" and "bu" in the construction, Wu (2002b) states that "de" is a structural particle and "bu" a negative adverb.
3. As to the association of typological profile with verb serialization, Aikhenvald (2006:53) states that serial verb constructions have different formal properties that tend to correlate with different linguistic types. However, productivity and functions of verb serialization are important factors in determining whether a particular language is a serializing language (i.e., with serial verb constructions). A few familiar European languages have a restricted set of contiguous sequences of verbs, such as *go get*, *go eat* in American English, but these are not considered serial verb constructions, for, among other reasons, they are restricted to a particular tense, aspect, or mood form (Aikhenvald 2006:45–46).
4. Word order patterns such as PP-V, Rel-N, and St-Adj are considered as the characteristics of Chinese syntax in Liu (2003, 2008) and Zhang (2010).

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CHAPTER 29

TOPIC PROMINENCE

LIEJIONG XU

29.1 TOPIC AND TOPIC PROMINENCE

A pragmatic assertion consists of a topic and a comment. The topic is what the comment is said about and the comment is what is said about the topic. The topic is used to invoke knowledge in the possession of an audience, thus typically associated with old or given information. The comment, on the contrary, provides new information.

Topic is a syntactic notion as well as a pragmatic notion. Gundels (1988) generalization from an investigation of thirty languages states that all of them have syntactic topic constructions. Language indicates topic by means of structural position, morphological markers, intonation, or some combination thereof.

Some languages give topic more prominent grammatical manifestation. For instance, these languages may use word order, first and foremost, to encode informational functions rather than thematic functions. Other features associated with topic prominence include marginal or no use of the passive construction, absence of dummy subjects like *it* or *there* used in English, and so on. A linguistic typology was proposed to distinguish topic-prominent languages and subject-prominent languages in Li and Thompson (1976). Later, languages in which the words in a sentence are ordered according to the discourse functions came to be called 'discourse-configurational.' According to Kiss (1995), a language is discourse-configurational if the discourse function of topic or focus is expressed through a particular structural relation (i.e., associated with a particular structural position).

29.2 SOME PROPERTIES OF CHINESE TOPIC STRUCTURES

The Chinese language has been taken as a representative of topic-prominent languages since Li and Thompson (1976), and topic prominence is often regarded as one of the

characteristic properties of Chinese sentences. The topic structure, a grammatical configuration consisting of a topic and a comment clause, occurs much more frequently in Chinese than in non-topic-prominent languages like English. Having compared a corpus of oral Beijing Mandarin and an English speech corpus, Liu (2009:108–109) finds that topic structures occur fifty-seven times more in Chinese than in English.

Topic prominence is not just shown in frequency count. Compared with English, Chinese has a greater variety of topic structures. The English sentences in (1a) and (1b) are topic structures containing an empty element and a pronoun, respectively, in the comment anaphorically related to the topic. The former is an example of topicalization and the latter is one of left dislocation. The sentences in (2a) and (2b) are their Chinese counterparts.

- (1) a. This set of books, you may take away.
 b. This set of books, you may take it away.
- (2) a. Zhe tao shu, ni keyi na zou.
 this set books you may take away
 b. Zhe tao shu, ni keyi na zou ta.
 this set books you may take away it

In addition to topicalization and left dislocation, Chinese also has other ways to form topic structures that have no counterparts in English.

- (3) Zhe tao shu, ni keyi na zou ji ben
 this set books you may take away a-few volumes
 'You may take away a few volumes of this set of books.'

This sentence means you may take away a few volumes but not the complete set. Here the topic expression *zhe tao shu* is semantically related to *ji ben* in the comment clause. The relation that holds between them is a part-whole relation but not a coreferential relation. This is a typical example of what Chafe (1976) calls a "Chinese-style" topic, to be distinguished from an "English-style" topic, in which an empty or pronominal element in the comment is anaphorically related to the topic. They are called linked and unlinked topic constructions in Lambrecht (1994:193). Before addressing Chinese-style topics in detail, let us first briefly mention some other syntactic properties of Chinese topic structures.

Like in many other languages, topic in Chinese is typically situated sentence initially. However, alongside the topic structure in (4a), one also finds the synonymous form in (4b), where the topic occurs between the subject and the verb:

- (4) a. Zhe ben shu ta mei du
 this CL book he not read
 'This book, he has not read.'
 b. Ta zhe ben shu mei du.
 he this CL book not read

The preverbal nominal expression *zheben shu* in (4b) is known as the subtopic or secondary topic in the literature.¹

Unlike some other topic-prominent languages such as Japanese and Korean, Chinese does not require topic to be morphologically marked, though it does have a number of topic markers (e.g., *ne, ya, ba, a, me*), and they are quite frequently heard in speech. Alternatively, the topic may be phonologically separated from the comment by a pause. The presence of a marker and/or pause is optional for both primary and secondary topics.

- (5) a. Zhe ben shu ne ta mei du
 this CL book PAR he not read
 'This book, he has not read.'
 b. Ta zhe ben shu ne mei du
 he this CL book PAR not read

Another notable feature is the frequent occurrence of multiple topics. Liu (2009) cites a large number of samples from the transcription of a corpus of modern spoken Beijing Mandarin in her study. What follows is one of her examples.

- (6) Wo na laoda ya, zhe xifur ne, ta jiu you dian xiangfa
 my that first-child PAR, this wife PAR she then have a-little dissidence
 'As for my first child, his wife, she has some dissidence.'

Research on topic in Chinese has been pursued within different theoretical frameworks, formal and functional. It has produced numerous empirical insights and led to heated discussion. In the following sections we address various types of topic structures used in Chinese and some of their controversial issues.

29.3 ENGLISH-STYLE TOPIC STRUCTURES IN CHINESE

It is a hypothesis commonly accepted by researchers in the frameworks of generative grammar that topic structures in English such as (1a) are derived by syntactic movement. Its empirical basis is the observation that the comment clause *you may take away* is an ungrammatical form. The transitive verb *take* requires an object. The topic structure (1a) is grammatical presumably because the nominal expression *this set of books* was originally the verbal object and in the derivational process it moved to the initial position to become the sentence topic. Moving an element across the clause boundary to a nonargument position is called wh-movement, analogous to moving a wh-expression forward to form an interrogative sentence such as *which book did he take away?* Consequently, a

gap is left at the postverbal position, which is called wh-trace or variable.² So the condition that a transitive verb has an object was satisfied in the derivational history, though it does not appear so in the surface form.

This analysis readily applies to Chinese topic structures like (2a) but not to Chinese-style topic structures like (3), in which the verbal object position is occupied by another nominal expression *ji ben*. In view of the fact that English-style topic structures and Chinese-style topic structures coexist in Chinese, researchers hold three different views: (i) The former are derived by movement but the latter are not; (ii) neither the former nor the latter are derived by movement; and (iii) the latter as well as the former are derived by movement. We consider the first two views in this section and the third one in Section 29.5.

The first view seems to be natural and straightforward; however, it has technical difficulties. Since it involves wh-movement, a Chinese topic structure is expected to share some syntactic properties common to other structures that have undergone wh-movement in other languages. Specifically, it should observe Island Constraints like Subadjacency, the Bijection Principle, and the Strong Crossover Condition. At the time when this issue was brought up, linguists' views differed as to whether Chinese topic structures are subject to these conditions and whether they should be taken as diagnostic tests for variable-binding in Chinese topic structures. See the arguments and counter-arguments documented in Xu and Langendoen (1985), Xu (1986), Huang (1987), and Huang (1992).

Leaving aside the technical discrepancies among generative linguists, we return to the basic empirical fact that motivates the movement hypothesis for topic structures mentioned at the beginning of this section. Let us carefully compare the English sentence (1a) and its Chinese counterpart (2a). The English verb *take* and the Chinese verb *na* seem to be semantically equivalent, but there is a hidden crucial difference. The former is always transitive, whereas the latter is either transitive or intransitive. The contrast is shown below:

- (7) a. *You may take away.
 b. Ni keyi na zou.
 you may take away

The forms (7a) and (7b) are the comment clauses contained in (1a) and (2a), respectively. Since (7b), unlike (7a), is grammatical, the motivation for the movement hypothesis exists only for (1a) but not for (2a). To test whether similar motivation exists at all in Chinese, one should test grammatically transitive verbs in Chinese rather than those that are synonymous to English transitive verbs. Most Chinese verbs are amphibious, but there are a relatively small number of them that strictly require an overt object present. *Fanrong* 'boom' and *wennuan* 'warm' are two examples. Now let us see whether the object of a strictly transitive verb allows topicalization. The following sentences are drawn from Xu (2005:142). The contrast between (8a) and (9a) on the one hand and (8b) and (9b) on the other shows that moving the object of a Chinese transitive verb to the topic position fails to make the sentence grammatical.

- (8) a. Xin zhengce hui fanrong/jinrong shichang.
 new policy will boom money market
 'The new policy will cause the money market to boom.'
 b. *Jinrong shichang, xin zhengce hui fanrong \emptyset .
 money market new policy will boom
 'The money market, the new policy will cause to boom.'

- (9) a. Tade hua wennuan-le womende xin.
 his words warmed-ASP our hearts
 'His words warmed our hearts.'
 b. *Womende xin, tade hua wennuan-le \emptyset .
 our hearts his words warmed-ASP
 'Our hearts, his words warmed.'

We further test the pivotal construction in which a postverbal nominal expression takes a dual role. It is the object of the verb in the main clause and the subject of the verb in the embedded clause. When the verb *qing* appears in the pivotal construction, it requires an overt object, thus (10b) is ungrammatical just like its English counterpart.

- (10) a. Women qing-le Wang jiaoshou zai hui shang fayan.
 we invite-ASP wang professor PREP meeting at speak
 'We invited Professor Wang to speak at the meeting.'
 b. *Women qing-le \emptyset zai hui shang fayan.
 We invite-ASP PREP meeting at speak
 '**We invited to speak at the meeting.'

Now move the object *wang jiaoshou* at the beginning of the sentence to make it a topic and leave a gap in the postverbal position. What we have is an ungrammatical Chinese sentence (11a), in contrast to its English counterpart. To get a grammatical topic structure, a resumptive pronoun is required as in (11b).

- (11) a. *Wang jiaoshou women qing-le \emptyset zai hui shang fayan.
 Wang professor we invite-ASP PREP meeting at speak
 'Professor Wang, we invited to speak at the meeting.'
 b. Wang jiaoshou women qing-le ta zai hui shang fayan.
 Wang professor we invite-ASP he PREP meeting at speak
 'Professor Wang, we invited him to speak at the meeting.'

These facts lead some linguists to believe that in Chinese even a so-called English-style topic structure (i.e., one with a gap in the comment clause anaphorically bound to the topic) is not derived by movement. In terms of Chomsky's minimalism, the topic and the comment are joined by Merge, not by Move. Whether the topic is coreferential with a gap or a pronoun as in (2a) and (2b) or is semantically associated but not coreferential with a full noun phrase in the comment as in (3), the relation is established likewise by an interpretation rule rather than a syntactic movement rule.

29.4 CHINESE-STYLE TOPIC STRUCTURES

In the next two sections we address the relation between the topic and the comment in Chinese-style topic structures. In a great many cases the topic is semantically related to a certain expression in the comment. Typical relations include those of whole and part, set and member, possessor and possessed. Here are a few examples, some of which are repeatedly cited in the literature.

- (12) Na_ke shu, yezi da
that CL tree leaves big
'The leaves of that tree are big.'
- (13) Shuiguo, pingguo zui haochi
fruit apple most delicious
'As for fruit, apples are most delicious.'
- (14) Yanyuan, xiangmao hen zhongyao
actress appearance very important
'As for actresses, their appearance is very important.'

Such sentences are called double nominative constructions by some grammarians (e.g., Teng 1974; Tsao 1990). An easily available analysis is taking the first noun phrase to be the modifier of the second one, thus denying it the status of topic (Schlobinski and Schütze-Coburn 1992). But this is not a generally possible solution. This proposal can be ruled out by inserting a parenthetical expression, for instance *jushuo* 'reportedly', between the two noun phrases. A modifier-modified sequence does not permit such insertion. The whole-part relation, the set-member relation, and the possessor-possessed relation remain intact with the parenthetical expression in between.

The topic can be semantically related to an expression in object position as well as in subject position. There is no subject-object asymmetry.

- (15) Na_ke shu, women zhi kanjian yezi
that CL tree we only see leaves
'As for that tree, we only see its leaves.'

- (16) Shuiguo, wo zui xihuan pingguo
fruit I most like apples
'Of fruit I like apples most.'

- (17) Yanyuan, ni bu neng zhi kan xiangmao
actress you not can only look appearance
'As for actresses, you cannot just look at their appearance.'

One may notice that some comment clauses in these examples contain a focus-sensitive operator, that is, *zhi* 'only' or *zui* 'most'. Its presence is not obligatory. The following sentences are fully grammatical.

- (18) Wang Degang, meiyou ren gan dongyi geng hanmao
Wang Degang no man dare touch one CL hair
'No one dares to touch a hair of Wang Degang.'
- (19) Na_ge xianyifan, jingcha zai cha dangan
that CL suspect police ASP examine record
'The police are examining that suspect's records.'

Then what is the role of the focus-sensitive operator? Why does its presence increase the acceptability of a topic structure, at least in some cases?

Researchers commonly use *aboutness* as a convenient and general term to cover various topic-comment relations. It is taken as a primitive. Few attempts have been made to define it more precisely and to explain what it means for a sentence to be about the topic. Recently Hu and Pan (2009:375) proposed a topic licensing condition to elaborate the notion of aboutness: 'A topic can be licensed if and only if there is a set Z induced by a variable x in the comment, and the set Z thus generated does not produce an empty set when intersecting with the set T denoted by the topic.' It readily accounts for cases like (13) and (16), where apples are a subset of the set of fruit. It also applies to cases involving the possessor-possessed relation or the whole-part relation discussed previously. In such cases the topic generates a set of all parts or all things possessed, which intersects the set induced by the relevant variable in the comment. The licensing condition also explains why (20b) is felt to be more acceptable than (20a).

- (20) a. * You'eryuan de xiaohai, Zhangsan jiao erzi huahua.
kindergarten Mod children Zhangsan teach son draw-pictures
'As for the children in the kindergarten, Zhangsan teaches his son to draw pictures.'
- b. You'eryuan de xiaohai, Zhangsan zhi jiao erzi huahua.
kindergarten Mod children Zhangsan only teach son draw-pictures
'As for the children in the kindergarten, Zhangsan only teaches his son to draw pictures.'

The latter sentence is more acceptable with the focus operator *zhi*. Focus implies a set of alternatives, which intersects the set generated by the topic, a set of kindergarten children. The presence of the focus operator helps bring to mind the set relation.

In this section we have considered topic structures containing a full nominal expression in its comment clause that is semantically related but not syntactically anaphoric to the topic. They belong to the class of Chinese-style topics. English does not have similarly structured sentences. Researchers who prefer to analyze Chinese topic structures in alignment with English topic structures take the sentence-initial expression as the subject rather than the topic and take the comment clause as its predicate. In other words, the predicate itself contains a subject and a predicate. To distinguish them, the two subjects are called *big subject* and *small subject*, respectively. The two terms date back to Chao (1968). For instance, in the following sentence, the personal pronoun *tamen* 'they' is the big subject and the indefinite pronoun *shui* 'who' is the small subject.

- (21) Tamen, shui dou bu lai.
they who all not come
'None of them are coming.'

This analysis is commonly accepted by Chinese grammarians working in the structuralist tradition in favor of purely structural terms.³

29.5 STRUCTURES WITH A RANGE TOPIC

In a Chinese-style topic structure the topic is not always related to a certain nominal expression in the comment clause. In some cases it is related to the comment as a whole but not to any particular element in it. McCawley (1976) uses the terms *instance topic* and *range topic* to distinguish the two types of topic in Japanese. Chinese have the same distinction. Chen (1996) further recognizes a subclass of range topic, which he calls *frame topic*. A range topic is one that delimits the range of a variable of which the predication is made. A frame topic is one that provides the spatial, temporal, and individual frame within which the proposition holds true. We use the general term *range topic*. The following are some illustrations.

- (22) Beijing, mingshengguji duo
Beijing historical-site many
'There are many historical sites in Beijing.'
- (23) Nei chang huo, xingkuai xiaofangdailai de_kuai.
that CL fire fortunately fire-brigade come Mod quickly
'As for that fire, fortunately the fire-brigade came quickly.'

- (24) Wujia, Niuyue zui gui
price New York most expensive
'Speaking of prices, New York is the most expensive.'

Topic structures of this type have no equivalents in English. Of course, this does not mean that English or other Indo-European languages have no way to express special, temporal frame or delimit the range of variables as Chinese does. In these languages range topic is a pragmatic notion realized in different syntactic forms. Zribi-Hertz (2009) provides the following French examples when she refutes Huang's (2000) proposal to use range topic as a diagnostic test to distinguish syntactic languages like English, French, and other Indo-European languages and pragmatic languages like Chinese, Japanese, and Korean.

- (25) A Pèkin, les monuments historiques sont nombreux.
LOC Beijing DEF.PL site.PL historical.PL be.PRS.3PL many.MPL
'In Beijing there are many historical sites.'
- (26) Pour/quant à cet incendie, heureusement les pompiers sont
For/as-for DM.MSG fire fortunately DEF.PL firemen AUX.PRS.3PL
venu tout de suite.
come. PP.MPL right away

'As for the fire, fortunately the fire-brigade came right away.'

The difference between Chinese on the one hand and English and French on the other seems to be as follows: As a topic-prominent language, the former sets aside an inherent structural position to host a nominal expression as topic whereas the latter has to create an adjunct position for it by means of locative marking or lexical specification.

Grammarians who prefer to see Chinese topic structures in alignment with English sentences have proposed various assumptions to eliminate Chinese-style range topics. Take (23) for example. One way, proposed in Shi (2000), is to assume that the sentence is somehow incomplete and therefore can continue as follows.

- (27) buran Ø hui shao-si bu-shao ren.
otherwise will burn-death not-few people
'otherwise, it would have burned many people to death.'

Since this sequential clause contains a gap anaphoric to the topic *nei chang huo* at the beginning of (23), the entire discourse, that is, (23) plus (27), can be taken as an expanded English-style topic structure.

An alternative solution proposed in Huang and Ting (2006) is to take *nei chang huo* as an adverb rather than a topic. Chinese has no morphological marker to distinguish nouns and adverbs in general. The authors observe that in English some noun phrases

occasionally act as adverbials (e.g. *that way*) and argue that *nei chang huo* can be taken as an adverb as well.

The third way is to assume that *nei chang huo* is preceded by a null preposition *zhiyu* 'as for'. So the difference between the Chinese sentence in (23) and the English sentence and the French sentence provided by Zribi-Hertz in (26) is reduced to the difference between null prepositions and overt prepositions. Various prepositions and locative particles have been proposed to precede sentence-initial noun phrases and then get deleted by a syntactic operation of preposition drop. In this way the (b) forms (i.e., Chinese-style topic structures) in the following examples are presumably derived from the (a) forms.

- (28) a. Wei zhe _jian shi, ni bu neng guang mafan yi ge ren
for this CL matter you not can only bother one CL person.

'For this matter, you cannot just bother one person.'

- b. Zhe _jian shi, ni bu neng guang mafan yi ge ren
(29) a. Zai shengwu-lunlixue fangmian wo shi menwaihan.

at bioethics side I be layman

'With regard to bioethics, I am a layman.'

- b. Shengwu-lunlixue, wo shi menwaihan.

Reductionists claim that all Chinese-style topic structures can be nullified one way or another. However, typologists maintain that the difference between Chinese and English in topic structures persists and that topic prominence in Chinese is real.

NOTES

1. Some Chinese grammarians call it focus rather than topic, probably having in mind the well-known fact that this preverbal position is designated for focus in some languages, for instance in Hungarian. But *zheben shu* in (4b) as well as *zheben shu* in (4a) expresses given information and does not pass the two tests for identificational focus used in Kiss (1998). See Xu (2006) for the tests on Chinese subtopics.
2. A more sophisticated hypothesis is that the initial nominal expression is base-generated in the topic position and that an abstract element moves from the verbal object position to somewhere adjacent to the topic expression. Technical details need not concern us here.
3. One of the arguments in support of taking *tamen* as a subject is the fact that the modal verb *keyi* 'may' may appear between *tamen* and *shui*. However, whether *keyi* is a modal verb or not is questionable. It may precede a subject as well (cf. *keyi tamen xian lai* 'they may come first'). For critical comments on such double subject analysis, see Xu (2005) and Pan and Hu (2008).

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CHAPTER 30

REFERENTIALITY AND
DEFINITENESS IN CHINESE

PING CHEN

30.1 REFERENTIALITY

The concept of referentiality has attracted attention from logicians, philosophers, and linguists since Greco-Roman times as being essential to capturing many intriguing features concerning the relationship between language, human cognition, and the external world and, most importantly for linguists, the structure, use, and evolution of languages. More recent research focuses on four major aspects of the concept—logico-philosophical, semantic, pragmatic, and discourse thematic.

30.1.1 Logic-Philosophical Referentiality

Logicians and philosophers, Frege (1892), Russell (1905, 1919), Strawson (1950, 1964), and Donnellan (1966) among the most influential, have taken a keen interest in the referentiality of linguistic expressions since the turn of the 20th century, as they aimed to determine how to ascertain what people say or believe is true or false as part of their research agenda to establish a general theory of meaning. Their works have had strong impacts and ramifications on linguists both in the delineation of the range of linguistic phenomena coming under investigation and in the definition and use of important terms and concepts related to referentiality. To Bertrand Russell, and most logicians, philosophers, and linguists working in the broadly neo-Russellian framework, the term “referential” is confined to logically proper names, demonstratives like *this* and *that*, and indexicals like *I*. Logically proper names, demonstratives, and indexicals, in the Russellian tradition, are inherently referring expressions, whereas other linguistic words and phrases, such as definite and indefinite descriptions, are not.

30.1.2 Semantic Referentiality

Semantic referentiality is a property encoded in the semantics of linguistic expressions that essentially serves the function of directly “referring” or pointing to some existent entity in a model of discourse. Semantics of expressions in some grammatical categories may be factorized into two components, one descriptive, like “city” in “the city” the other purely referential, as “the” in the same phrase. Some linguistic expressions, most notably proper names, pronouns, demonstratives, and definite articles like the English *the*, because of the semantics encoded in their form, are regarded as “inherently” semantically referential with little or no descriptive content. In contrast, there are some inherently nonreferential expressions, like English quantifiers *none*, *no*, and *neither*, which serve to negate the referential existence of the relevant denotations. What are known as partitive quantifiers, such as *each*, *every*, *all*, *both*, and *most*, while entailing the existence of a background set, are also inherently nonreferential in that they refer to a subset of the background set, rather than a specific individual entity in the set. All of these quantifiers are taken to be semantically nonreferential.

As is discussed in more detail later, noun phrases (NPs) in Chinese fall into three major formal categories in terms of how the pragmatic property of identifiability is encoded: definite, indefinite, and indeterminate (cf. Chen 2004). The property of semantic referentiality of some major types of Chinese NPs in the three categories, as well as Chinese partitive quantifiers, is summarized by Chen (2009:1160) in Table 30.1, basically on the same theoretical assumptions as in Fodor and Sag (1982).

As in English, semantic referentiality is not distinctively marked in Chinese. Other than some “inherently” referential or nonreferential encodings, such as proper names and pronouns, Chinese NPs in other formal categories may be semantically referential or nonreferential, as shown in Table 30.1.

30.1.3 Pragmatic Referentiality

While semantic referentiality is mainly concerned with user-independent, decontextualized meaning of expressions that is marked by the grammatical and lexical encoding of expressions, pragmatic referentiality relates mainly to the use of linguistic expressions in a given context.

Pragmatic referentiality comprises three components: (i) presupposed existence of an individual entity in the universe of discourse established between the speaker and the addressee, (ii) Of specific reference to the speaker, (iii) with speaker’s intention to use the expression to refer to the specific entity in question. It is essentially a context-dependent and speaker-oriented concept. Whether the entity in question is one of specific reference to the speaker depends on the familiarity of the speaker about the referent in the context, with little regard for the cognitive status of the referent in the mind of addressees beyond the presupposed existence. More important, it depends crucially on the intention of the

speaker to use the expression to refer in the particular context. For an expression to be pragmatically referential, it has to fulfill all the three conditions, whereas a nonreferential expression is one that fails to fulfill one or more of them.

There is no special linguistic device that systematically and consistently marks an expression as pragmatically referential or nonreferential in Chinese, or in English for that matter, as discussed in Chen (2009). Of the Chinese expressions in various encodings presented in Table 30.1, the most common form used for nonreferential entities is bare NP. As observed in Lü (1944) and Chen (2003), the more nonreferential an NP is, the more likely is it to drop the indefinite marker *yi* and the classifier (CL) and assume the form of bare NP. The preference for bare NP for nonreferential uses is not difficult to explain. Bare NP and non-bare NP in Chinese differ most prominently in that nouns in the latter group are typically preceded by a classifier. The major function of classifiers in languages characterized by this grammatical feature, as extensively discussed in the literature, is to individuate entities. As the most prototypical nonreferential expressions do not presuppose the existence of an entity denoted by the expression, they have no need for an encoding device that marks the individuation of an entity or other markers that characterize features accompanying individuated entities such as numeration. The fit in form and function between bare NP and nonreferentiality makes the former the encoding type par excellence for the latter in Chinese.

Table 30.1 Semantic referentiality of grammatical categories of Chinese names phrases

| | Semantic Referential | Semantic Nonreferential |
|---|----------------------|-------------------------|
| Definite | | |
| Proper NP | + | - |
| Personal pronoun | + | - |
| Demonstrative <i>zhe/na</i> 'this/that' | + | - |
| <i>zhe/na</i> 'this/that' + NP | + | - |
| Indefinite | | |
| <i>yi</i> 'one' + (CL) + NP | + | + |
| CL + NP | | |
| Indeterminate | | |
| Numeral/ <i>ji</i> 'several'... + CL + NP | + | + |
| Bare NP | + | + |
| Partitive Quantifier | | |
| <i>mei</i> 'each', 'every' | - | + |
| <i>suoyou</i> 'all' | - | + |
| <i>yiqie</i> 'all' | - | + |
| <i>daduoshu</i> 'majority', 'most' | - | + |
| <i>duoshu</i> 'most' | - | + |
| <i>shaoshu</i> 'few' | - | + |

Note: NP = noun phrase; CL = classifier.

30.1.4 Discourse Thematic Referentiality

Discourse thematic referentiality relates to the importance of the entity in the thematic organization of the discourse. A thematically nonreferential NP stands for an entity that is taken by the speaker as of no or little importance in discourse, and a thematically referential NP is one that stands for an entity of relatively higher importance.

Some referents play an important role in the development of the discourse, some only play a secondary role in the process, and some may be just mentioned in passing by the speaker, serving as the prop for the scene or providing background information to the referents in the foreground. From the perspective of thematic progression in discourse, an NP in referential use is first and foremost one that indicates a clearly delineated, bound entity with continuous identity over time, which, due to this continuous identity over time, is available for further tracking after it is introduced into the universe of discourse. Referentiality, from this perspective, "is not so much of a speaker having a referent in mind at the time of the utterance, as of a speaker assessing the relative discourse significance of an entity and presenting to hearers in such a way as to successfully foreground it" (Hopper and Thompson 1993:360). Instead of activating or referring back to an independent mental file, a discourse thematic nonreferential NP, according to Du Bois (1980) and Thompson (1997), typically plays a nontracking role in discourse, serving one of three major functions of classifying, predicating, and orienting or backgrounding.

Languages may be sensitive to distinction in discourse thematicity. There are morphosyntactic devices whose primary function is to mark degrees of thematic importance registered by discourse entities in the context of use. A well-known example is *this* in English in its relatively recent use as an indefinite determiner to introduce into discourse referents of thematic importance. Grammatical constructions have also been found to differ significantly in terms of the discourse thematicity of the NPs that occur in them. Hopper and Thompson (1993:365–364), for instance, report that in a study based on text counts, 97% of English subject NPs in their data are discourse manipulable, whereas 65% of object NPs are discourse nonreferential.

Similar linguistic devices have been attested in Chinese. Sun (1988), for instance, reports that 80% of the major participants in Chinese are introduced by means of numeral-classified constructions in spoken narratives. Wright and Givón (1987:15) also find that the grammatical contrast between the *yi*+CL+NP construction and bare NP in introducing indefinite nouns for the first time into discourse in Chinese codes the pragmatics of importance, with the former marking entities of pragmatic importance and the latter entities of minor or no importance in discourse.

Chen (2009) examines the discourse thematic referentiality of two groups of NPs in Chinese, one in the form of an indefinite NP in the *yi*+CL+NP construction and the other in the form of bare NP, in connection with some other major grammatical constructions in order to establish whether, and if so how, discourse thematicity is systematically encoded in Chinese. It is found that whereas bare NP can be characterized as a

marker of thematic nonreferentiality or low thematicity in Chinese, the indefinite NP in the form of *yi*+CI+NP, in and of itself, is a much less consistent marker of thematicity. It may encode an entity of low thematic importance just as likely as an entity of high thematic importance. In addition to the contrast between encoding devices such as numeral-classified NPs and bare NPs in Chinese, other grammatical constructions have also been found to differ significantly in terms of the discourse thematicity of the NPs that occur in them. Irrespective of whether or not they are of specific and identifiable reference, the NPs in the locative construction are predominantly encoded as bare NP, the form par excellence for both semantically/pragmatically nonreferential entities and thematically nonreferential entities. In contrast, the effect of the subject position and the *you* presentative construction that are traditionally taken as canonical devices to introduce entities of thematic importance is overridden by the grammatical encoding of bare NP as a marker of low thematicity, with 67% and 79% of the referents in the form of bare NP introduced in the subject position and in the *you* construction, respectively, being thematically nonreferential.

30.2 DEFINITENESS

The term "definiteness" denotes a grammatical category featuring formal distinction whose core function is to mark a nominal expression as identifiable or nonidentifiable. Identifiability is taken as an addressee-oriented, pragmatic notion relating to the assumptions made by the speaker on the cognitive status of a referent in the mind of the addressee in the context of utterance. A referent is considered to be identifiable if the speaker assumes that the addressee, by means of the linguistic encoding of the NP and in the particular universe of discourse, is able to identify the particular entity in question among other entities of the same or different class in the context. Otherwise it is considered to be nonidentifiable.

The formal distinction in terms of definiteness may be expressed by a variety of grammatical means in languages, including phonological, lexical, morphological, and word order. Most typically, the grammatical category is encoded in terms of a contrast between a definite article like *the* and an indefinite article like *a* in English. A definite expression with *the* differs essentially from an indefinite expression with *a* in that the former is marked as being identifiable and the latter as nonidentifiable. Whether or not a language is considered to have a grammatical category of definiteness is decided, to a large extent, on the basis of whether there are specialized grammatical means primarily for this particular function on a par with definite and indefinite articles in languages like English. As observed by Chesterman (1991:4), "it is via the articles that definiteness is quintessentially realized, and it is in analyses of the articles that the descriptive problems are most clearly manifested. Moreover, it is largely on the basis of the evidence of articles in article-languages that definiteness has been proposed at all as a category in other languages."

Three major types of linguistic devices—lexical, morphological, and positional—are employed in Chinese to indicate or suggest to the addressee whether the nominal expressions should be interpreted as being of identifiable or nonidentifiable reference.

30.2.1 Lexical and Morphological

In terms of lexical encoding, aside from proper names and personal pronouns, three major groups of definite determiners serve the function of marking a referent as identifiable in Chinese: demonstratives, possessives, and universal quantifiers. Monosyllabic classifiers in Chinese, and occasionally monosyllabic nouns as well, may undergo the morphological process of reduplication to gain the same meaning as that of distributive universal quantifiers. There is no *the*-like definite article in Chinese. Of the major definite determiners in Chinese, demonstratives are developing functions, more advanced in spoken Chinese than in written Chinese, which are served by the definite article in English in marking referents whose identifiability is established through shared general knowledge, and in anaphoric and associative uses, although they have still preserved their deictic force to a considerable extent in these situations. All definite articles in languages evolved from demonstratives through the process of grammaticalization. To the extent that the Chinese demonstratives have retained their deictic force, they don't always behave in the same way as fully grammaticalized markers of definiteness like the English *the* and thus cannot be treated on a par with a fully developed definite article.

The most important indefinite determiner in Chinese is *yi* + classifier. *Yi* on its own is a numeral and can still be used in the same way as all the other numerals in Chinese. Unlike the other numerals, however, *yi* + classifier has undergone the process of grammaticalization toward a marker of indefiniteness in much the same way as the English indefinite article was derived from the numeral 'one'. Other than the fact that *yi* + classifier can be used both as a pronominal and as a determiner, it serves all the major functions of a regular indefinite article as the English *a* and moreover extends to other uses that have not been reported for indefinite determiners in English or other languages (cf. Chen 2003, 2004).

NPs that are lexically or morphologically encoded as definite or indefinite, on the assumption that they are used referentially, are always interpreted as of either identifiable or nonidentifiable reference in utterance, no matter what position they occupy in sentences. The encodings are determinate in relation to the interpretation of identifiability.

There are other types of NPs that, so far as their lexical or morphological encodings are concerned, are neutral with respect to the interpretation of identifiability: the bare NP and the cardinality expression, which is an NP modified by a cardinal numeral or a quantifier like *ji* 'several'. They constitute what I call the indeterminate encodings of NP with respect to the interpretation of identifiability. In most but not all instances, whether the indeterminate expressions are to be interpreted as identifiable or nonidentifiable is indicated, or suggested, by the position of the NP in sentences.

30.2.2 Positional

Syntactic positions in sentences may display strong inclination in terms of interpretation of the NP in the slot as referentially identifiable or nonidentifiable. It has been a well-known fact in studies of Chinese grammar that a bare noun in subject position, like *keren* 'guest' in the subject position in *keren lai le* 'the guest(s) has/have come', is normally interpreted as identifiable and the same word in the postverbal position, as in *lai keren le* 'here come(s) guests/a guest, nonidentifiable. Relevant positions in Chinese sentences fall into two categories, definiteness inclined and indefiniteness inclined, as presented in Table 30.2.

Nominal expressions that are lexically or morphologically encoded as definite or indefinite may be subject to restrictions in their eligibility to occur in some of the positions shown in Table 30.2. It is ungrammatical, for example, to have a reduplicated classifier or noun in any of the indefiniteness-inclined positions, as exemplified by (1):

- (1) *You ren ren lai guo zher
 have person person come EXPERIMENTAL ASPECT here
 'Everybody has been here.'

Indefinite expressions can hardly occur as subject with stative predicate, as illustrated by (2):

- (2) *Yi ge ren hen congming
 one CL person very smart
 'one person is very smart.'

In the great majority of cases, the inclination is manifested not in terms of grammatical restriction but in terms of higher frequency of expressions of one category in contrast with the other in texts. As amply demonstrated in statistical studies of Chinese sentences and discourse, NPs in subject, *ba* object, and the other definiteness-inclined positions are overwhelmingly definite, and those in indefiniteness-inclined positions

Table 30.2 Definiteness- and indefiniteness-inclined positions in Chinese

| Definiteness-inclined | Indefiniteness-inclined |
|---------------------------------------|--|
| Subject | Object of the presentative verb <i>you</i> |
| <i>ba</i> object | Postverbal NP in presentative sentences |
| Preverbal object | Postverbal NP in existential sentences |
| First object of ditransitive sentence | Second object of ditransitive sentences |

Note: NP = noun phrase.

are overwhelmingly indefinite. Similar findings are reported in other languages as well (cf. Givón 1984/1990).

Expressions that are lexically and morphologically indeterminate with regard to identifiability are not subject to the same kind of restrictions as expressions of determinate encodings. Generally speaking, they occur freely in positions of either inclination, as well as in other positions. At the same time, they display a strong inclination to be interpreted as identifiable in definiteness-inclined positions and as nonidentifiable in indefiniteness-inclined positions. The strength of the inclination varies with the types of indeterminate encoding and the sentential positions that are occupied by the expressions. There is, however, no absolute correlation between the interpretation in respect of identifiability of reference and the inclination of the position occupied by indeterminate expressions in sentences. Sometimes the same NP in indeterminate encoding may have different interpretations in the same sentential position. Consider (3) and (4):

- (3) Liang ge qiangdao cong zheli zou guo, kandao zhouwei
 two CL bandit from here walk by see around
 meiyou ren, zhiyou Ou Ji zhome yi ge xiaohaizi,
 have-not person only Ou Ji this one CL kid
 jiu qi le huaxin..... Liang ge qiangdao
 then arise PERSPECTIVE ASPECT evil:idea two CL bandit
 ba Ou Ji de shuangshou fan bang zhu
 BA Ou Ji DE two:hand back tie up
 'Two bandits passed by; saw nobody around except the kid Ou Ji,
 and then had an evil idea..... The two bandits tied Ou Ji's hands
 behind his back.'

The cardinality expression *liang ge qiangdao* 'two bandits' in the two clauses has exactly the same lexical encoding and occupies the same syntactic position; it is nonidentifiable on the first occurrence and identifiable on the second.

- (4) Zuowan lianyouchang da huo, tie men dou shao hua le.
 last:night refinery big fire iron gate even burn melt CURRENTLY
 RELEVANT STATE
 'There was a big fire at the refinery last night. The/an iron gate/gates
 melted in the fire.'

The bare noun *tie men* 'iron gate' in (4) can refer to an identifiable referent, in the situation where there is only one iron gate at the refinery that is supposed to be known to the addressee as part of their shared background knowledge or as a frame triggered entry. The sentence is also appropriate in the context in which the addressee is not assumed

to know, and probably the speaker himself does not know either, how many iron gates there were to the refinery and which one or ones were melted in the fire. All that the speaker intends to tell the addressee is that the fire was so destructive that it melted one or more iron gates. In the latter case, the expression obviously refers to a nonidentifiable referent.

In conclusion, there is no simple, fully grammaticalized marker of definiteness in Chinese like the definite article in English. In spite of the fact that demonstratives in Chinese have developed some uses that are normally served by definite articles in other languages, their basic or primary functions are still far from being those of deictically neutral determiners of definiteness like English *the*. While the Chinese numeral *yi* has arguably reached the endpoint of grammaticalization into an indefinite article, there is no paradigmatic contrast between it and a highly grammaticalized marker of definiteness. Furthermore, it is not obligatory to mark a nominal expression as either definite or indefinite in Chinese, as is the case in English. To the extent that situations are abundant in Chinese in which the interpretation of bare NPs and cardinality expressions with respect to identifiability cannot be determined solely in terms of their position in sentences, and may even be ambiguous or indeterminate with regard to identifiability, the features of definiteness and indefiniteness cannot be uniquely and unambiguously specified for nominal expressions in Chinese. This leads to the conclusion that definiteness as a grammatical category has not been fully developed in Chinese.

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CHAPTER 31

ADVERBS

YUNG-O BIQ

31.1 OVERVIEW

31.1.1 Clausal Positioning and Semantic Orientation

Chinese adverbs can occur in two positions in a clause: internally (i.e., between the subject and the predicate) and externally (i.e., at the clause-initial position). Generally speaking, these two linear positions are respectively associated with the two types of semantic orientation of adverbs, that is, predicate-oriented for the internal position and clause-oriented for the external position (cf. Cinque 1999). This makes sense, since predicate-oriented adverbs provide details about the action/state that the predicate denotes (e.g., when and how the action is carried out, to what extent the state holds, or whether the action/state is true). On the other hand, clause-oriented adverbs indicate factors concerning how the proposition content of the clause matches with the context or the world, for example, in which possible situation the proposition conveyed by the clause can be true or whether the content of that proposition is deemed good or bad.

However, the association between the linear positioning and the semantic orientation of adverbs is not absolute; rather it is a schematic tendency. Some predicate-oriented adverbs (especially disyllabic ones) can appear at the external position, and some clause-oriented adverbs (especially monosyllabic ones) occur only at the internal position.

- (1) a. Ganggang Wang Xiansheng da dianhua lai zhao ni.
just-now Wang mister call phone come look-for 2S
'Mr. Wang called just now to look for you.'
b. Wo pian bu qu!
1S contrary-to-expectation NEG go
'(Contrary to your expectation), I simply won't go!'

31.1.2 Relative Positioning of Adverbs

When two or more adverbs occur in a sequence, the relative ordering often alters the interpretation of the clause. A rule of thumb is that the ones on the left have a scope over the ones on the right. This is best illustrated when negation adverbs are involved.

- (2) a. Ta dui ren tai bu youshan le.
3S to people too NEG friendly PRT
'He is extremely unfriendly to people.'
b. Ta dui ren bu tai youshan.
3S to people NEG too friendly
'He is not very friendly to people.'

31.1.3 Types of Head Modified by Adverbs

Adverbs in Chinese characteristically modify verbs and adjectives or the entire clause.

For example:

- (3) a. Wo yongyuan ai ni.
1S forever love 2S
'I love you forever.'
b. Ta hen gao.
3S very tall
'He is very tall.'
c. Xingkuai tamen zhidao wo shi nide xuesheng.
fortunately 3P know 1S be your student
'Fortunately they knew I was your student.'

Adverbs cannot be an attributive modifier within a nominal. However, many can modify some types of noun phrases when they serve as the predicate of a clause (e.g., those indicating time or quantity).

- (4) a. Xianzai yijing xiattian le.
now already summer PRT
'It's already summer now.'
b. Tamen yigong sange ren.
3P altogether three-CL person
'There are altogether three of them.'

However, by no means can all adverbs occur with all of the heads mentioned previously. For example, *tai*, a degree adverb meaning 'excessively', cannot modify a clause.

Adverbs typically cannot occur alone, yet a small number can do so in answering questions (e.g., *yiding* 'certainly', *yeixu* 'perhaps', *mashang* 'immediately').

31.1.4 The Adverb Affix *-de*

Monosyllabic adverbs do not take the adverb affix *-de*. Some disyllabic adverbs take *-de* as an option (e.g., *jianjiande* 'gradually', *yongyuande* 'forever'), while some others do not (e.g., *pianpian* 'unexpectedly' [contrary to expectation], *jingran* 'surprisingly'). However, there does not seem to be any functional difference with or without the *-de* option when it is available. For example, *jianjian* 'gradually' and *jianjiande* 'gradually' mean practically the same thing.

31.1.5 Reduplication, Quasi-affixation, and Syllabic Restriction

Many disyllabic adverbs are derived from the reduplication of monosyllabic adverbs. While the two forms have practically the same meaning (e.g., *chang/changchang* 'often', *gang/ganggang* 'just now', *pian/pianpian* 'unexpectedly' [contrary to one's expectation]), the monosyllabic form can appear only at the internal position; the reduplicated form can also appear at the external position. Some other disyllabic adverbs are derived from monosyllabic adjectives with a reduplication of the syllable. The reduplicated form can be used as an adverb only, not as an adjective.

- (5) a. *Xianzai hai zao*.
now still early
'It's still early now.'
b. *Ta zaozao(de) lai le*.
3S early early DE come PRT
'He showed up early.'
c. **Xianzai hai zaozao*.
now still early early

Some monosyllabic adverbs (X) also have an "X-*shi*" counterpart, in which the Chinese copula, *shi* 'be', is read with reduced stress as a quasi-affix (Dong 2004). The X form and the X-*shi* form share essentially the same meaning (e.g., *zong/zongshi* 'always', *lao/laoshi* 'always'). Some disyllabic adjectives can also go through the X-*shi* formation, and the new trisyllabic form is used only as an adverb (e.g., *xiantan* 'apparent' vs. *xiantanshi* 'apparently').

A small number of monosyllabic adverbs are used mainly in written language and always accompany a monosyllabic predicate that they are modifying (Feng 2010). For example, *shen* 'quite' prefers to be followed by a monosyllabic adjective predicate (6a) rather than a disyllabic one (6b). By contrast, some disyllabic adverbs traditionally deemed remnants from Classical Chinese prefer disyllabic predicates to follow them (7a) rather than monosyllabic ones (7b). However, the majority of adverbs, monosyllabic or disyllabic, do not show this syllable restriction.

- (6) a. *shen hao*.
quite good
'quite good'
b. ?*shen lianghao*.
quite good
(7) a. *jueding youliang*.
supremely good
'supremely good.'
b. ?*jueding hao*.
supremely good

31.1.6 Adverbs and Adjectives in Chinese

In a large number of cases, adverbs and adjectives are morphologically identical. However, adverbs can occur in an adverbial phrase only, while adjectives in Chinese can occur not only in adverbial phrases but also in adjectival phrases, predicate, and complement. For example, *duo* 'a lot' can be used as an adverb modifying a verb phrase (8a), but as an adjective it can be the predicate of a clause (8b).

- (8) a. *Ta duo shui le yige xiaoshi*.
3S extra sleep PRT one-CL hour
'He slept one extra hour.'
b. *Ren hen duo*.
person very many
'There are a lot of people.'

Some adjectives and adverbs, on the other hand, form homophonous pairs with the same pronunciation but a different meaning. For example, *lao* 'old' in *lao(de) ge* 'old song' is an adjective (or adjectival morpheme), while *lao* 'always' in *lao chidao* 'always late' is an adverb.

31.2 A SURVEY OF TYPES OF ADVERBS

In this section, Chinese adverbs are divided into several groups for discussion. We adhere to our definition of adverbs provided earlier and focus strictly on words that are only adverbs but not adjectives at the same time, although adjectives are often used in adverbial phrases, especially for describing the manner/means in/with which an action is carried out or a state holds. Following the tradition in Chinese linguistics, we discuss temporal, degree, negation, scope, and stance adverbs. While this grouping offers a framework that is meant to distinguish all major types of adverbs in Chinese, it is possible, and often happens, that individual adverbs can be grouped into more than one type. It is also necessary to point out that many Chinese adverbs can be a connective in clause combining. This point is not pursued further in this chapter until it becomes relevant to the discussion in Section 31.3 about individual adverbs.

31.2.1 Temporal Adverbs

Temporal adverbs convey meaning about facets of time, an element indispensable in talking about actions and states. Some temporal adverbs are about contrasts between time points (e.g., *gang* 'just [how]' and *like* 'immediately'); some are about aspectuality (e.g., *ceyijing* 'once, used to', *yijing* 'already'); some are about duration (e.g., *zhanqie* 'temporarily', *yongyuan* 'forever'); and some are about frequency (e.g., *chang* 'often, over 'occasionally'). Temporal adverbs are predicate-oriented adverbs, so they prefer the internal position, but, as stated earlier, some disyllabic ones may appear in the external position (e.g., *ouer* 'occasionally').

31.2.2 Degree Adverbs

Degree adverbs are distributed over a scale of degree, which ranges from low degree (e.g., *shaowei* 'a little bit'), to high degree (e.g., *hen* 'very', *feichang* 'very'), and to excessive degree (e.g., *tai* 'too much/excessively'). Adverbs used in comparison (e.g., *hai* 'still more' and *geng* 'even more') also belong to this group.

Degree adverbs typically modify adjectives. They can also modify some mental verbs (e.g., *shifen shengqi* 'very mad', and *hen xihuan* 'like very much'). However, degree adverbs may also modify lexical items that would normally be considered nouns. When such use occurs with a common noun, it is the quality the noun bears that is drawn out, for example, *shifen guanliao* 'quite bureaucratic' where *guanliao* is 'bureaucracy', *tai wenxue* 'too literary' where *wenxue* is 'literature', and *hen niang* 'very sassy' where *niang* is the archaic term for 'mother'. Degree adverbs can also work with a proper name if it is strongly associated with certain qualities or features that are socially or culturally

meaningful, for example, *hen muonei* 'very Monet-like' where *muonei* is the Chinese name of the famed artist.

31.2.3 Negation Adverbs

The two most important negators in Chinese, *bu* 'not' and *mei* 'not', are traditionally considered adverbs. When it comes to negation, the first issue is scope. The scope of negation adverbs refers to the part of meaning in a clause that is being negated. Structurally, negation adverbs precede their scope, which is typically verbs or adjectives (e.g., *bu qu* 'not go, *mei qu* 'I did' not go, *bu re* 'not hot'). When negation adverbs appear with other types of adverb, the relative word order indicates their relative scope: those to the left have a wider scope than those to the right. Recall the *tai bu* versus *bu tai* contrast in Section 31.1.2.

Bu generally indicates a stative (9a) or generic/habitual reading (9b).

(9) a. Ta bu change.

3S NEG sing PRT

'He stopped (being in the state of) singing.'

b. Ta bu chi niurou.

3S NEG eat beef

'He doesn't eat beef.'

Mei(you) generally indicates an eventive reading: the event did not occur (10a), or the event has not been completed (10b). However, the event can be one that is in the future (10c).

(10) a. Ta mei(you) kan shu.

3S NEG read book

'He did not read/study.'

b. Ta mei(you) kanwan na ben shu.

3S NEG read-finish that CL book

'He didn't finish reading that book.'

c. Mingtian ta yinggai hai mei(you) kanwan na ben shu.

tomorrow 3S should still NEG read-finish that CL book

'It should be the case that by tomorrow he has not yet finished reading that book.'

Mei(you) can also negate some stative predicates and indicate the lack of a change of state.

(11) Shuiguo mei huai.

fruit NEG rotten

'The fruit is not (in the state of being) rotten; the fruit did not become rotten.'

31.2.4 Scope Adverbs

Scope adverbs indicate the scope within which the predicate applies. Subtypes of scope adverbs include those referring to universal coverage (e.g. *dou* 'all', *quan* 'all', and *yigong* 'altogether'), those referring to minimum coverage (e.g. *zhi* 'only', *cai* 'only', and *guang* 'just, alone'), and those referring to approximate coverage (e.g. *dagai* 'about, approximately', and *dayue* 'about, approximately'). Within the approximate subtype, there are further groupings, such as those indicating small quantity (e.g. *buguo* 'just, *zuiduo* 'the most') and those indicating large quantity (e.g. *zhishao* 'at least', *zuzu* 'no less than').

Quite often, a sentence containing a scope adverb may be ambiguous if read without context. For example:

- (12) *Wo zhi you yizhang chuang.*
1S only have one-CL bed

'(1) I've got only ONE bed.'
'(2) I've got only one BED.'

The scope of *zhi* is the verbal predicate, *you yizhang chuang* 'have one bed'. However, the focus of the scope may shift and the interpretation of the clause may differ. One possible reading is 'I have only one bed and no more', with the focus on the number, *yi* 'one'. The other possible reading is 'I have only got a bed but no more other furniture', with the focus on the object, *chuang* 'bed'. Context usually provides a guide to what the scopal focus is.

When it comes to minimum coverage, there are two restrictive types: upper bound (like the English *only*) and lower bound (like the English *alone*; cf. discussion in Huddleston and Pullum 2002, section 6.7.3.1). For example:

- (13) *Ta zhi chi zhurou.*
3S only eat pork
'He only eats pork.'

Here *zhi* sets up the upper limit on the set of types of food he eats, in this case, a limit of one type—pork. So the sentence means he eats pork and no more (than pork).

On the other hand, the lower bound restrictive adverb sets up a lower limit. For example:

- (14) *Guang Zhongguo jiu bi Ou Zhou chuchan duo san bei.*
only China then compare Europe produce more 3-times
'China alone has three times more production than Europe.'

Here *guang* (with the help of *jiu* at the internal position) sets up China as the lower limit for the set of "countries/areas" that exceeds Europe in production. It is not that one

cannot add more to this set besides China; it is that one does not need to. China alone is sufficient to satisfy the requirement (of exceeding Europe in production).

Scope adverbs can also be distinguished in terms of whether the scopal focus precedes or follows the adverb. Those with the focus on the preceding position include *dou* 'all', *quan* 'all', and *tongtong* 'all'; those with the focus on the following position include *yigong* 'altogether', *guang* 'just, alone', and *jinyin* 'only'. Some examples are as follows:

- (15) a. *Tade pengyou wo dou bu renshi.*
his friend 1S all NEG recognize
'I know none of his friends.'
b. *Wo yigong shuile ba xiaoshi.*
1S altogether sleep-ASP eight hour
'Altogether I slept for eight hours.'

Finally, the scopal focus may not be overtly expressed in the clause, as long as it is clear from the context. In the following example, the focus of *dou* is 'the things he bought', which is not specified in the clause but should be clear from the context:

- (16) *Ta tongtong maile.*
3S all buy PRT
'He bought (them) all.'

31.2.5 Stance Adverbs

Stance adverbs are adverbs that are used to indicate the speaker's stance about what he or she is saying. Therefore, stance adverbs can be seen as a type of scope adverb that has its scope over the entire clause. The clause-oriented type of adverbs discussed in Section 31.1 are basically stance adverbs, although as mentioned earlier not all stance adverbs always occur at the external, clause-initial position.

Stance adverbs can be further distinguished into two subgroups: affective adverbs and epistemic adverbs. Affective adverbs express the speaker's attitude or evaluation toward what is being said. Typical examples are *xingkuai* 'fortunately', *piannian* 'unexpectedly' (contrary to what is expected), and *nandao* '(used in rhetorical question) is it the case that...? Epistemic adverbs express the extent to which a speaker commits him or herself to what he or she is saying. Examples are *yexu* 'perhaps' for uncertainty, *yiding* 'definitely' for certainty.

As stated earlier, while monosyllabic stance adverbs cannot occur at the external position, many disyllabic ones can occur at either the internal (17a) or the external position (17b).

- (17) a. Wo xingkui chi le zaofan.
 1S fortunately eat ASP breakfast
 'Fortunately I had my breakfast.'
 b. Xingkui wo chi le zaofan.
 fortunately 1S eat ASP breakfast
 'Fortunately I had my breakfast.'

When occurring in the internal position, stance adverbs usually precede other types of adverb since as clause-oriented adverbs they project a scope wider than those of other adverb types, which are mainly predicate-oriented.

The marking of the speaker's stance is important to the coherence of the discourse and the hearer's quick understanding of the speaker's perspective. The sentence in the following example is provided here with no context. With or without the stance adverb, *jiuran* 'out of one's expectation', the propositional content remains the same, that is, 'He forgot the number of the mailbox.' However, the use of the stance adverb indicates that, from the speaker's perspective, his forgetting of the number of the box is something worthy of note.

- (18) Ta juran wangle xinxiangde haoma
 3S out-of-one's-expectation forget-ASP mailbox-POSS number
 '(Out of one's expectation) he forgot the number of the mailbox.'

On the other hand, two or more stance adverbs of similar meaning may occur in a compound sentence or two consecutive clauses to highlight the speaker's attitude in a consistent way and thus render a smooth transition of ideas in the discourse. In the following example, both *dagai* 'probably' and *kongpa* '(I am) afraid that' are used, and both suggest the speaker's prediction/estimate of things to come with uncertainty.

- (19) Mingtian dagai yao xia da yu. Bangqiu bisai kongpa yao quxiao.
 tomorrow probably will rain big rain baseball contest afraid will cancel
 'There will probably be a big rain tomorrow. (I am) afraid that the baseball game will be cancelled.'

31.3 INDIVIDUAL ADVERBS

A handful of Chinese adverbs are used highly/frequently in speech and writing. Common characteristics of these high-frequency adverbs are that (i) they are monosyllabic; (ii) they can be used in clause combining, either alone, or paired up with other grammatical

words or constructions; and (iii) they can be cross-listed as predicate-oriented adverbs, contributing meaning to the propositional content of the sentence, or as clause-oriented adverbs, contributing meaning to how the sentence is interpreted in the speech context.

31.3.1 *Cai* and *Jiu*

Cai and *jiu* are primarily scope adverbs. They carry opposite conventional implicature in many contexts, but they can be synonymous in some other contexts. When talking about time, *cai* suggests that the asserted value (focus) is 'later than the expected time', while *jiu* suggests it is 'earlier than the expected time', where the expectation can be that of the person spoken of, the speaker him or herself, or the general assumption given the situation and the world.

- (20) a. Ta zuotian cai zou.
 3S yesterday CAI leave
 'He didn't leave until yesterday.'
 b. Ta zuotian jiu zou le.
 3S yesterday JIU leave PRT
 'He left (as early as) yesterday.'

When talking about quantity, *cai* suggests that the asserted value is 'more than expected' while *jiu*, 'less than expected':

- (21) a. Wu qian kuai qian cai neng mai yi dongfangzi.
 five thousand dollar CAI can buy one CL house
 'As much as \$5,000 is required for buying a house.'
 b. Wu qian kuai qian jiu neng mai yi dongfangzi.
 five thousand dollar JIU can buy one CL house
 '(As little as) \$5,000 is enough for buying a house.'

When talking about other subjects, *cai* and *jiu* still implicate a scale on which different values are lined up and compared to one another. The following examples illustrate a contrast between necessary condition, associated with *cai*, and sufficient condition, associated with *jiu*.

- (22) a. Ni qu wo cai qu.
 2S go 1S CAI go
 'I won't go unless you go. I go if and only if you go.'

- b. Ni qu wo jiu qu.
2S go 1S 3IU go
'I'll go if you go.'

However, *cai* and *jiu* can both mean 'only,' synonymous to *zhi* 'only,' when the asserted value appear in the following position. For example:

- (23) a. Ta cai chile yiwan fan.
3S CAI eat-ASP one-CL rice
'He only had one bowl of rice.'
b. Ta jiu chile yiwan fan.
3S 3IU eat-ASP one-CL rice
'He only had one bowl of rice.'

Cai and *jiu* can also express stance. *Cai* suggests a refutation of the hearer's assumption; *jiu* suggests an insistence of the speaker's intention. Both occur with negation often but not necessarily. Also, as stance adverbs, they occur with first-person subjects often, but again, not necessarily.

- (24) a. Wo cai bu qu!
1S CAI NEG go
'(Contrary to your expectation), I won't go!'
b. Wo cai lande guan tade shi ne!
1S CAI lazy-DE mind his affair PRT
'(lit.) I am too lazy to mind his business. -> (Contrary to your assumption), I don't give a damn what he's up to!'
c. Wo jiu bu qu!
1S 3IU NEG go
'(As I have insisted), I won't go!'
d. Wo jiu yao zheme zuo, zemeyang?
1S 3IU want this-way do how-about-it
'I just want to do it this way, so?'

31.3.2 You and Ye

You and *ye* are both additive scope adverbs with meanings similar to *also* and *too* in English. *You* indicates repetition of action or repetition/continuation of state.

- (25) a. Na ge nanren jintian you lai le.
that CL man today again come PRT
'That man showed up again today.'

- b. Wo zuijin you pang le.
1S recently again fat PRT
'I have gained weight again lately.'

Repetition further leads to juxtaposition of actions/states that may not seem "similar" but rather antonymous to, or in contrast with, each other. Here, *you* turns into an adverb that functions like a connective in the coordinate structure and is often used in pairs, "*you*... , *you*..." similar to 'not only... but also...' in English.

- (26) a. Haizimen chang ge you tiaowu, kuaile jile.
child-PL sing song also dance happy extremely
'The children sang and (also) danced, (and were) very happy.'
b. Tamen jianle mian, you ku you xiao.
3P see-ASP face also cry also laugh
'(When) they met, they cried and (also) laughed.'

The contrastive sense in the juxtaposition of two actions/states further gives rise to an affective sense, highlighting the contrast between the hearer's assumption and the speaker's stance. Again, the stance use of *you* often occurs with negation and the first-person subject.

- (27) A: Wo yinggai zeme ban?
1S should how-to-do
'What should I do?'
B: Wo you bu shi ni. Wo na zhidao?
1S YOU NEG be 2S 1S how know
'(But) I'm not you. How would I know?'

Ye, on the other hand, is also an additive scope adverb, but its focus is on the nominal subjects/objects that share the commonality of carrying out the action or holding the state denoted by the predicate.

- (27) a. Ta tiaowu, ta meimei ye tiaowu.
3S dance his sister also dance
'He dances; his sister also dances.'

- b. *Ta* lao le, *ta* taitai *ye* lao le.
 3S old PRT his wife also old PRT
 'He became old; his wife became old too.'

Next, clauses with different predicates that are considered similar or related in the context may be connected by *ye*, which functions more like a connective than an adverb here.

- (28) *Taiyang xia shan le, niao ye hui jia le.*
 sun go-down mountain PRT bird also return home PRT
 'The sun went down, and birds also returned home.'

On the other hand, as an additive scope adverb, *ye* can further suggest a scale when it pairs up with other connectives (or prepositions) and forms constructions like "*lian... ye... even...*" to refer to an unlikely member on that scale. Usually, the "*lian... ye...*" construction occurs with negation.

- (29) *Zhe jian shi lian ta ye bu zhidao.*
 this CL matter even 3S also NEG know
 'Even he did not know about this matter.'

Furthermore, *ye* can work with Chinese interrogative words to denote universal inclusiveness.

- (30) a. *Zhe jian shi shei ye bu zhidao.*
 This CL matter who(-ever) YE NEG know
 'No one knew this matter.'
 b. *Wo sheme ye mei chi.*
 I what YE NEG eat
 'I did not eat anything.'
 c. *Jinnian ta nar ye mei qu.*
 this-year 3S where YE NEG go
 'This year he did not travel (to any place).'

Finally, *ye* can also be a stance adverb suggesting that the speaker takes what he or she is saying as an extreme case (on some scale not linguistically expressed but contextually identifiable). The meaning of this stance use is quite far away from those of *also* or *too* in English but is closer to *even*. The use of *ye* conveys a sense of concession, thus renders

mitigation of the speaker's tone of voice. Negation often occurs with this use but not necessarily. The stance use can also function as a connective at the same time.

- (31) a. *Lin Bobo ye bashi le.*
 Lin uncle YE eighty PRT
 'Uncle Lin is (even/already) eighty years old.'
 b. *Suiran nimen de le guanjun, danshi ye bie gaoxing de tai zao!*
 although you-PL obtain ASP championship but YE NEG happy DE too early
 'Even though you've got the championship, don't get excited too soon!'

31.3.3 Dou

Dou is a scope adverb indicating universal inclusiveness.

- (32) a. *Tamen dou zou le.*
 3P all leave PRT
 'They're all gone.'
 b. *Tamen dou hen lei.*
 3P all very tired
 'They're all tired.'

Like *ye*, *dou* can occur with the connective *lian* to form the "*lian... dou... even...*" construction to indicate universal inclusion, including the member marked by *lian*, which is deemed an unlikely one (on some scale) to be included in the set that holds properties denoted by the predicate.

- (33) *Lian ta dou zhidao zhe jian shi.*
 even 3S all know this CL matter
 'Even he (the least likely person) knew about this matter.'

In like fashion, *dou* can also occur with Chinese interrogative words to indicate universal inclusion.

- (34) a. *Zhe jian shi, shei dou zhidao.*
 this CL matter who all know
 'Everyone knows about this matter.'

- b. Wo shenme dou gei le ta le.
 I_S what all give ASP 3_S PRT
 'I gave him/her everything.'
- c. Shijieshang nar dou you Zhongguo ren.
 world-on where all have Chinese people
 'There are Chinese people everywhere in the world.'
- Finally, *dou* can also be a stance adverb to indicate that the speaker deems what he or she is saying is an extreme/excessive/outstanding/extraordinary situation given the circumstances. In relating what's said in the clause to the speech situation, one can argue that *dou* is pragmatically a connective here too.
- (35) a. Ai! Ta jiao shenme mingzi, wo dou wangle.
 SIGH 3_S call what name I_S all forget PRT
 'Ai! I can't even remember his/her name. -> How come I've forgotten his/her name?'
- b. Kuai lai chi ba! Cai dou leng le.
 quick come eat PRT food all cold PRT
 'Come quick to eat! The dishes are (already to the extent of being) cold!'

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CHAPTER 32

THE GRAMMATICALIZATION OF THE BA CONSTRUCTION

Cause and Effect in a Case of Specialization

CHAOFEN SUN

32.1 INTRODUCTION

The BA construction (Lü 1948) in Standard Modern Chinese, also known as the dispositional construction (Wang 1943) in China, is perhaps the most well-known construction in Chinese linguistics for its special distributional properties and association with the syntactic object. The examples in (1) show that a syntactic object, as well as a semantically affected entity, such as *jiu* 'wine' can take either a postverbal position (1a) or a preverbal position (1b) marked by *ba*. In light of the lack of any marking of the postverbal object, it is hypothesized that there is no postverbal object marker in Chinese. So is *ba* a preverbal object marker? The example in (1c) shows that the affected entity *jiu* in preverbal position is perfectly good without *ba*, demonstrating that there is not a necessary preverbal object marker either.

- (1) a. *ta he -le jiu le*
 3rd drink PER wine CRS¹
 'He has drunk wine.'
- b. *ta ba jiu he le*
 3rd BA wine drink CRS
 'He has drunk wine.'
- c. *ta jiu he le*
 3rd wine drink CRS
 'As to the wine, he has drunk it.'

The data in (1), therefore, contradict Li and Thompson's (1974) claim that, in the course of a general word order shift from VO to OV in the 9th century, the Chinese verb *ba* was grammaticalized into a preposition-like object marker. As a matter of fact, both synchronic (Sun and Givón 1985) and diachronic (Sun 1997) studies found the hypothesized word order change in Chinese highly problematic, as the verb-final sequence makes up less than 10% in both spoken and written texts in Modern Chinese. The BA construction appears to be specialized and not generalizable to the syntactic system as a whole (Sun and Traugott 2011).

Pertaining to the issue of temporal boundedness noted by Szeto (1988) and Liu (1997), the data in (2) show that temporal boundedness for the BA construction is only a necessary condition but not a sufficient condition. Although the example in (2a) reveals that without the sentence-final *le* indicating perfect aspect, or currently relevant state, a BA sentence is not acceptable, the temporally bounded sentence in (2d) is still ungrammatical. The Chinese sentence meaning *The orchestra has played the Blue Danube* in (2c) entails a temporally bounded situation in which there must be an inherent starting point and an end point. The sentence in (2b) with a BA construction actually places a predicate focus, as was defined by Lambrecht (1994), on a resultant state. That is, the sentence in (2d) is ungrammatical because of a lack of linguistic sign that would suggest a resulting state. Therefore, the fundamental function of the BA construction is specialized to signal a predicate focus on a certain resultant state that is not generalizable by a syntactic object marker.

- (2) a. **ta ba jiu he*
he BA wine drink
b. *yuedui ba lanse duonaohé yanzou le*
music team BA blue-color Danube play CRS
'The orchestra has played the Blue Danube.'
c. *yuedui yanzou lanse duonaohé*
music team play blue-color Danube
'The orchestra played the Blue Danube.'
d. **yuedui ba lanse duonaohé yanzou*
music team BA blue-color Danube play

Many linguists have noted that resultative verb complements (RVC; Li and Thompson 1981) are the most common type of predicates in the BA construction. Among the predicates that commonly occur in the BA construction, observed by Zhang (2000), RVCs like *kan-wan* 'finish reading', *xi-de-ganjing* 'wash till clean', *na qu* 'take away', *na dao* 'take to (a place)', *kan-zuo shi* 'regard something to be' in (3) actually make up over 70% of the predicates in the modern Chinese BA sentences (see Section 32.3).

- (3) a. *ba shu kan-wan*
BA book look-finish
'to finish reading the book'
b. *ba yifu xi-de-ganjing*
BA clothes wash-de-clean
'to wash the clothes till (they are) clean'
c. *ba shu na qu*
BA book take go
'to take the book away'
d. *ba yifu na dao lou-shang qu*
BA clothes take arrive building-up go
'to take the clothes to upstairs'
e. *ba shu kan-zuo shi baobei*
BA book look-regard be treasure-treasure
'to take the books as treasure'

Section 32.2 presents the so-called YI construction and its clause reduction in Middle Chinese. Section 32.3 describes how the information structure and the grammaticalization of the verbal *ba* in Early Modern Chinese (EMC) interacted in forging the Chinese BA construction with RVCs as its main predicate. Section 32.4 concludes the chapter.

32.2 THE YI CONSTRUCTION AND CHANGES IN MIDDLE CHINESE

It has been observed (Zhu 1957; Bennett 1981) that the Old Chinese (7th century BCE to 2nd century CE) predecessor of the BA construction was the YI construction. The sentence in (4) is an instance of a biclausal serial verb structure, in which the verb *yi* is used as the main verb of the sentence, and the two verb phrases are separable by an adverb *bi* 'necessarily', even though the initial clause is subordinating an adverbial of time.

- (4) 大匠 诲人 必以 规矩 (孟子: 告子上)
da jiang hui ren bi yi gui ju
big master teach people necessarily use principle
'A great master always uses principles when teaching people.'

However, Cao and Long (2005) observe that the verb *yi* 以, originally meaning 'to take/carry/use' in Oracle inscriptions (before 7th century BCE), had changed into a grammatical marker in Old Chinese signaling an instrumental case (5a and 5c) or a theme (5b and 5d). However, the YIs in all these sentences were still ambiguous between possible verbal meaning in a biclausal structure (i) and a possible prepositional reading in a monoclausal structure (ii).

(5) a. 文王以民力为台 (孟子: 梁惠王上)

wen wang yi min li wei tai

Wen king YI people power be platform

- i. 'King Wen uses the power of the people to be his platform.'
 ii. 'King Wen built his platform with the power of the people.'

b. 尧以天下与舜 (孟子: 万章上)

yao yi tianxia yu shun

Yao YI world give Shun

- i. 'Yao took the world and gave to Shun.'
 ii. 'Yao gave Shun the world.'

c. 故以羊易之 (孟子: 梁惠王上)

gu yi yang yi zhi

thus YI sheep trade 3rd

- i. 'therefore, (he) used a sheep to trade it'
 ii. 'therefore, (he) traded it with a sheep'

d. 以弟子一人投河中 (史记: 滑稽列传)

yi di zi yi ren tou he zhong

YI disciple one person throw river middle

- i. '(he) took a student and threw (him) into the river'
 ii. '(he) threw a student into the river'

Wei (1977) observes that a monoclausal structure, in which *yi* only functions to mark an instrumental, or an affected, case, came into being in Middle Chinese (2nd to 10th century CE). Moreover, Cao and Long (2005) note that the occurrences of YI construction increased from 13% of all the serial verb constructions to 31% in Middle Chinese and identify that other than *yi* verbs with a similar "take" meaning such as *qu*, *chi*, *jiang*, *zhuo*, and *ba* in (6) commonly occurred in this serial verb construction in late Old Chinese and Middle Chinese. This is taken to be a process of expansion proposed by Himmelmann (2004) characteristic of grammaticalization.

(6) a. 取一大海水浇灌其身 (增壹阿含经48)

qu yi dahai shui jiaoguan qi shen

take one ocean water pour GEN. body

'to take one (bucket) of ocean water to pour over his body'

b. 反持小道人佛道中 (道行般若经: 卷下)

fan chi xiao dao ru fo dao zhong

contrary take small doctrine enter Buddhist way middle

'In reverse, (one) took a small doctrine and entered into the Buddhist doctrine.'

c. 我今可將此与彼沙门 (增壹阿含经41)

wo jin ke jiang ci yu bi shamen

1st now may take this give that monk

'I may now take this and give it to the monk.'

d. 捉手牵之 (摩诃僧祇律22)

zhuo shou qian zhi

take hand hold 3rd

'to take the hand and hold it'

e. 必白把臂入林 (世说新语: 赏誉)

bi zi ba bi ru lin

necessarily self take arm enter forest

'(One) must have taken his own arm and entered the forest.'

The clearest evidence for the serial verb construction to be reduced into a monoclausal structure, nevertheless, comes from the obligatory deletion of the coreferential pronoun *zhi* after the second verb in Middle Chinese. In spite of the presence of the third-person pronoun *zhi* after the second verb *sha* in (7a), it is absent after the second verb *sha* in (7b), showing that in Middle Chinese its use is optional when it is coreferential with the object of the initial verb in this serial verb construction.

(7) a. 又取我父母杀之 (六度集经)

you qu wo fu mu sha zhi

again take my parents kill 3rd

'(They) again took my parents and killed them.'

b. 取女杀 (佛说义足经)

qu nu sha

take girl kill

'(Someone) took the girl and killed her.'

The absence of such a coreferential pronoun became obligatory in late Middle Chinese, indicative of the shift from a biclausal serial verb construction into a monoclausal construction. That is, according to Chomsky's (1981) principle B, a pronoun must be free (i.e., not bound) within its governing category (roughly, the clause). The prohibition of the occurrence of the pronoun *zhi* in this construction suggests that it is no longer free from its antecedent *nü* in (7b), because they were then bound in the same clause. That is, the initial verb may have developed into a light verb, thus behaving more like a preposition in a monoclausal than a full verb in a biclausal serial verb construction. The motivation of this development, according to Givón's (2009) theory on clause integration, can be attributed to the sharing of arguments by the two verbs in the series, such as *qu* and *shā* in (7), in which the subjects and objects of the two verbs are identical.

At the same time, *ba* also gradually became much more frequently used than the other verbs in this construction in late Middle Chinese. Yet at this time this construction was still far from being a present-day BA construction, as the sentence in (8), though grammatical in late Middle Chinese, is ungrammatical in Modern Chinese.

(8) 仰山便把茶樹搖 (祖堂集4)

yangshan bian ba cha shu yao

Yangshan then BA tea tree shake

'Yangshan then shook the tea tree.'

For our purpose, the importance of this development into a monoclausal is at least twofold. First, the Old Chinese biclausal pattern, illustrated by *yi dizi yi ren tou he zhong* 以弟子—人投河中 'throw a student into the river' in (5d) was grammaticalized into a monoclausal BA construction with three arguments in (9). In this pattern BA marks the two affected entities *xiaogou* 'small dog' in (9a) and *pingguo* 'apple' in (9b). At the end these sentences, *he-i* 'in the river' and *liang-kou* 'two bites' signal the resultant state of the affected entities, *small dog* and *apple* separately.

(9) a. *ta ba xiaogou reng dao le he-i*

3rd BA small dog throw arrive PER river-inside

'He threw the small dog into the river.'

b. *ta ba pingguo yao le liang-kou*

3rd BA apple bite PER two-bite

'He took two bites of the apple.'

Second, it made possible a monoclausal in which *ba* marks the affected entity in a two-argument structure, exemplified by (8). This is the canonical structure of the modern BA construction that emerged only later in EMC (10th century to 18th century).

32.3 EARLY MODERN CHINESE

In addition to the YI construction involving a number of verbs meaning 'to take' in Middle Chinese, there emerged still another serial verb construction that places a focus on the cause of a cause-and-effect relationship between two events. It was these two serial verb constructions, *lai/qu* purposive and the YI construction, that had interacted to forge the Modern Chinese BA construction. In the *lai/qu* serial verb construction, the initial verb signaling the effect, such as *jiang shengsi* 'take one's life' in (10a), is separated from the second verb *xiang da* 'reply' signaling the cause in (10a) by a purposive marker *lai* 'come'. A similar relationship between the two events in a serial verb construction is marked by *qu* 'go' in (10b).

(10) a. 乃將生死來相答 (增壹阿舍經: 39)

nai jiang shengsi lai xiang da

then take life-death PUR mutually reply

'(One) then take (his) life to reply (to another person).'

b. 夫人往去觀看 (敦煌變文: 悉達太子修道因緣)

furen wang qu guankan

lady go PUR inspect

'Lady went to watch.'

In a 12th-century text, roughly 20% of the *ba* sentences occur in the *lai/qu* purposive such as the one in (11). So *ba*, as a verb at this time, commonly occurred in this serial verb construction.

(11) 把聖人之言來窮究 (朱子語類 12thCCE)

ba sheng-ren zhi yan lai qiongjiu

take sacred-person GEN word come (purpose) study

'(Someone) take the words of the sages (for the) purpose (of) study.'

In addition to the BA *lai/qu* purposive, Figure 32.1 tabulates the frequencies of *ba*'s co-occurrences with a following noun. As far as the grammatical status of *ba* is concerned, the prevalence of this sequence may be indicative of two possibilities: it is a transitive verb, or it is a preposition. The data in Figure 32.1 show that BA developed a much closer association with a noun after the 12th century (38% 12th century; 74% 15th century; 88% 19th century)². At the same time, the percentages of its co-occurrence rate with the *lai/qu* purposive decrease from a commonly occurring sequence to essentially non-occurring: 17% in the 12th century to 11% in the 15th century and 1% in the 19th century. In fact, in Modern Chinese it is ungrammatical for the BA construction to occur in the *lai/*

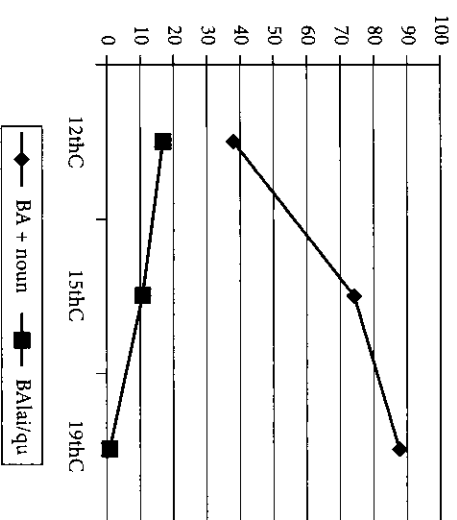


FIGURE 32.1 The percentages of BA + noun and BA lai/qu

qu purposive as it requires two verbs. The decline of *ba*'s usage in the purposive suggests that it is losing its verbal status. In this light, *ba* is becoming even more like a preposition.

A closer examination reveals that over the last 700 years or so, *ba* is truly behaving less and less like a verb, and in Modern Chinese, other than exceptions in some idiomatic expressions, it is no longer used as a verb. For instance, *ba-chi* 'to control' in (12a) survived into Modern Chinese as a fixed term and *ba* (12e) as a classifier. But all of the other verbal uses of *ba* 'to take' in (12) of the 12th century have gone out of fashion over the past 700 years. In other words, it has essentially changed from a light verb into an even more grammatical element.

(12) a. 真个难把持 (朱子语类)

zhen ge nan ba-chi

real CL difficult BA-hold

'Truly it is very difficult to control'

b. 皆是自家不曾把捉得住 (朱子语类)

jia shi ziji bu ceng ba-zhuo de zhu

all be self-Neg. ever BA-take potential live

'It is all because (one) could not take hold of it oneself.'

c. 便把大学为主 (朱子语类)

bian ba da-xue wei zhu

then BA great-learn be main

'Then take Great Learning to be the main (book).'

d. 只看他把笔处 (朱子语类)

zhi kan ta ba bi chu

just look 3rd BA pen place

'Just look at the place where he holds the brush.'

e. 如一把琴丝 (朱子语类)

ru yi-ba fen silk

like one-CL chaos silk

'like a handful of intertwined silk'

The data in Figure 32.2 show that accompanying the expansion of the BA NP sequence, the co-occurrences of BA + V exemplified by (12a and 12b) falls from 61% in the 12th century to nearly zero in the 19th century. That is, *ba* as a verb was once upon a time a common formant in forming a VV verbal compound. Following its loss of verbal status, this common verbal function in EMC is practically dead in modern time.

It is, therefore, the loss of verbal status that has disabled *ba* as a verb to occur in the *ba lai/qu* serial verb purposive. There is further evidence to suggest that *ba* in the Modern Chinese BA construction is not even a light verb but a simple preposition. Note that it was observed previously that in Middle Chinese the synonymous verbs with a meaning 'to take' in the YI construction probably have all evolved into a light verb forming a monoclausal in which the following verb constitutes the main predicate. The evidence of this claim comes from the zero pronominal constraint on the pronoun *zhi* when it, as the object of the second verb, is coreferential with the object of the initial light verb to avoid violating Chomsky's principle B. The same constraint is applicable to all the second verbs focusing on the cause in the *lai-qu* purposive construction, as no pronoun is allowed after the second verb. Therefore, in the EMC purposive BA construction *ba* is probably used as a light verb as it appears to have become the most commonly used lexical item replacing all the verbs of the Middle Chinese YI construction. Any further change of its lexical status could only make it become even more grammatical, thus perhaps losing even the light verb status. It seems only verbs, or light verbs, can occur in the *lai/qu* purposive in Chinese. In contrast, the cognate of *ba* has never quite developed into a BA construction in Wu dialect. The comparable lexical item that is commonly used in the purposive *lai-qu* is *ne* 'to take'. Whereas in Standard Modern Chinese *ne*'s

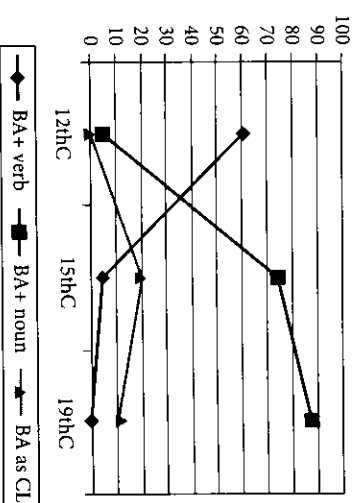


FIGURE 32.2 The distributions of BA in EMC

counterpart *na* in (13b) can occur in the same *lai/qu* purposive, *ba* in (13c) cannot. For that reason, *ba* is probably not a light verb but a preposition in Modern Chinese.

- (13) a. *ne sy le kon*
take book come read
'take the book to read'
b. *na shu lai kan*
take book come read
'take the book to read'
c. **ba shu lai kan*
take book come read

Still another important development of the BA construction in EMC is its predicate. Over the past 700 years or so, the predicate associated with *ba* also develops a closer tie to complex predicates (RVCS; see chapters 23 and 24 in this volume), 39% in the 12th century, 26% in the 15th century, 56% in the 19th century, and 72% in the 20th century.³

In the 12th century, complex predicates (RVC) with two verbal formants like *jie-duan* (break-broken) 'broken' and *fang-xia* (place-down) 'let go' in (14) made up only 39% of the texts investigated. However, after the 19th century, RVC, with 56% and 72% separately in Figure 32.3, has become the dominant predicate type for the BA construction.

- (14) a. 相似把个利刃截断
xiangsi ba ge liren jie-duan
resemble BA CL sharp edge break-broken
'to resemble breaking a sharp sword'

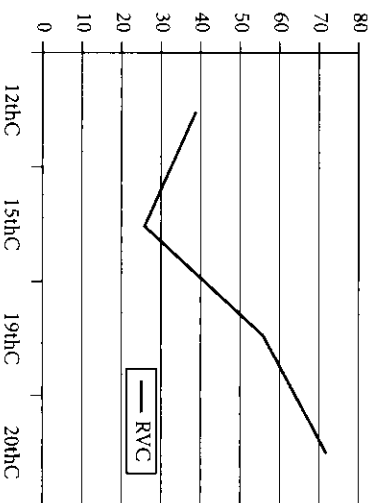


FIGURE 32.3 The percentage of RVC

- b. 若把這天理不放下
ruo ba zhe tian-li bu fang-xia
if BA this heaven-reason NEG. place-down
'If (one) does not let go this heavenly reason...'

Recall from Figure 32.1 and Figure 32.2 that by the 19th century, *ba* had basically lost all of its verbal status. What then does this RVC connection suggest? As a complex predicate, the two morphemes in an RVC represent a cause-and-effect relationship at the surface level, that is, a breaking act causes a sword to attain a resulting state: its being broken. Intriguingly, the rise of the co-occurrences of the RVC and *ba* exactly coincides with the going out of use of a common *ba lai/qu* purposive construction, pinpointing a cause-and-effect link between two events, 17% in the 12th century at text count level. In other words, in the course of forging the Modern Chinese BA construction, the cause-and-effect relationship in its previous common usage has survived the change into the new construction: the sequence, (NP) *ba* NP RVC, has become the canonical form of the Modern Chinese BA construction.

It has been observed (Zhang and Fang 1996; Liu 2006) that Modern Chinese, as a VO type language, places a predicate focus on the linguistic element after the verb of a sentence. It is therefore arguable that the predicate focus of the BA construction is on the second morpheme of the RVC, or any linguistic form after the initial verbal morpheme such as the perfect marker *le*. All of them signal the resultant state of the event. It is, furthermore, necessary to recognize that, as a special serial verb construction, a *lai/qu* purposive construction places a focus on the cause such as *kan* 'read' in (15a), the cause of purchasing the book. But, in a modern BA construction, the focus is shifted to the effect, or the resultant state such as *wan* 'finish' in (15b), rather than the cause *kan* 'read'.

- (15) a. *ni weishenme ma zhe-ben shu? Wo ma lai kan!*
2nd why buy this-CL book? 1st buy come read
'Why did you buy this book? I bought it in order to read (it)!'
b. *ni ba shu kan-wan*
2nd BA book read-finish
'You finish reading the book!'

Further grammaticalization has enabled, other than an RVC, a perfect marker *le*, or something else with a similar nature (additional examples in [9]), to end a BA sentence. The element to signal a resultant state has, thus, developed into a necessity for the BA construction. Now let us return to the set of data noted in (2), now renumbered as (16). The sequence in (16a), *ba* NP V, is unacceptable for the lack of any element after the verb to signal a resultant state. But such a deficiency is rectified by the presence of the sentence-final *le*. Furthermore, the complex predicate *yan-zou* (play-play) 'to play' in (16b) is not an RVC but a coordinate structure. Without the sentence-final

le, or *yi bian* 'one round' in (16c) to signal a resultant state, the sentence is, consequently, unacceptable.

(16) a. *ta ba jiu he* *(*le*)

he BA wine drink CRS

'He has drunk the wine.'

b. *yuedui ba lanse duonaohu yanzou* *(*le*)

music team BA blue-color Danube play CRS

'The orchestra has played the Blue Danube.'

c. *ba lanse duonaohu zai yanzou* *(*yi-bian*)

BA blue-color Danube again play one-CL

'Play the Blue Danube one more time.'

32.4 CONCLUSION

In sum, ensuing linguistic changes of various natures at different times: semantic changes of some lexical items, grammaticalizations of some lexical items and constructions, clause integration of some serial verb constructions, and the information structure of the language, the Modern Chinese BA construction is a specialized construction not generalizable by any simple syntactic term, such as the notion of object marker. It was noted in Section 32.2 that in Middle Chinese the sharing of arguments for the verbs in the serial verb construction, characterized as YI construction, triggered a process of clause integration, leading to the existence of two kinds of monoclausal structure: a three-argument structure with the light verb, *yi*, *ba*, *jiang*, *chi*, and so on and a main verb that did not share a common object, and a two-argument structure with the light verb and the main verb that did share a common object and that was subject to a zero anaphor constraint. In both structures, the nominal after the light verb tends to mark either an instrument or an affected entity. This is the situation when the verb *ba* in EMC started to replace synonymous light verbs in the previous YI construction and interacted with another serial verb construction, the *lai/qu* purposive construction.

It is, however, the interactions between the two-argument monoclausal and the *lai/qu* purposive construction in EMC that have directly given rise to the most basic function of the Modern Chinese BA construction, that is, to place a predicate focus on the resultant state of its predicate. Note that as a topic-prominent language, there has never been an overt subject, or object, marker in Chinese over the past two millennia. The formation of the BA construction in EMC is closely related to the information structure of the language, that is, the *lai/qu* purposive construction as a special structure to place a focus on the cause of a cause-and-effect relationship at the end of a monoclausal. Furthermore,

this cause-and-effect relationship must be represented by two verbal events (separately marked by a light verb and main verb) at the surface level. Although BA's loss of its light verb or verbal status in EMC has disqualified it to occur in the *lai/qu* purposive construction, the cause-and-effect relationship has been maintained by a complex predicate, an RVC, which has become the canonical form of the modern BA construction predicates. Following the general information structure of a VO language that places a predicate focus on its postverbal element, the Modern Chinese BA construction developed its major function: the preposition phrase marked by *ba* has a semantic scope over the entire monoclausal, placing a predicate focus on the resultant state of its predicate (the effect). For this reason, no Modern Chinese *ba* sentence is acceptable unless there is a linguistic form signaling such a resultant state at the surface level.

NOTES

1. Following Li and Thompson (1981), PER is adopted to stand for perfective aspect and CRS is used for perfect aspect, or currently relevant state.
2. The texts used are for the 12th century from chapters 104–121 of 朱子语类, for the 15th century 老乞大朴通事谚解, and for the 19th century 儿女英雄传.
3. The texts used are for the 12th century from chapters 104–121 of 朱子语类, for the 15th century 老乞大朴通事谚解, for the 19th century 儿女英雄传, and for the 20th century results from 王朔's novels by Zhang (2000).

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P A R T 6

PHONETICS AND PHONOLOGY

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CHAPTER 33

PHONETIC STUDY ON
PHONATIONS IN CHINA

JIANGPING KONG

33.1 OVERVIEW

The study on phonation, which is defined as the activity of vocal fold in speech and singing, has a long history in China. A story about the production and application of artificial larynx was documented in an ancient Chinese book titled *Mengxi Bitan* 'Writing in the Mengxi Garden' by Shen Kuo (1031–1095) (Hu 1957) in the Song Dynasty. At present, along with the development of speech technology, phonation study has been carried forward in different fields, such as speech physiology, speech pathology, and speech engineering.

Scholars at the University of California Los Angeles (Maddieson et al. 1985, 1986) started the phonetic study on phonation types in the languages of China in the 1980s. Since then, phonetic studies on phonation types have been most noticeable in the works by Bao Huiqiao (Bao and Zhou 1990; Bao and Lv 1992) and Kong Jiangping (1993, 1995, 1996, 1997a, 1997b, 1997c, 1998); the phonation types in Bai language by Li and Ai (1990) and Ai and Li (1997) ; and Chinese Wu dialects by Cao and Maddieson (1992). In particular, Kong (2001a, 2001b, 2003, 2004a, 2004b, 2005, 2007, 2009, 2011) has focused on the phonation types and the models in physiology, speech production, and oral cultures in China. The phonations in minority languages and Chinese dialect have also been studied (Zhu Xiaonong 2006, 2008, 2009, 2010). This chapter introduces the phonation signals and research methods used in these phonetic studies and their linguistic significance.

33.2 VOICE SIGNALS AND
RESEARCH METHODS

The research method of phonation depends on the signals of speech sounds, including electroglottography (EGG), air flow and pressure, laryngeal electromyography,

photoglottography, fiber stroboscope video, high-speed filming, and high-speed digital imaging. The most popularly used signals are acoustical parameters from speech sounds such as amplitudes of harmonics, voice spectrum tilt, fundamental frequency (F_0), and extracted jitter and shimmer. Open quotient (OQ) and speed quotient (SQ) from EGG signals can be calculated to explain the contact area of vocal folds in vibration. Since these two signals are easily sampled, they are used in research of phonetics and speech science. Another important signal in phonation study is high-speed digital images captured by high-speed digital imaging systems through endoscope or fibroscope, because the detail of vocal vibration can be observed. Although this signal is not easily collected, their parameters such as glottal area function; areas of left, right, anterior, and posterior glottis; lengths of anterior and posterior glottis; widths of left and right glottis; glottal opening instant; glottal closing instant; F_0 ; OQ; and SQ can be extracted to explain linguistic significance and establish glottal geometrical models to imitate the vibration of vocal folds and synthesize different phonation types of different languages and oral performances.

The methods used are (i) harmonic analysis, (ii) inverse filtering analysis, (iii) EGG analysis, (iv) spectrum tilt analysis, (v) high-speed imaging analysis, (vi) multidimensional voice processing, (vii) pitch range analysis, and (viii) voice attack time analysis, among which the first three are often used by phoneticians. In this section, some of these methods are briefly introduced.

Harmonic analysis is often used by phoneticians to study phonation types, because speech sampling and spectrum analysis are easy with a personal computer. In the past century, much research on phonation types in the languages of China has been done by this method (Kirk et al. 1984; Maddieson et al. 1985; Ladefoged et al. 1988; Bao 1990; Kong 1993). Harmonic analysis for phonations mainly depends on the power or amplitude of a harmonic, which is a component frequency of a waveform that is an integer multiple of the F_0 in a voice. The acoustical principle is that when a voice has a lot of power or amplitude in a high frequency, the amplitude of the second harmonic is larger than that of the first harmonic.

Inverse filtering analysis is an easy-to-use method and is often used by speech engineers because it works well with personal computers. With this method, the resonance of the vocal tract can be eliminated from the speech sounds and the source of speech can be obtained (Alku 1992). The signal processing used in inverse filtering is linear predictive coding (LPC), and the steps for inverse filtering are (i) calculating LPC coefficients from a period of speech sound preemphasized, (ii) designing an inverse filter by LPC coefficients, and (iii) filtering the speech sound to get the source of voice. After the voice source is extracted from the speech sound, phonation types can be studied without the interference of vocal tracts.

Electroglottograph analysis is a method by which parameters from EGG signals are extracted. The parameters often extracted from EGG signals are F_0 , OQ, and SQ by which properties of different phonation types can be explained and modeled. F_0 is defined as the reciprocal of the glottal period; OQ is defined as the ratio of the open phase over the whole glottal period, and SQ is defined as the ratio of opening phase

over the closing phase. Actually, these three parameters can be extracted not only from the EGG signal but also from the speech source signal. Usually F_0 reflects the change of pitch, OQ reflects the degree of aspiration, and SQ reflects the degree of tense of vocal folds while vocal folds are vibrating.

33.3 PHONATION TYPES IN VOWELS

The two sets of vowels in the Hani language are called the "lax vowel" and the "tense vowel" linguistically. The terms *tense* and *lax* are not the same as those in English. Physiologically when the muscles of the larynx contract with great strength and short airflow, the vowels are loud and clear in perception when the tense vowels are pronounced. When the muscles of the larynx contract with less strength and long smooth airflow, the vowels are not loud and clear for lax vowels. Ladefoged et al. (1988) studied these two sets of vowels and found that the ratio of airflow over air pressure of lax vowels is larger than that of tense vowels and that the tense vowels are glottalized at the offset of vowels.

The tense and lax vowels were studied acoustically by Kong (1996) from the viewpoint of phonation types, and he found that (i) the tense and lax vowels are produced by different mechanisms of the larynx and they belong to different phonation types. The so-called tense vowels are a kind of creaky voice and the lax vowels are modal voice. (ii) The two phonation types remain unchanged through all the vowels from the onset to the offset. (iii) Voiced consonants have two different phonation types, which are the same as those of the vowels. In addition, the muscles of the larynx contract with more strength when the consonants are pronounced before the creaky vowels. (iv) The articulation of these two sets of vowels are almost the same by analyzing the first and second formants in the tense and lax minimum pairs, and the opening of the mouth in lax vowels is a little bit larger than that of tense vowels. (v) The tone contours in tense and lax vowels are the same, and the durations of lax vowels are longer than those of the tense vowels.

33.4 PHONATION AND ARTICULATION

Different phonations, which are the methods of vocal vibration and articulations that make up the different vocal tracts, often coexist in a vowel or syllable. So attention should be paid to distinguish their functions. The Liangshan Yi language has five pairs of vowels, five tense vowels, and five lax vowels. Maddieson and Ladefoged (1985) found through harmonic analysis that, in Liangshan Yi, the amplitude differences of the second harmonic minus the first harmonic in some tense vowels are smaller than

those in lax vowels. This result fails to explain the nature of tense and lax vowels in the Liangshan Yi language.

As is well known, there are two features in the vowel system in Liangshan Yi: phonation and articulation. The articulations are the same and the phonations are different in the high vowel. The articulations and phonations are all different in the middle and low vowels. Based on this, Kong (1997b) conducted another phonetic study on Liangshan Yi language and found that (i) the articulation of the five lax/tense vowels is quite different; the lax vowels have a closer mouth opening than their tense counterparts; (ii) in the tense vowels, the phonations at offsets are more tense than those at onsets; (iii) the difference between lax and tense vowels in the Liangshan Yi language lies not only in the different tension of vocal folds but also in the different pharyngeal cavity sizes and tongue positions (in tense vowels, the voice is creaky; tongue root advanced, and the pharyngeal cavity enlarged); (iv) in harmonic analysis, the 'h₂-hi' is not appropriate, while the 'F₁-hi' and 'F₂-h₂' are applicable (here 'h₂' stands for the amplitude of the second harmonic, 'hi' stands for the amplitude of the first harmonic, and 'F₂' stands for the amplitude of the second formant).

33.5 PHONATION IN INITIALS

There are twenty-nine consonants in the Axi Yi language, which has eight pairs of tense/lax vowels and three tones, so it is good to study the phonation types of voiced consonants. The method of harmonic analysis was used (Kong 1997a), and it was found that (i) the phonation types are different between the eight pairs of tense/lax vowels (the tense vowel is a kind of pressed or creaky voice and the lax vowel is modal voice); (ii) voiced consonants have two different phonation types, which are the same as those of the vowels following the consonants; (iii) the phonation types of the Axi Yi language are related to the articulation; and (iv) although the three tones in the Axi Yi language are described as 33, 55, and 21, they are closely related to the phonation types of vowels. The F₀ contours in creaky syllable are higher than those in the modal syllable.

According to the results, two kinds of vowels can be distinguished by different phonation types linguistically, and two kinds of voiced consonants can also be distinguished by phonation types: one is a creaky-voiced consonant and the other is a modal-voiced consonant. At present, linguists in China usually regard the phonation features as the articulation features. From the viewpoint of historical linguistics, the initials and final stops in a syllable are usually related to the two phonation types.

33.6 PHONATION IN FINALS

The Zaiwa language, which belongs to the Burmese language, has five lax vowels, five tense vowels, three tones, and sixty-eight finals among which many have voiced

final endings. There are three kinds of final structures, which are single vowel, main vowel+stop ending, and main vowel+nasal ending.

An experiment on phonation types by means of harmonic analysis and inverse filtering found that (i) the tense vowel is a kind of pressed voice and the lax vowel is a modal voice with a little breath; (ii) the phonation types of different final endings are the same as those of the main vowels; (iii) the nasal endings have two different phonation types: one pressed voice and the other modal voice; (iv) finals with stop endings are always pressed voice, from which we can see that phonation types are closely related to stop endings; (v) the phonation types of voiced consonants are the same as those of main vowels; and (vi) the pressed voice feature not only appears in main vowels and voiced initials but also in voiced final endings and stop endings (Caodao 1998; Kong 2001b). According to this, the final can be described as a tense final or a tense syllable linguistically.

33.7 PHONATION IN TONES

When phonation types in Sino-Tibetan languages were discovered, linguists in China wanted to know if phonation features could be a distinctive feature of tones. The Jingpo language, a language in the Burmese branch, has thirty-one initials, eighty-eight finals, and four tones. There are four final structures that are (i) single vowel, (ii) main vowel+vowel ending, (iii) main vowel+nasal ending, and (iv) main+stop ending. When the different phonation types appear in the four kinds of final structures, the tone quality can be defined by the phonation type.

After the acoustical analysis on the Jingpo language, it was found that the tense vowel is a kind of pressed voice and the lax vowel is a modal voice. The results also showed that a phonation type that really appears in different syllables is syllabic and could be used as a suprasegmental feature. Jingpo is a tonal language. Usually tones are described and defined by level and contour forms of F₀. When articulations and F₀ contours in one syllable are the same, the different phonation types are distinctive features produced by the different vibration methods of vocal folds physiologically (Kong 2001b, 2005). In the latter section we can see that F₀ (time domain), OQ, and SQ (frequency domain) can be used to define a tone quality.

33.8 PHONATION OF VOICED ASPIRATION

A phonation type that often appears in languages of China is breathy voice, which can be found in the Miao and Wa languages. The breathy voice is always related to voiced aspirated consonants. Shimenkan Miao has fifty-six consonants, twenty-one finals, and eight phonological tones. The voiced aspiration is described as voiced aspirated

consonant, aspirated vowel, and tones by different linguists for different purposes. Usually the voiced consonants are described as voiceless consonants because they are in complementary distribution with tone 1, 3, 5, and 7.

An experiment on voiced aspiration (Kong 1993) showed that (i) the voiced aspiration is a breathy voice in Shimenkan Miao; (ii) the breathy voice that is syllabic appears not only in voiced aspirated consonant but also in the whole finals; (iii) the tones in syllable of breathy voice are lower than those in unbreathy voice syllable, which indicates that breathy voice could decrease F_0 of tones, especially at the onset of tones. According to the results, breathy voice in Shimenkan Miao could be described as voiced aspirated consonant, voiced aspirated vowel, and voiced aspirated tone phonemically and phonologically for different linguistic purposes.

33.9 PHONATION IN MANDARIN TONES

Mandarin is a tonal language that has four basic tones and twenty diatones including the four neutralized diatones. In this section, three studies on phonation patterns or models of tones are briefly introduced.

The patterns of tones and diatones in Mandarin were studied by EGG analysis, and the parameters of F_0 , OQ, and SQ were extracted from EGG signals. The results showed (i) the F_0 contour of Tone 1 (Yinping), whose tone value is 55 by the five-letter tone system and is "high level"; the SQ contour is also high level and the OQ contour is "rising"; (ii) the F_0 contour of Tone 2 (Yangping), whose tone value is 35 and is rising, the SQ contour is "falling," and the OQ contour is rising, which is the same as that of tone 1; (iii) the F_0 contour of Tone 3 (Shangsheng), whose tone value is 214 and is "low level," the SQ contour is high level, and the OQ contour is "falling-rising"; (iv) the F_0 contour of Tone 4 (Qusheng), whose tone value is 51 and is falling, the SQ contour is rising, and the OQ contour is rising-falling-rising. The same method and parameters were used in the study of the diatones in Mandarin (Kong 1998).

The phonation model of tones and diatones in Mandarin were studied by means of inverse filtering. Although LPC inverse filtering analysis is a good method to extract voice source from speech sound, it has weaknesses in obtaining voice source, because it is an all poles model. As is well known, there are zeros (antiresonance or antiformant) in speech sound when nasals are pronounced, and zeros will also appear in the coupling of the vocal tract and trachea; the piriform sinus will also produce antiresonance. In the phonetic study on phonations in China's languages, normal vowels, such as /a/ or /e/, are often used as experimental samples and vowels with lower first formants are not used, because the power of F_0 could be reduced in the inverse filtering. Since this method could not extract zeros (antiformants) for the inverse filtering design, the inverse filtered acoustical sources display single peak waveform, double peak waveform, and tripeak waveform when F_0 decreases gradually (Kong 2004a).

The phonation model was established through such source waveforms, which could be used to improve the speech intelligibility and naturalness in speech synthesis.

With the development of high-speed imaging, the vocal fold vibration of tones in Mandarin can be observed and captured by endoscope or fiberscope through high-speed video camera and the parameters, such as F_0 , OQ, SQ, and jitter, are extracted from dynamic glottis of tones for phonation research and modeling. The model of dynamic glottis could not only synthesize different phonation types, such as modal voice, falsetto, fry voice, creaky voice, and so on, but also synthesize disordered voices such as diplophonia (Kong 2007).

In comparing these three studies, we can see that the research sources are not the same. The first is EGG signal, the second is speech signal and the third is image signal. Although the signals are different, they all reveal the phonation natures in the tones of Mandarin.

33.10 PHONATION STUDY BY HIGH-SPEED IMAGE

In the 1970s, the techniques of high-speed imaging developed quickly. This technique was also used in studying the vibration of vocal folds. With digital image signal processing, many parameters could be extracted from the high-speed images (Kong 2007). There are twenty-four parameters extracted from an image, which can be classified into four groups: (i) basic parameters, (ii) glottal area parameters, (iii) the length and width parameters, (iv) the parameters of glottal area function. In these parameters, the glottal area function, the left and right widths of glottis, the anterior and posterior lengths of glottis, F_0 , OQ, and SQ are very important for phonation modeling. Figures 33-1, 33-2, and 33-3 illustrate 3 typical phonations.

There are two plots in the three figures. In Figure 33-1, the left displays twenty-four vocal fold images of modal voice and the right displays thirteen parameters extracted from dynamic glottis. In Figure 33-2, the left plot displays twenty-four vocal fold images of breathy voice and the right displays thirteen parameters of this voice. In Figure 33-3, the left displays twenty-four vocal fold images of creaky voice and the right displays thirteen parameters of this voice.

Through the high-speed images, vibration of vocal folds of different phonation types was observed and studied both acoustically and physiologically. The research by high-speed imaging has greatly improved the research on phonation types in China.

33.11 LINGUISTIC SIGNIFICANCE

In the languages of China discussed here, there are at least four phonation types that are significant in distinguishing meanings. They are "modal voice," "breathy voice," "pressed

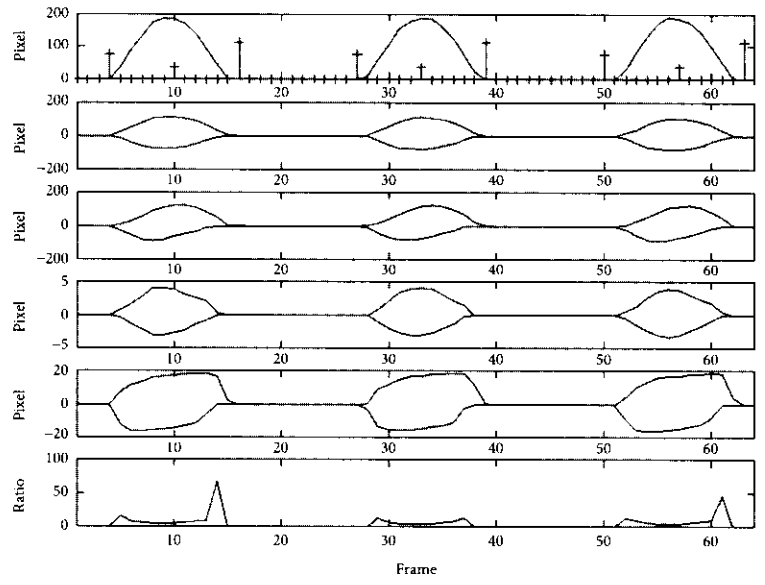
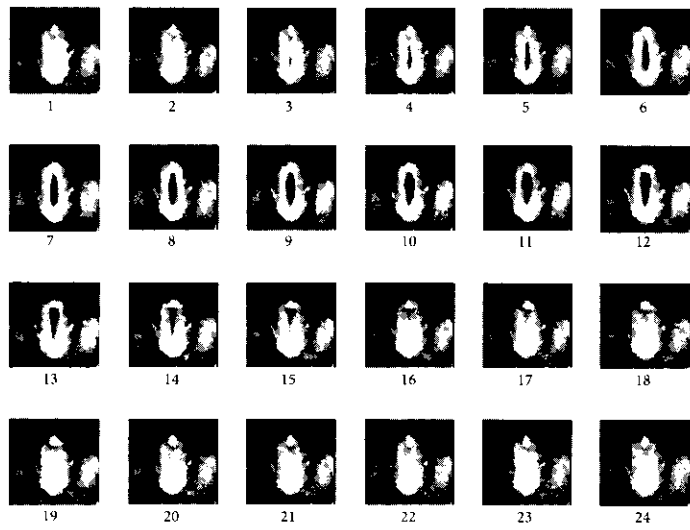


FIGURE 33.1 The left plot displays twenty-four frames of vocal fold images of a modal voice. The right plot displays thirteen parameters of the modal voice.

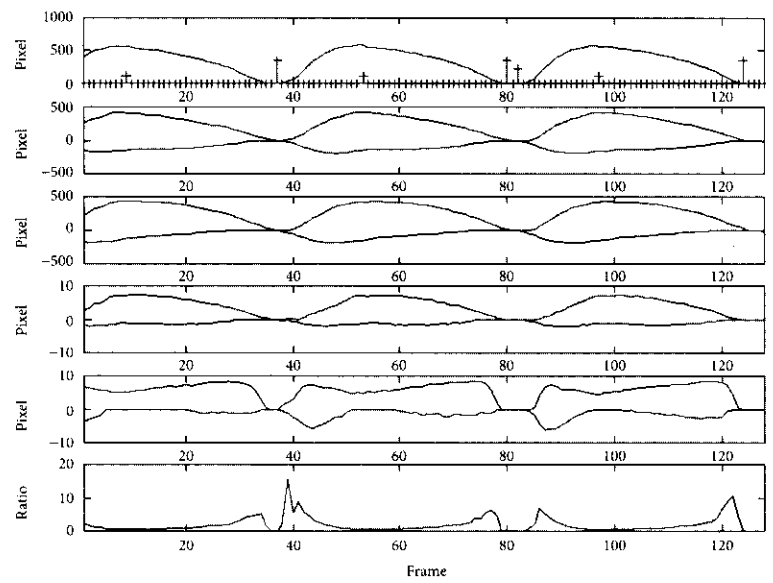
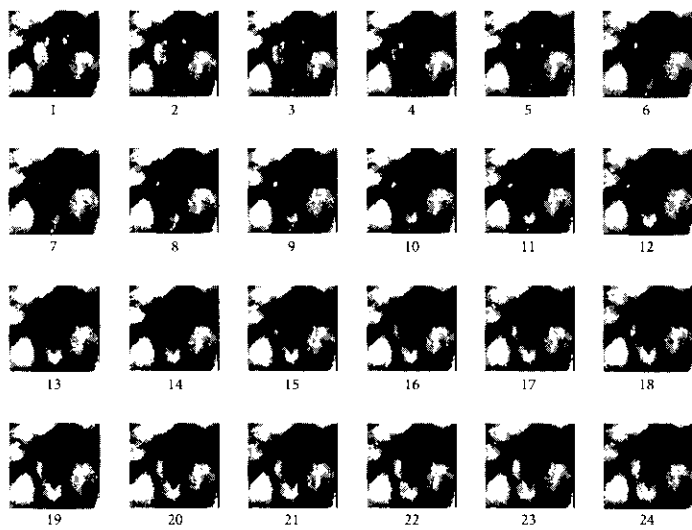


FIGURE 33.2 The left plot displays twenty-four frames of vocal fold images of a breathy voice. The right plot displays thirteen parameters of the breathy voice.

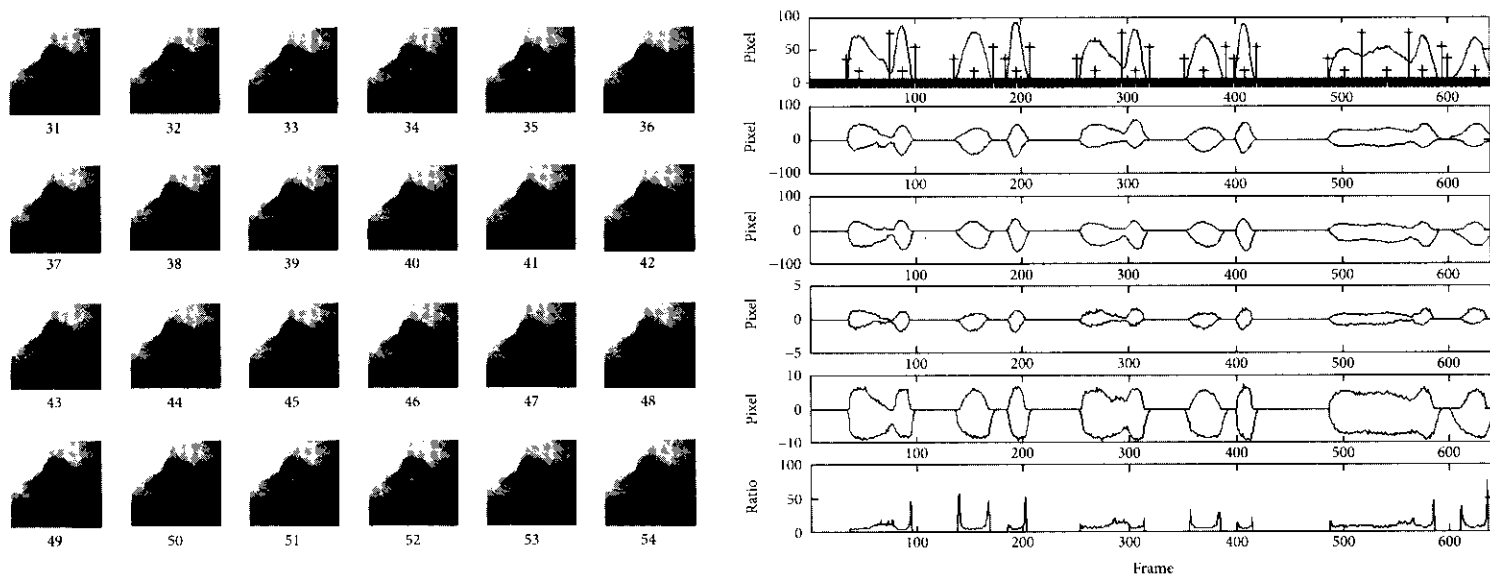


FIGURE 33.3 The left plot displays twenty-four frames of vocal fold images of a creaky voice. The right plot displays thirteen parameters of the creaky voice.

voice,” and “creaky voice.” The phonation type, which usually has modest F_0 , modest OQ (around 55%), and modest SQ (around 200), is regarded as modal voice. The phonation type, which usually has relatively small F_0 , large OQ, and small SQ, is regarded as breathy voice. The phonation type, which usually has relatively large or small F_0 , small OQ, and large SQ, is regarded as pressed voice. The phonation type, which usually has very small F_0 , small OQ, very large SQ, and irregular period or large jitter, is regarded as creaky voice. These phonation types are defined linguistically based on acoustical and EGG parameters.

In phonetics, an acoustical vowel chart is used to display the tongue position and mouth opening of a vowel. In the study on phonation types, Kong (2001b) has developed an “acoustical phonation chart” to display the status of vocal fold vibration of phonations. The parameters used in this chart, which can be two-dimensional or three-dimensional are F_0 , OQ, and SQ. See Figure 33.4. Figure 33.4 (left) is a two-dimensional acoustical phonation chart whose x-axis is OQ and y-axis is SQ. It displays five phonation types. Figure 33.4 (right) is a three-dimensional acoustical phonation chart whose x-axis is F_0 , y-axis is SQ, and z-axis is OQ. It displays the phonation distributions of ordinary speech and Lama chanting in three-dimensional space.

According to the phonation studies of languages in China, phonation types are often syllabic. When the initials, finals, and tone contours are identical in two single-syllable words that are distinguished from each other only by phonation types, the phonation types can be regarded as “tone quality,” because the F_0 contours reflect the phonation feature of tones in a time domain that can be regarded as “tone pattern,” and the phonation types reflect the phonation feature of tones in frequency domain.

A vowel is produced by both vibration of vocal folds (speech source) and articulation of vocal tract (resonance); it is wrong to think that vowels are produced only by articulation. The vowel quality can be regarded as an “articulation quality” when articulation is used to distinguish meanings, and it can also be regarded as a “phonation quality” when phonation type is used to distinguish meanings. These two kinds of qualities can also be used to describe and define voiced consonants. Based on the concepts of articulation quality and phonation quality, vowel quality has three different

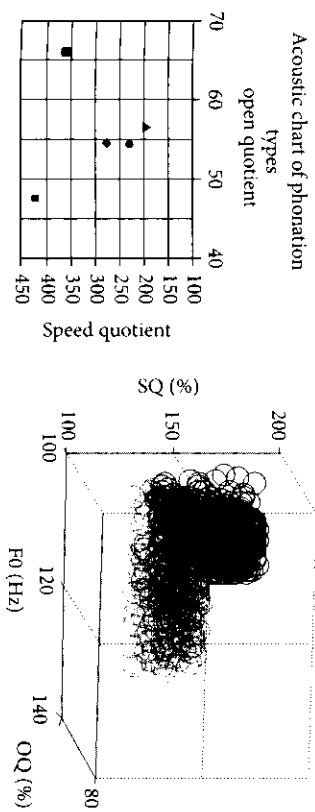


FIGURE 33.4 A two-dimensional acoustical phonation chart and a three-dimensional acoustical phonation chart.

forms: (i) same articulation quality and different phonation qualities, (ii) different articulation qualities and same phonation quality, (iii) different articulation qualities and phonation qualities.

With the development of speech technology, many new methods are used in phonation research. For instance, vocal attack time is a new method developed in the fields of speech physiology (Baken and Orlikoff 1998). By this method, the hard and soft voices can be identified. At present, this method is not widely used in the phonetic study on phonations. According to the preliminary study by Kong (unpublished), hard and soft voices indicate the relationship between tones and initials. So it may be used to reveal the nature of tone's origin. In a word, the phonetic and linguistic studies on phonation types have greatly improved the research of phonetics, speech engineering, and speech science in China.

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CHAPTER 34

VOWEL DISTRIBUTION IN ISOLATED AND CONTINUOUS SPEECH

The Case of Cantonese and Mandarin

FENG SHI, GANG PENG, AND YI LIU

34.1 INTRODUCTION

WHAT is the relationship between vowel articulation parameters, such as height and frontness, and their acoustic values, such as formant frequencies? How do such acoustic values change across gender and age? Peterson and Barney (1952) pioneered such a study of examining various acoustic parameters of vowels in American English. In their study, recordings were made from subjects (thirty-three men, twenty-eight women, and fifteen children) producing the carrier /h_d/, where ten different target vowels were embedded to form words like *hood*, *hid*, and so on. The major finding was that different groups of subjects have different mean formant frequencies for the same vowel, with men the lowest, followed by women, and children the highest. The data obtained were then plotted in the F_1 to F_2 plane to show their relative positions in the acoustic space. Samples from different vowels were located quite evenly in the whole acoustic space, with adjacent vowels overlapping with each other in this space.

Hillenbrand et al. (1995) conducted a study similar to Peterson and Barney (1952) but on a larger scale. They recruited forty-five men, forty-eight women, and forty-six children (twenty-seven boys, nineteen girls) to obtain acoustic samples of twelve vowels in the same carrier /h_d/. Formants F_1 through F_4 were then extracted for data analyses. The formant frequencies, in ascending order, men < women < children were again obtained. However, there were also differences from Peterson and Barney (1952) in aspects like the intercategory overlap between adjacent vowels and average formant frequencies.

Table 34.1 Vowels in Cantonese and Mandarin

| Cantonese vowels | Samples | Meanings | Mandarin vowels | Samples | Meanings |
|------------------|----------|----------|-----------------|-----------|-----------|
| /i/ | 衣/ɿ55/ | clothes | /i/ | 衣/ɿ55/ | clothes |
| /u/ | 夫/fu55/ | husband | /u/ | 呼/ku55/ | to exhale |
| /y/ | 书/sy55/ | book | /y/ | 鱼/y35/ | fish |
| /a/ | 沙/sa55/ | sand | /a/ | 发/fa55/ | to send |
| /e/ | 除/se55/ | to lend | /ɛ/ | 鹅/e35/ | goose |
| /ɔ/ | 梳/sɔ55/ | comb | /o/ | 波/po55/ | wave |
| /œ/ | 靴/hœ55/ | boot | /ɤ/ | 丝/sɿ55/ | silk |
| /ɨ/ | 色/sɨ55/ | color | /ɨ/ | 吃/tʃʰɨ55/ | to eat |
| /el/ | 恤/setʃ/ | shirt | /ɛʃ/ | 儿/ɛʃ35/ | son |
| /el/ | 湿/sepsʃ/ | wet | /ɛʃ/ | 的/tʃɨ/ | of |
| /ɔl/ | 叔/sokʃ/ | uncle | | | |

Production of consonants involves movement of articulators, which consequently modifies the formant movement of surrounding vowels. Lehiste and Peterson (1961) made use of different combinations of consonant-vowel-consonant sequences to investigate the effect of consonants on formant movement. In another study, Ohman (1966) provided an excellent example of the contextual influence of surrounding consonants on formant movement. In the latter study, different combinations of vowel-consonant-vowel sequences were used to elicit formant inflections caused by preceding and following consonants from utterances produced by Swedish, American, and Russian speakers. The bilabial consonant /b/, for instance, *lowers* the onset portion of F₂ when it precedes the target vowel and also *lowers* offset portion of F₂ when it follows the target vowel. In contrast, the velar consonant /g/ has a *raising* effect on the onset/offset portions of F₂ when it precedes/follows the target vowel.

While the aforementioned research focused on isolated syllables, it is well acknowledged that, in continuous speech, acoustic parameters, such as formants, fundamental frequency, intensity, and duration of speech units differ greatly due to various factors like speech rate, sentential position, and contextual influences. The variability associated with continuous speech, compared to isolated speech segments, also exists in acoustic dimensions other than formants. Han and Kim (1974), Gandour et al. (1994), and Xu (1997) reported variabilities in fundamental frequency of tone languages (Vietnamese, Thai, and Mandarin, respectively) due to contextual influences. In all these studies, different tonal sequences were constructed to elicit the effect of tones preceding and following the target syllable. From these studies, it is clear that continuous speech results in much larger variability in the acoustic signals.

The two dialects, Cantonese and Mandarin, that stem from the same ancestor have two different vowel systems. Table 34.1 shows the vowel systems of these two languages, where the numbers after the IPA symbols indicate tone values. The Mandarin syllable /ɿ/ is associated with the neutral tone that does not have specific tone values (Chao

1930). There are eleven monophthongs in Cantonese (Bauer and Benedict 1997) and ten in Mandarin (Wu 1964). Note that a vowel duration distinction exists in Cantonese, in which seven vowels are long and four vowels are short, with the latter always occurring before a stop ending (Zee 1991).

Cantonese and Mandarin vowels have been previously analyzed in several studies (Fok 1968; Howie 1976; Zee 1991; Shi 2002; Lee and Zee 2003; Shi and Liu 2005). However, the vowels that were analyzed were embedded in a fixed carrier and usually with speech samples from only a few speakers or a few vowel tokens per speaker.

This chapter presents formant frequencies of vowels produced both in isolated syllables and in continuous speech. Both the mean values and the variability measures (standard deviation), grouped by gender, are provided. By comparing vowel formant frequencies across gender, dialects, and speech modes (isolated syllable vs. continuous speech), this chapter intends to help readers better understand vowel production.

34.2 FORMANT FREQUENCIES OF VOWELS IN ISOLATED SYLLABLES

There are seven Cantonese long vowels: /i, u, y, a, ɛ, ɔ, œ/. Except for /œ/, where only one host syllable was used (due to the small number of commonly used characters for this vowel), six host syllables were used for each of other Cantonese vowels. Table 34.2 depicts the host syllables for Cantonese vowels. According to Shi (2002), the Mandarin vowels were divided into four levels according to the environments in which they occur: solely (the first level, i.e., monophthong), with a glide but without an ending (the second level), without a glide but with an ending (the third level), and with both a glide and an ending (the fourth level). There are seven Mandarin vowels at the first level: /i, u, y, a, ɿ, ɨ/, as depicted in Table 34.3. Four host syllables were used for each of the first five Mandarin vowels, while only one syllable was used for each of the last two Mandarin vowels.

Table 34.2 Host syllables for Cantonese seven long vowels

| Vowels | Syllable 1 | Syllable 2 | Syllable 3 | Syllable 4 | Syllable 5 | Syllable 6 |
|--------|------------|------------|------------|------------|------------|------------|
| /i/ | 至/ʃi33/ | 纸/ʃi35/ | 时/ʃi11/ | 字/ʃi22/ | 市/ʃi13/ | 师/ʃi55/ |
| /u/ | 孤/ku55/ | 乎/fu11/ | 妇/fu13/ | 腐/fu22/ | 顾/ku33/ | 古/ku35/ |
| /y/ | 舒/sy55/ | 柱/ʃy13/ | 恕/sy33/ | 厨/ʃy11/ | 暑/sy35/ | 树/sy22/ |
| /a/ | 架/ka33/ | 化/fa33/ | 霞/ha11/ | 巴/pa55/ | 霞/pa22/ | 马/ma13/ |
| /e/ | 谢/ʃe22/ | 蛇/ʃe11/ | 社/ʃe13/ | 写/ʃe35/ | 借/ʃe33/ | 遮/ʃe55/ |
| /ɔ/ | 座/ʃpʰɔ22/ | 我/ŋɔ13/ | 破/pʰɔ13/ | 波/pɔ55/ | 鹅/ŋɔ11/ | 左/ʃsɔ35/ |
| /œ/ | 靴/hœ55/ | | | | | |

Table 34.3 Host syllables for seven first-level Mandarin vowels

| Vowels | Syllable 1 | Syllable 2 | Syllable 3 | Syllable 4 |
|--------|------------|------------|------------|------------|
| /i/ | 衣/i:55/ | 通/ɒu55/ | 低/ti:55/ | 基/ki:55/ |
| /u/ | 乌/u:55/ | 居/ky:55/ | 趋/ky:55/ | 姑/ku:55/ |
| /y/ | 迂/y:55/ | 巴/pa:55/ | 搭/ta:55/ | 虚/cy:55/ |
| /a/ | 啊/a:55/ | 遮/tʂy:55/ | 歌/ka:55/ | 台/ka:55/ |
| /ɛ/ | 阿/ɛ:55/ | | | 科/ku*55/ |
| /ɛ/ | 资/tʂɛ:55/ | | | |
| /ɿ/ | 知/tʂɿ:55/ | | | |

Table 34.4 Mean F₁ and F₂ (in Hz) frequencies and their standard deviations (in parenthesis) for seven Cantonese long vowels

| | /i/ | /y/ | /u/ | /e/ | /æ/ | /ɔ/ | /a/ |
|---------|--------------|-----------|----------|------------|-----------|-----------|------------|
| F1 (Hz) | M 331 (38) | 368 (44) | 385 (39) | 546 (65) | 527 (62) | 559 (55) | 731 (72) |
| F | 396 (39) | 431 (32) | 440 (33) | 666 (79) | 688 (76) | 636 (59) | 886 (126) |
| F2 (Hz) | M 2185 (147) | 1820 (88) | 738 (71) | 1852 (116) | 1466 (81) | 852 (107) | 1165 (84) |
| F | 2720 (126) | 2096 (86) | 831 (63) | 2211 (117) | 1652 (88) | 944 (96) | 1333 (209) |

Table 34.5 Mean F₁ and F₂ (in Hz) frequencies and their standard deviations (in parenthesis) for seven first-level Mandarin vowels

| | /i/ | /y/ | /u/ | /e/ | /ɛ/ | /ɔ/ | /a/ |
|---------|--------------|------------|------------|------------|-----------|-----------|------------|
| F1 (Hz) | M 259 (31) | 270 (55) | 371 (99) | 349 (79) | 313 (61) | 457 (82) | 838 (98) |
| F | 361 (65) | 383 (84) | 475 (82) | 453 (68) | 386 (62) | 559 (49) | 953 (182) |
| F2 (Hz) | M 2329 (186) | 1929 (87) | 1373 (84) | 1502 (114) | 714 (41) | 1085 (97) | 1248 (134) |
| F | 2673 (227) | 2170 (119) | 1581 (166) | 1790 (161) | 728 (108) | 1224 (95) | 1426 (208) |

Sixty native Cantonese speakers in their twenties (half male, half female, mean age = 25.0 yr, standard deviation = 2.5) were asked to read these thirty-seven carrier characters (without repetition). Twenty native Beijing Mandarin speakers in their twenties (half male, half female, mean age = 23.0 yr, standard deviation = 2.6) were asked to read the twenty-two carrier characters (one repetition). Formant frequencies were measured at the stable portion of each token.

Minimum ellipses of varying areas to cover about 90% of the points were drawn for each vowel, as shown in Figure 34.1a and 34.1b, where dark and light symbols represent tokens from male and female subjects, respectively. Each point in the vowel charts represents the average F₁ and F₂ frequencies for a certain vowel by a certain speaker.

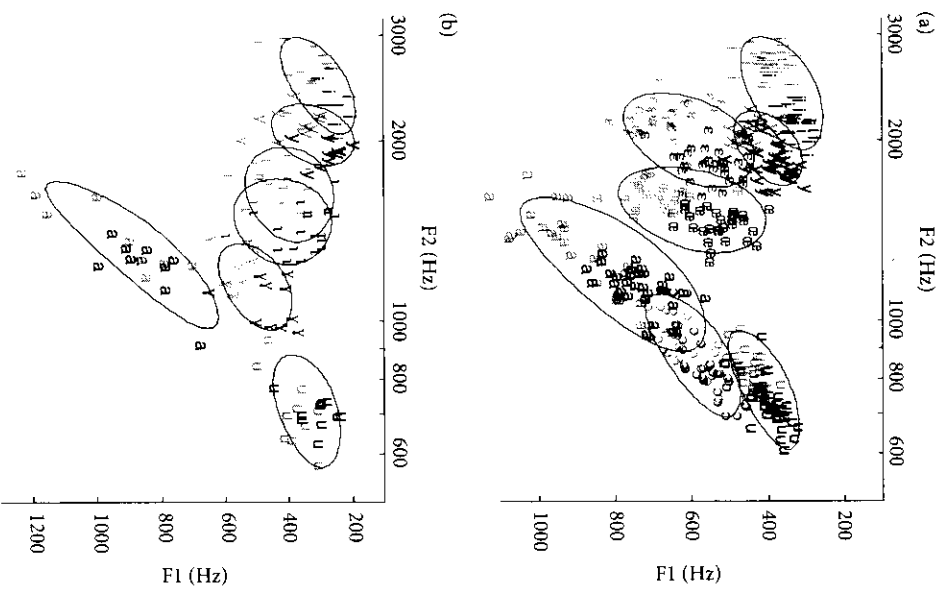


FIGURE 34.1 Formant (F₁-F₂) plots of Cantonese and Mandarin vowels in isolated syllables: (a) seven Cantonese long vowels (b) seven first-level Mandarin vowels

Tables 34.4 and 34.5 present mean formant frequencies (F₁ and F₂) of Cantonese and Mandarin vowels produced in isolated syllables. Generally speaking, in agreement with previous literature (e.g., Peterson and Barney 1952), female subjects had higher formant frequencies than males.

34.3 FORMANT FREQUENCIES OF VOWELS IN CONTINUOUS SPEECH

The Cantonese corpus used was CUSENT (Lee et al. 2002). Utterances from sixty-eight (half male, half female) speakers were used in this analysis. For the Mandarin corpus,

the analysis was performed on the utterances from seventy-six speakers (half male, half female) of the later developed part of the corpus from Chinese Project 863 (a program funded and administered by the government of the People's Republic of China intended to stimulate development of advanced speech technologies). An earlier portion of this Mandarin corpus was reported in Wang (1999). The speakers of these two continuous speech corpora were also in their twenties, age-matched to the speakers of the isolated syllables used in this chapter.

In contrast with previous phonetic/acoustic studies based on purely manual measurements by phoneticians, computer programs were used for automatically segmenting continuous speech, where an HMM-based recognizer was operated in a forced-alignment mode (Wightman and Talkin 1997). Due to the vast amount of data of continuous speech, automatic formant extraction was first carried out in the software Praat (Boersma and Weenink 2008), complemented by manual verification and fine-tuning by two phoneticians. In general, good consistency was found between the computer segmentation and that by the phoneticians. In the manual verification process, it was reported that automatic measurement of F_1 was the most accurate, followed by F_2 , and lastly F_3 . This is probably due to the general trend of decrease in amplitude for higher formants. In particular, for F_3 , accurate reading was difficult even with visual inspection for some tokens. However, F_1 and F_2 frequencies were generally consistent between the computer programs and human evaluation.

The analysis of the main vowels in diphthongs, such as /ia/, /e/, /ei/, /uo/ and so on might also be interesting. But because the phoneme boundaries for diphthongs were more difficult to locate precisely by computer programs (even by phoneticians) and the formant trajectories varied more dramatically for diphthongs, only monophthongs (single vowels) were reported. In order to further reduce the influence of surrounding consonants, only vowels in an open syllable, structured as (C)V, would be used if the number of tokens of the target vowels was sufficient for statistical analysis. Besides, all syllables at the phrase-final position were excluded because of the phrase final lengthening effect (Klatt 1976; Crystal and House 1988; Campbell and Isard 1991; Wightman et al. 1992).

During the analysis, some vowel tokens were produced with very short duration, and consequently the formant frequencies were difficult to determine because there were almost no stable portions for the formant trajectories. So we have further excised the tokens of vowels whose duration were shorter than the mean duration of the corresponding vowels. The numbers of tokens after excision per vowel per speaker was about twenty-two for Cantonese and forty-three for Mandarin.

Minimum ellipses of varying areas to cover about 90% of the points were also drawn for each vowel, as shown in Figure 34.2a, 34.2b, and 34.2c. Akin to the formant plots of vowels in isolated syllables, each point in the vowel charts represents the average F_1 and F_2 frequencies for a certain vowel by a certain speaker.

Tables 34.6 and 34.7 present mean formant frequencies (F_1 , F_2 , and F_3) of Cantonese and Mandarin vowels. Again, in agreement with the previous literature (e.g. Peterson and Barney 1952), female subjects had higher formant frequencies than male subjects.

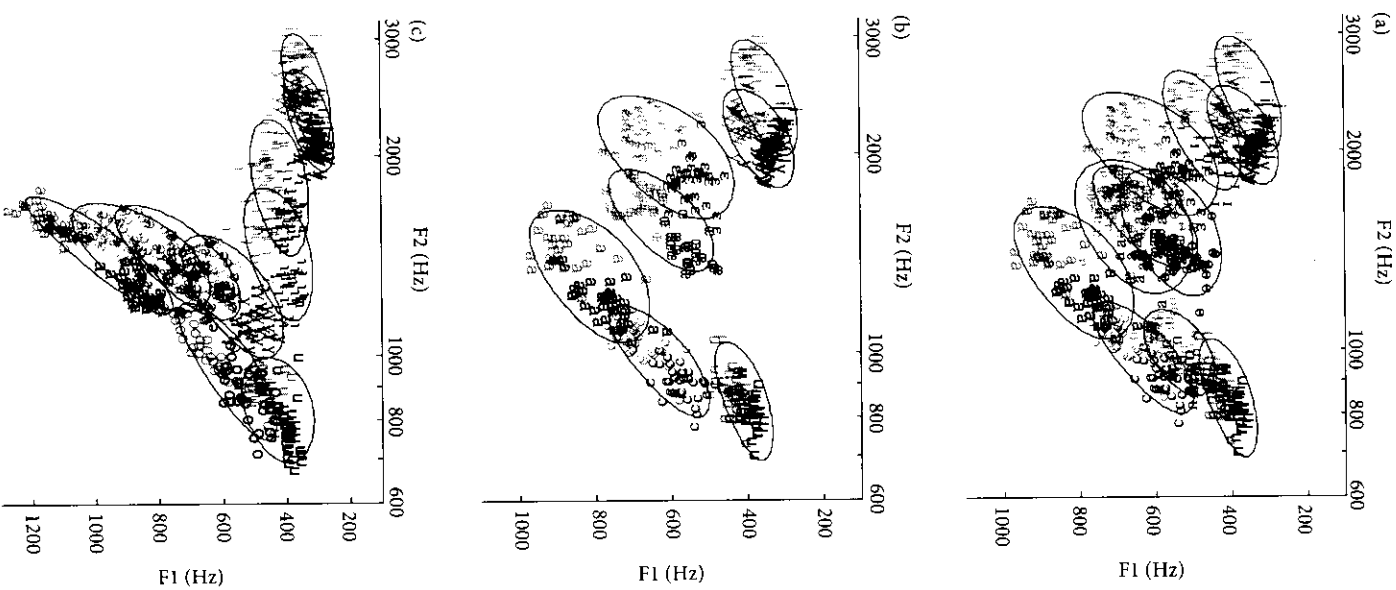


FIGURE 34.2 Formant (F_1 - F_2) plots of Cantonese and Mandarin vowels in continuous speech. (a) Cantonese eleven long vowels (b) Cantonese seven long vowels (c) Mandarin ten vowels

Table 34.6 Mean F₁, F₂, and F₃ frequencies and their standard deviations (in parenthesis) for Cantonese vowels

| | | /i/ | /y/ | /u/ | /ɛ/ | /œ/ | /ɔ/ | /a/ | /ɨ/ | /ə/ | /ʊ/ | /ɐ/ |
|---------------------|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| F ₁ (Hz) | M | 312 (19) | 333 (21) | 389 (22) | 541 (41) | 557 (38) | 576 (41) | 757 (54) | 433 (37) | 504 (43) | 503 (33) | 606 (45) |
| | F | 390 (27) | 403 (32) | 433 (29) | 677 (48) | 676 (48) | 690 (51) | 869 (61) | 514 (31) | 601 (51) | 571 (45) | 703 (49) |
| F ₂ (Hz) | M | 2195 (130) | 2008 (95) | 831 (48) | 1846 (135) | 1448 (79) | 914 (52) | 1202 (69) | 1970 (138) | 1382 (93) | 940 (50) | 1423 (87) |
| | F | 2759 (121) | 2278 (124) | 895 (68) | 2189 (128) | 1720 (109) | 1069 (70) | 1482 (114) | 2397 (139) | 1661 (104) | 1055 (66) | 1724 (121) |
| F ₃ (Hz) | M | 3023 (134) | 2514 (121) | 2679 (139) | 2620 (110) | 2470 (99) | 2782 (163) | 2675 (177) | 2512 (114) | 2656 (107) | 2685 (153) | 2648 (130) |
| | F | 3458 (228) | 2798 (127) | 2956 (151) | 3127 (128) | 2893 (141) | 3157 (282) | 3126 (237) | 3076 (270) | 3060 (164) | 3004 (171) | 3131 (128) |

Table 34.7 Mean F₁, F₂, and F₃ frequencies and their standard deviations (in parenthesis) for Mandarin vowels

| | | /i/ | /y/ | /ɨ/ | /ɯ/ | /u/ | /ɤ/ | /o/ | /ə/ | /ɚ/ | /a/ |
|---------------------|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| F ₁ (Hz) | M | 301 (24) | 295 (22) | 383 (29) | 388 (27) | 389 (23) | 500 (47) | 518 (51) | 641 (50) | 742 (64) | 851 (48) |
| | F | 358 (29) | 350 (31) | 460 (47) | 445 (38) | 465 (41) | 633 (58) | 641 (59) | 838 (63) | 957 (67) | 1118 (62) |
| F ₂ (Hz) | M | 2241 (122) | 2091 (100) | 1306 (105) | 1657 (107) | 793 (72) | 1141 (77) | 890 (83) | 1303 (88) | 1322 (95) | 1288 (66) |
| | F | 2850 (123) | 2503 (100) | 1613 (123) | 2026 (131) | 891 (56) | 1372 (88) | 1045 (84) | 1534 (100) | 1545 (69) | 1619 (73) |
| F ₃ (Hz) | M | 3167 (125) | 2658 (195) | 2848 (142) | 2922 (206) | 2822 (113) | 2727 (147) | 2859 (158) | 2666 (156) | 2384 (137) | 2630 (152) |
| | F | 3694 (138) | 2929 (106) | 3317 (185) | 3157 (254) | 3201 (159) | 3235 (203) | 3295 (207) | 2737 (246) | 2461 (122) | 2976 (188) |

The perceptual implication is that formant frequency can serve as another important acoustic cue, in addition to pitch, for gender discrimination in oral communication (e.g., Whiteside 2001).

34.4 DISCUSSIONS AND SUMMARY

34.4.1 Relationship Between Vowel Formant Frequencies and Tongue Positions

In general, the formant plots are consistent with corresponding vowel charts that are based on tongue positions (see vowel chart for Cantonese in Zee 1991 and vowel chart for Mandarin in Lee and Zee 2003). More specifically, high vowels have a low F_1 and low vowels have a high F_1 ; back vowels have a low F_2 and front vowels have a high F_2 .

34.4.2 Vowel Formant Frequencies Across Gender

As illustrated in Sections 34.3 and 34.4, female subjects have higher formant frequencies than male subjects in all cases, which is in agreement with previous literature (e.g., Peterson and Barney 1952). This difference is due to the fact that female subjects in general have shorter vocal tracts than male subjects do, and a shorter vocal tract exhibits inherently higher resonance frequency. Based on the study by Goldstein (1980), the estimated average length of the vocal tract in adult male subjects is 16.9 cm and is 14.1 cm in adult females.

34.4.3 Vowel Formant Frequencies Across Speech Modes

In the case of Cantonese, the number of speakers was comparable in the isolated syllables (sixty speakers) and in continuous speech (sixty-eight speakers). Therefore, the comparison of vowel formant patterns between isolated syllables and continuous speech was made only for Cantonese. Table 34.8 presents mean formant frequencies (F_1 and F_2) of Cantonese vowels in isolated syllables and in continuous speech. As seen in Figure 34.3, the F_1 frequencies of each of the Cantonese long vowels (except for /y/ and /ɔ/) do not differ much between isolated syllables and continuous speech, where dark symbols represent tokens from continuous speech and light symbols with a subscript *i* represent tokens from isolated syllables. However, except for vowel /ɛ/, all other six vowels show reduced F_2 frequencies when produced in isolated syllables, suggesting the tongue position of producing a vowel in isolated syllables is generally more toward the back of the vocal tract.

Table 34.8 Mean F_1 and F_2 frequencies for seven Cantonese long vowels

| | /i/ | /y/ | /u/ | /ɛ/ | /œ/ | /ɔ/ | /a/ |
|------------|------|------|-----|------|------|-----|------|
| F_1 (Hz) | 364 | 399 | 412 | 605 | 607 | 598 | 809 |
| Continuous | 351 | 369 | 411 | 608 | 617 | 633 | 813 |
| F_2 (Hz) | 2452 | 1958 | 785 | 2031 | 1558 | 898 | 1249 |
| Continuous | 2477 | 2143 | 863 | 2015 | 1584 | 991 | 1342 |

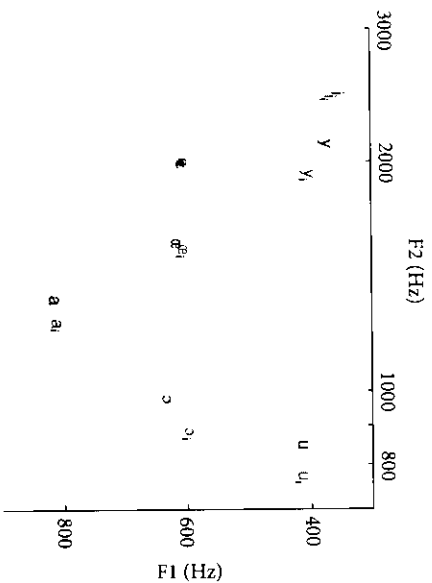


FIGURE 34.3 Formant (F_1 - F_2) plots of Cantonese vowels

34.4.4 Vowel Formant Frequencies Across Dialects

Given the similar number of speakers of the continuous speech corpora for the two dialects, cross-dialectal comparison was made based on vowel patterns in continuous speech. A statistically significant difference was observed in vowel space between the two dialects. Specifically, the Mandarin vowel space is larger than that of Cantonese. Vowel spaces of the two languages are plotted together for comparison in Figure 34.4. For clarity, only the peripheral vowels /i/, /a/, and /u/ are shown. It is obvious that the vowel space triangle formed by joining the peripheral vowels is larger for Mandarin than for Cantonese.

To confirm whether such difference has statistical significance, individual tokens of the peripheral vowels were fed into a statistical test, with the results shown in Table 34.9. It indicates that the vowel /a/ is the main contributor to the cross-linguistic difference. We conjecture that different magnitudes of jaw movements across the two groups of speakers cause the difference in the lower boundary of the vowel height dimension. Interestingly, we find that female speakers seemingly contribute more than male speakers in the interdialectal difference in vowel space usage.

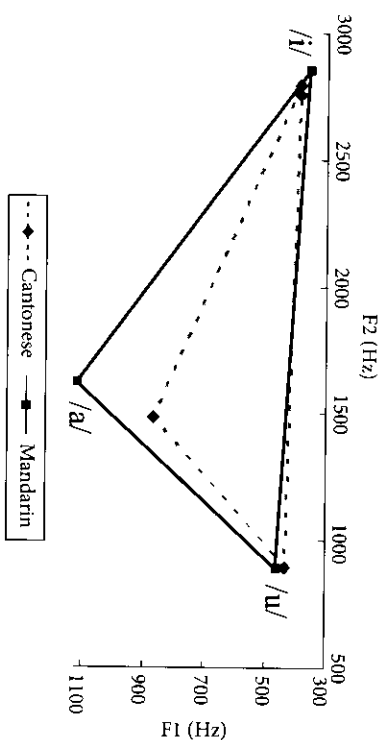


FIGURE 34.4 Vowel triangle comparison between Cantonese and Mandarin (averaged over male and female subjects)

Table 34.9 Statistical analysis results comparing vowel triangle areas between Cantonese and Mandarin

| area | F_1 (i) | F_2 (i) | F_1 (a) | F_2 (a) | F_1 (u) | F_2 (u) |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Cantonese | 343343 | 351 | 2477 | 813 | 1342 | 411 |
| Mandarin | 518657 | 330 | 2546 | 985 | 1454 | 427 |
| $F(1,142)$ | =50.9 | =8.974 | =1.704 | =74.6 | =14.7 | =4.6 |
| p | <0.001 | <0.003 | =0.194 | <0.001 | <0.001 | <0.034 |
| | | | | | | =0.098 |

The phonological structure of Cantonese, in terms of its inventory size of tones and ending consonants, allows more syllable combinations than that of Mandarin. The consequent comparative scarcity of contrasts in Mandarin (Mandarin has a similar number of vowels to Cantonese but larger acoustic space) was conjectured to lead to some possible compensatory mechanisms in order to maintain a number of lexical contrasts largely consistent with other dialects/languages. The current cross-dialectal difference in vowel space seems to play such a role: with vowels with larger intercategory acoustic space, the perceptual contrasts contributed by Mandarin vowels are stronger than Cantonese. This is an interesting point that merits further examination.

Another cross-dialectal difference can be found by examining the vowel distributions of both dialects on the vowel triangles, as shown in Figure 34.2. There is a noticeable difference between them: Cantonese makes full use of the lower two boundaries of the vowel triangle, while there is no high mid vowel. Mandarin vowels occupy both the top and the lower right boundaries, while leaving the lower left boundaries virtually empty by having no mid-height front vowel. There is a front mid vowel / ϵ / used only as an interjection in Mandarin. Since the current Mandarin corpus contains only read

sentences, no token of such mid-height front vowel is available, leaving the observed "hole" in the vowel space. Apart from this artifact, other discrepancies in vowel distribution may be due to divergence in vowel development of the two dialects. However, meaningful results can be obtained only after careful mapping analysis between individual characters in these two contemporary dialects, which is obviously beyond the scope of the current chapter.

34.4.5 Summary

In summary, this chapter helps to better understand vowel production in different situations. In addition to isolated syllables, the continuous speech corpora currently used have a large variety of utterances, in which many features of continuous speech are present. However, since the sentence production was recorded in the laboratory, it is essentially free of noise although it still lacks many features of spontaneous speech such as hesitation, interruption, pause, and so on. Nonetheless, the current acoustic analysis can be treated as an intermediate step before future acoustic analyses on recordings of daily conversational speech.

Moreover, the continuous speech data were completely segmented by computer program, unlike many previous studies using manually segmented data. The advantage of this method is that huge amounts of data can be used. The weakness is that computer programs cannot guarantee that the segmentation is performed exactly as phoneticians would do. Furthermore, the continuous speech corpora used here are not balanced in CV, VC, or vowel tone combinations. Consequently, many interesting linguistic phenomena, such as intrinsic fundamental frequency and influence of consonant context on formant frequencies, cannot be examined here. However, the errors from computer programs are quite consistent because they segment speech based on statistical properties of speech units. Therefore, such errors might be minimized by averaging. Since the vowel analysis for continuous speech was based on a large number of vowel tokens and a large number of speakers, the results of such analysis can be used to build models for speech synthesis or automatic speech recognition, serving as a bridge between linguistic knowledge and speech technologies.

ACKNOWLEDGMENTS

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FURTHER READING

For more on acoustic phonetics, see Lehiste (1967) for a collection of classical articles including Peterson and Barney (1952), and see Stevens (1998) for a systematic theory of speech production in the human vocal system.

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CHAPTER 35

MODERN CHINESE
PHONOLOGY

LIAN-HEE WEE AND MINGXING LI

35.1 INTRODUCTION

The Chinese language, a cover term including all languages of Han 汉 descent, is arguably not a single language at all, especially in the area of phonology where mutual intelligibility is sometimes non-existent.¹ Despite wide variation, there are aspects of phonology that characterize Modern Chinese languages: the Chinese syllable has a very limited size, never larger than four segments, within which segmental alternations may involve allophony between vowels and consonants. Depending on whether one takes a diachronic or a synchronic view, analyses of the segments may yield different conclusions of the Chinese phonemic inventory (Chao 1934).²

Chinese is also special in being tonal and can be described by assigning to each syllable numerical values of Chao's (1930) design. Eventually Wang (1967) provided a more abstract tone feature system facilitating deeper analyses. The analytical strands for syllable, segment, and tone came together later in theoretical works such as Cheng (1968, 1973). From here the path to the 21st century was laid with research on the configuration of Chinese syllables (Lin 1989; Duanmu 2007, inter alia) and intricacies on the treatment of tone patterns (Shih 1986; Chen 2000; Wee 2004, inter alia).

Informed by a background of theoretical phonology, this chapter offers a synchronic view through three cascading windows of research in Modern Chinese phonology: (i) syllable structure, (ii) allophony, and (iii) tone.

35.2 THE CHINESE SYLLABLE

35.2.1 Structure of the Chinese Syllable

Despite the multiplicity of modern Chinese languages (inclusive of Standard Chinese³ and the regional dialects), the Chinese syllable is never larger than four segments, as shown in (1).

(1) Sample of syllables across dialects

| | Beijing 北京 | Suzhou 苏州 | Fuzhou 福州 | Cantonese 广州 |
|------|---------------|--------------|--------------|-----------------|
| V | 阿 [a] | 安 [ə] | 阿 [a] | 丫 [a] |
| CV | 打 [ta] | 担 [te] | 家 [ka] | 花 [fa] |
| CVC | 担 [tan] | 张 [zan] | 斤 [kyn] | 驳 [pok] |
| CVG | 到 [tau] | 多 [tau] | 交 [kau] | 教 [kau] |
| CGV | 瓜 [kua] | 写 [sia] | 爹 [te] | - ^a |
| CGVC | 酸 [suan] | 详 [zian] | 半 [puan] | - |
| CGVG | 吊 [tiau] | - | 娇 [kieu] | - |

Note: C = consonant; V = vowel; G = glide. Glides are close vowels (i.e. /i, u, y, w/) that are not nucleic.

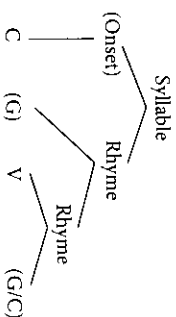
^aFollowing Bauer and Benedict (1997:314ff) and Zee (1999), the labiality is part of the coarticulation of the consonant in Cantonese syllables like [kwa]. Source: Adapted from Lin and Wang (1992:102-103).

As shown in (1), the Chinese syllable allows combinations of consonants (C), vowels (V), and glides (G) up to a maximum of four, though some dialects (e.g., Cantonese) allow fewer. In all cases, V is most sonorant and obligatory.

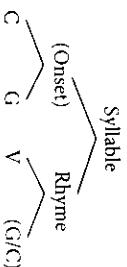
Cases like Cantonese have a relatively uncontroversial syllable structure. The initial C is onset, while the remaining segments comprise the rhyme (i.e., [onset C [rhyme V X]]).⁴ For languages with the medial G, there are two main schools of thought.

(2) Competing Models of the same Chinese Syllable⁵

(a) Traditional (Wang 1957; Cheng 1966; Cheng 1973; Lin 1989)



(b) Medial Glide as Part of Onset (Firth & Rogers 1937; Duanmu 1990, 2007)



In (2), optional elements are indicated within brackets. Both models agree that the rhyme consists of V + G/C, with evidence mostly from rhyming. In Standard Chinese for example, *gao* 高 [kau] 'tall' rhymes with *biao* 镖 [piau] 'dart', suggesting that [au] is the rhyming unit. Otherwise, the traditional model is built on the fact that Middle Chinese classifies syllables in terms of the *yinmu* 韵母 'rhyme'. More recently, Wee (2011) notes that many speakers of Standard Chinese feel that rhyming is stronger if GVX are identical across syllables than if only VX were identical (e.g. *diao* 雕 [tiau] 'carve' rhymes more strongly with *biao* [piau] 'dart' than with *gao* [kau] 'tall'), providing support for (2a).

Proponents of (2b) differ in whether CG form a single segment or as two different segments in the onset but agree in that the medial G is nearer to the onset C than V. Those who argue for treating CG as a singular segment (e.g. Duanmu 2007:77) cite evidence from phonetic length: CGVX and CVX are very similar in duration.

The controversy suggests that applicability of either model is language-specific (Chung 1989; Lin 1989:31–33; Bao 1990, 1999), and various authors have been careful to restrict their support for either model to specific dialects. However, the debate persists as arguments are often specifically about the Standard Chinese syllable. In this light, it might be prudent to note that Standard Chinese is spoken by diverse communities with different dialectal backgrounds.

35.2.2 Morphologically Licensed Syllables

While the CGVX restriction on Chinese syllables is generally correct, there are cases where morphological operations override this templatic constraint. For example, in Pingding 平定 the diminutive *-er* morpheme /l/ /l/ can be infix into the syllable (Xu 1981; Lin 1989:221), producing consonant clusters.

(3) Consonant clusters by morphology in Pingding

| | Stem | Stem + -er | gloss |
|----|------------|-------------|-------------|
| a. | 洞 tuəŋ | 洞儿 t[uaŋ] | 'hole' |
| b. | 树杈 su tʂʰa | 树杈儿 su tʂʰa | 'tree fork' |
| c. | 豆 tau | 豆儿 t[au] | 'bean' |

Such violations of the syllable template are uncommon and are necessarily licensed by morphological operations.

Similar licenses are sometimes found in syllable codas. In Standard Chinese, for example, coda consonants are necessarily /n, ŋ/, except with *-er*-affixation where [ɟ] is licensed. (4).

(4) [ɟ] coda in Standard Chinese⁶

| | Stem | Stem + -er | gloss |
|------|-----------|------------|---------------|
| i. | 尖 [tɕien] | 尖儿 [tɕieɟ] | 'sharp point' |
| ii. | 马 [ma] | 马儿 [maɟ] | 'horse' |
| iii. | 段 [tuan] | 段儿 [tuaɟ] | 'segment' |

35.3 SEGMENTAL ALTERNATIONS

Segments in Chinese often undergo alternation. This section presents two of the most researched aspects of such allophony.

35.3.1 Mid-Vowel Alternations

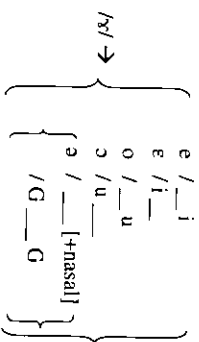
Mid-vowels [o, ɔ, e, ɛ, ə] typically occupy the V position in the Chinese syllable by virtue of their higher sonority. Various allophonic patterns are observed between these vowels. Standard Chinese exhibits a particularly intricate pattern: [e, ɛ] is always adjacent to [i]; [o, ɔ] to [u]; [ə] to a nasal coda or between Gs; and [ɻ] is always the sole rhyme element.

(5) Complementary distribution of Standard Chinese mid-vowels

| a. | [e, ɛ] | Unattested forms |
|------|-----------------------------------|---------------------------------|
| i. | <i>lei</i> 累 [lei] 'tired' | *[leu], *[lue], *[len], *[le] |
| ii. | <i>lie</i> 裂 [lie] 'crack' | *[lue], *[leu], *[len], *[le] |
| iii. | <i>mei</i> 妹 [mei] 'sister' | *[meu], *[mue], *[men], *[me] |
| iv. | <i>mie</i> 灭 [mie] 'extinguish' | *[mue], *[meu], *[men], *[me] |
| b. | [o, ɔ] | |
| i. | <i>mou</i> 谋 [mou] 'plan' | *[moi], *[mio], *[mon], *[mo] |
| ii. | <i>mo</i> 磨 [mu] 'grind' | *[mic], *[moi], *[mon], *[mo] |
| iii. | <i>gou</i> 够 [kou] 'enough' | *[koi], [kio], [kon], [ko] |
| iv. | <i>guo</i> 过 [kuo] 'over' | *[kio], *[koi], [kon], [ko] |
| c. | [ə] | |
| i. | <i>leng</i> 愣 [lən] 'stupidified' | *[lei], *[leu], [lie], [lue] |
| ii. | <i>men</i> 闷 [mən] 'bored' | *[mei], *[meu], *[mie], *[mue] |
| iii. | <i>geng</i> 更 [kən] 'more X' | *[kai], [kau], [kia], [kua] |
| iv. | <i>gui</i> 归 [kuei] 'return' | *[kuoi], [kuei], [kuai], [kuei] |
| d. | [ɻ] | |
| i. | <i>le</i> 乐 [ɻ] 'joy' | *[le], *[le], [lo], [lo] |
| ii. | <i>ge</i> 各 [kɻ] 'each' | *[ke], [ke], [ko], [ko] |

The patterns in (5) may be formalized as (6), where all mid-vowels are assumed to be underlyingly /s/ surfacing in different forms depending on the environment.

(6) Mid-vowel alternations in Standard Chinese (adapted from Cheng 1973:18)



The formalism in (6) states that /y/ becomes [e] when followed by [i], [e] when preceded by [i], [o] when followed by [u], and so on. These essentially summarize the data in (5). Mid-vowel alternations are also found in Cantonese (Chao 1947), Changsha 长沙, and Suzhou 苏州 (Yuan 2001).

35.3.2 Complex Complementarity

Beyond the mid-vowels, complex complementarity is found in Standard Chinese between the high vowel [i], alveolar [ʃ], and retroflex [ʒ] (the latter two collectively referred to as apicals, often represented as ɿ and ʝ respectively),⁷ first discussed in Hartman (1944) and summarized in the following.

(7) Onset compatibility with various rhymes in Standard Chinese

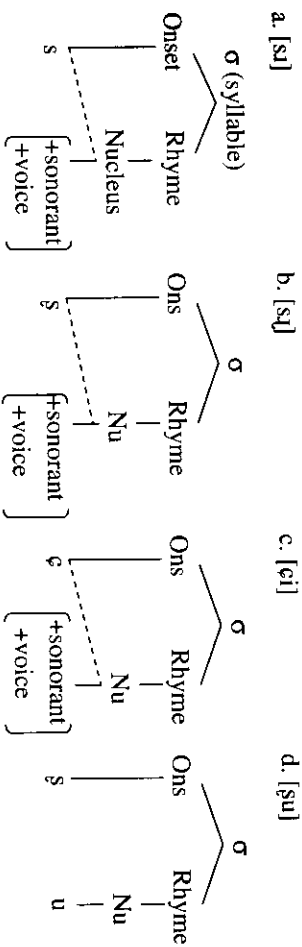
| | rhymes beginning with | | | | |
|---|-----------------------|-----|-----|-----|--------------|
| onsets | [i] | [ɿ] | [ɿ] | [y] | [u, e, o, a] |
| Palatal sibilants [ʃ, tʃ, tʃʰ] ⁸ | ✓ | * | * | ✓ | * |
| Retroflex sibilants [ʒ, tʂ, tʂʰ] | * | * | ✓ | * | ✓ |
| Alveolar sibilants [s, ts, tsʰ] | * | ✓ | * | * | ✓ |
| Velar obstruents [k, kʰ, x] | * | * | * | * | ✓ |

In (7), palatal consonants appear to be compatible only with [i, y], while the retroflex and alveolar ones may take either [u, e, o, a] or a homorganic apical. From this perspective, one may conclude that [i, ɿ, ʝ] are allophonic and vary depending on the preceding onset consonant, while [y] is a separate phoneme by its contrast with [i].

However, if (7) is studied from the perspective of the consonants, the palatals are complementary with the other consonants and may be treated as underlyingly the same with either the retroflex, alveolar, or velar sets.⁹ Thus one arrives at a dilemma where the determination of the underlying form of [i, ɿ, ʝ] depends on the onset consonant but the underlying form of the onset consonants can only be determined from [i, ɿ, ʝ].

Lin (2007:169f) suggests that [ɿ, ʝ] derive from the spreading of the alveolar or retroflex feature as illustrated in (8a) and (8b), an analysis we extrapolate to (8c).

(8) Deriving the apical and palatal vocoids



In (8a) through (8c), the nuclei are only specified as voiced sonorants. Spreading (i.e., assimilation, indicated with dashed lines) from the preceding segment makes the nucleus alveolar or retroflex. This explains why the vowel and the preceding sibilant have similar places of articulation. In (8d), the vowel is fully specified (corresponding to the final column in (7)) and requires no spreading. Lin's solution eliminates the need to postulate an underlying phoneme for [ɿ] and [ʝ] and leaves the complementarity of the onset sibilants (particularly between the velars and the palatals in (7)) as the missing jigsaw piece.

Apicals thus continue to be a major topic of interest in the study of Modern Chinese segmental phonology. Of the 124 surveyed in Li (2011: appendix II, III), 61 involve complementarity between apicals and [i] (e.g., Dayu 大余, Ledu 乐都, Lanzhou 兰州), 38 contrasts the apicals with [ɿ] (e.g., Huiyang 惠阳, Yugan 余干, Juxian 歙县), and 25 do not have apicals (e.g., Chenghai 澄海, Jiangyong 江永).

35.4 THE PHONOLOGY OF TONE

Of all phonological characteristics of Modern Chinese, tone is perhaps most distinctive (see chapter 37 in this volume). Modern Chinese tonology falls mostly on the representation of tone and tonal sandhi (alternation).¹⁰

35.4.1 Representation of Tone

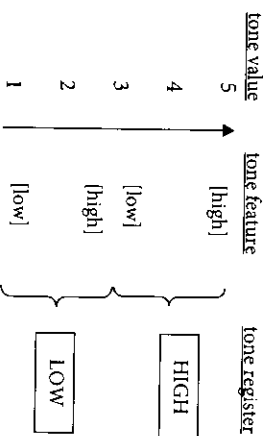
Chao (1930) made the earliest proposal for tonal representation, using numerical values [1] to represent the lowest pitch and [5] the highest. Hence, level or contour tones may be represented as a sequence of numbers, exemplified with Taiwanese Min 台语 in the following.

(9) Examples of Taiwanese Min Tones

| Contour description | Tone Value | Example |
|---------------------|------------|--------------------------------|
| High level | [55] | 詩 [sɿ ⁵⁵] 'poetry' |
| Low rising | [24] | 時 [sɿ ²⁴] 'time' |
| Full/high falling | [51] | 死 [sɿ ⁵¹] 'die' |
| Low falling | [21] | 四 [sɿ ²¹] 'four' |
| Mid level | [33] | 寺 [sɿ ³³] 'temple' |

Though Chao's system is insightful and handy, free combination of tone values yields many possibilities (25 with two numbers and 125 with three), but no singular Chinese language is known to make more than ten tonal distinctions. Wang (1967) offers tonal features [contour, high, central, mid, rising, falling, convex], which effectively limit the possibilities of tone contrasts within a single language. Building on the foundations of Wang (1967), Woo (1969) suggests contours be interpreted as a sequence of [high] and [low] features. Together with Yip's (1980) register features, four distinct tone levels may be captured, as shown in (10).¹¹

(10) From tone values to tone features



The Taiwanese Min tones could then be represented as in Table 35.1, where the capital [H] and [L] represents register, while the lowercase letters [h] and [l] represent contour features. Falling and rising tones would be [hl] and [lh] respectively.

Table 35.1 Taiwanese Min tones in register and tonal features

| Category | Register and Contour | Tone Value | Example |
|--------------|----------------------|------------|--------------------------------|
| Yin Ping 阴平 | [H, h] | [55] | 詩 [sɿ ⁵⁵] 'poetry' |
| Yang Ping 阳平 | [L, lh] | [24] | 時 [sɿ ²⁴] 'time' |
| Shang 上 | [H, hl] | [51] | 死 [sɿ ⁵¹] 'die' |
| Yin Qu 阴去 | [L, hl] | [21] | 四 [sɿ ²¹] 'four' |
| Yang Qu 阳去 | [L, h] | [33] | 寺 [sɿ ³³] 'temple' |

The featural representation of tone brought about much insight to the study of tone sandhi, as will become evident in the ensuing paragraphs.

35.4.2 Tone Sandhi

Tones undergo alternation (sandhi) in many Chinese languages. The most famous example is the third tone sandhi of Standard Chinese, which has four lexical tones. Adjacency of two syllables bearing the third tone [214] trigger sandhi so that the first syllable becomes [35], shown in (11).

(11) a. Lexical Tones in Standard Chinese

| Tone Value | Example: fen |
|--------------|---------------|
| Tone 1 [55] | 芬 'fragrance' |
| Tone 2 [35] | 坟 'tomb' |
| Tone 3 [214] | 粉 'powder' |
| Tone 4 [51] | 粪 'excrement' |

b. Third-tone sandhi in Standard Chinese

- i. [T₃ 214] + [T₃ 214] → [T₂ 35] + [T₃ 214]
fen + chang → fen.chang 粉厂
'powder' 'factory' 'flour mill'
- ii. [T₃ 35] + [T₃ 214]
fen + chang → fen.chang 坟场
'tomb' 'yard' 'cemetery'

The sandhied form of 粉厂 'flour mill' (11b) is indistinguishable from 坟场 'cemetery', hence sandhi is tone category-shifting, neutralizing underlying contrasts. This was first experimentally demonstrated by Wang and Li (1967) and has since been the inspiration of many such experimental studies, see chapters 34 and 37 in this volume.

35.4.2.1 Chain-Shifting with Register and Contour

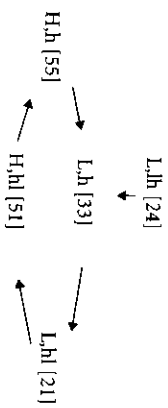
Moving on with the patterns of tone sandhi, recall Taiwanese Min. In Min 閩 languages (Xiamen 廈門, Chaozhou 潮州, Hainan 海南, etc.), the tone of a syllable varies depending on whether it is the final of a string of syllables in a tone group partially determined by syntactic phrase structure (Cheng 1968, 1973; Chen 1987). Thus the examples given in Table 35.1 take on different tones when followed by another syllable, illustrated in (12).¹²

(12) Tone Group Final

- | | |
|--|---|
| a. 有时 [u sɿ ²⁴] 'sometimes' | 时间 [sɿ ³³ kan] 'time' |
| b. 少林寺 [siao lim sɿ ³³] 'Shaolin Temple' | 寺庙 [sɿ ²¹ bio] 'temple' |
| c. 第四 [te sɿ ²¹] 'fourth' | 四支 [sɿ ⁵¹ ki] 'four sticks of' |
| d. 去死 [kʰi sɿ ⁵¹] 'go die (go to hell)' | 死人 [sɿ ⁵⁵ lan] 'dead person' |
| e. 背诗 [pue sɿ ⁵⁵] 'memorize poetry' | 诗人 [sɿ ³³ dzin] 'poet' |

In (12), the first column shows the citation tones (cf. Table 35.1), the item under examination in *italics>*. The second column shows the tone sandhi when the syllable is in a non-final position. The careful reader might notice that in (12a), [24] → [33], and in (12b), [33] → [21], creating a chain-shift. In fact, when all the tones in Table 35.1 are considered, a circle of shifts would be observed.

(13) Min Tone Circle (Taiwanese)



Looking at the tone values, it is hard to discern any pattern in [24] → [33] → [21] → [51] → [55] → [33]. However, when transcribed as register and the contour features, a pattern emerges: In each change, either the register alternates (from L → H or H → L) or the contour alternates (from h → hl or hl → h), but there are no instances where both register and contour alternate (Wang 1967).

The usefulness of construing tones as being composite of register and contour features is also exemplified in Pingyao 平遥 where the register of an initial syllable assimilates to that of the following one (Hou 1980, cited in Yip 1995).

(14) Tone Sandhi in Pingyao

- a. 13 → 35 / __ 53 (or L,h → H,lh / __ H,h)
- b. 35 → 13 / __ 13 (or H,lh → L,h / __ L,h)

A close look at (14) reveals that the contour retains its rising shape but is shifted in its entirety to a higher or lower range in agreement with the register of the following tone.

35.4.2.2 Directionality

Tone sandhi application also exhibits directionality effects, as shall be seen in the Mandarin dialect of Tianjin 天津. The basic tonal facts of Tianjin are given in the following.

(15) Tianjin tones and tone sandhi

a. Inventory of Tianjin Lexical Tones

| | Description | Tone value | Standard Chinese |
|--------|-----------------------------------|------------|------------------|
| | (Yip 1989; Chen 2000; Wang 2002b) | Shi (1990) | cognate |
| Tone 1 | Low level [l] | [11] | High level [55] |
| Tone 2 | High level [h] | [55] | Rising [35] |
| Tone 3 | Rising [lh] | [24] | Dipping [214] |
| Tone 4 | Falling [hl] | [53] | Falling [51] |

b. Rudimentary Sandhi Patterns

- i. ll → lh.l
e.g. *fei ji* 飞机 'fly machine (=airplane)'
kai che 开车 'drive car'
- ii. lh.lh → h.lh
e.g. *zong li* 总理 'overall manage (=prime minister)'
xuan ju 选举 'select support (=election)'
- iii. hl.hl → lh.l
e.g. *fu gui* 富贵 'prosperity expensive (=prosperous)'
shi jie 世界 'world domain (=world)'
- iv. hl.l → h.l
e.g. *si fang* 四方 'four square (=square)'
- v. lh.hl → lh.l
e.g. *ban deng* 板凳 'board chair (=bench)'
shou duan 手段 'hand segment (=methods, means)'
- vi. lh.h → lh
e.g. *zhao qian* 找钱 'find money (=give change)'
zhu ren 主人 'master person (=master/mistress)'

Hung (1987) and Yip (1989) were among the first to point out that the tone sandhi in Tianjin is triggered by a ban against adjacency of identical tone contours (ll, lh.lh, hl.hl, cf. (15bi–15biii)). Later, Wee (2004, following Chen 2000:110) extended the idea to cover (15biv–15vi) as a ban against adjacency of identical tone features.¹³

In longer Tianjin tonal strings, sandhi applies either rightward or leftward, as (16) shows.

(16) Directionality in Tianjin Tone Sandhi

a. /hl.hl/ → lh.l

- Derivation: rightward e.g. *si ji qing* 四季青 'evergreen'
hl.hl ↓ *zuo dian che* 'take a tram'
lh.l ↓ *si si san* 四四三 'four four three'

lh.l

b. /lh.lh.lh./ → h.h.lh

Derivation: rightward

e.g.

li fa suo 理发所 'barber shop'lh.lh.lh*mu lao hu* 母老虎 'tigress'

↓

ma zu ka 马祖卡 'Marzuka'h.lh.lh

↓

h.h.lh

c. /hl.hhl./ → h.l.hl.

Derivation: leftward

e.g.

su liao bu 塑料布 'plastic cloth'hl.hhl*ya re dai* 亚热带 'subtropics'

↓

yi da li 意大利 'Italy'hl.l.hl

↓

h.l.hl

d. /lh.lh.l/ → h.lh.l

Derivation: leftward

e.g.

bao wen bei 保温杯 'thermos cup'lh.lh.l*da guan qiang* 打官腔 'speak in a bureaucratic tone'

↓

ma la song 马拉松 'marathon'lh.lh.l

↓

h.lh.l

As may be seen in (16), the rudimentary ditonal sandhi rules move across the tritonal strings either rightward in (16a, 16b) or leftward in (16c, 16d). Further, the examples show that the direction of sandhi application persists despite morphosyntactic configurations.¹⁴

Effects of directionality are not unique to Tianjin but are also found in dialects like Boshan 博山 (Chen 2000:i:166f) and Changting Hakka 长汀客家 (Chen 2000:i:50ff; Chen et al. 2008).

35.4.2.3 Word-Level Tone

In some cases, tones appear to be assigned to the word rather than the syllable. For example, in New Chongming 新崇明, trisyllabic compounds are assigned a high tone to only one of the three syllables. The other syllables will remain phonologically toneless and get their pitch values by default assignment.

(17) Word level tones in New Chongming (from Chen 2000:227)

a. [*xin zang*] *bing* e.g. 心脏病 'heart disease'

h l,hl l,h base tones

h ∅ ∅ sandhied tones

b. [*za huo*] *dian* e.g. 杂货店 'grocery store'

l H,lh H,lh base tones

∅ h ∅ sandhied tones

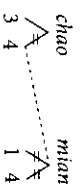
c. *chiu* [*feng tou*] e.g. 出风头 'to seek the limelight'

h h l base tones

∅ ∅ h sandhied tones

In (17), each isolated syllable has a tone. When compounded, however, the individual tones are lost, instead a [h] tone is assigned to one of them while the other two syllables remain toneless. These toneless syllables are given default mid-level tones if preceding the assigned [h] or a low and slightly falling one if following the assigned [h]. Shanghai 上海 exhibits word-level tones as well (18).

(18) Word level tone in Shanghai

*chao*³⁴ *mian*¹⁴ → *chao*³³ *mian*⁴⁴ 炒面 'stir-fried noodles'

In (18), the tone [14] of the second syllable is deleted, followed by the reassociation of the initial tone [34] to both syllables. Consequently the tone [34] is for the compound word *chao mian*.¹⁵

Word-level tone is also found in a number of dialects, particularly from the Wu 吴 family (e.g., Wenzhou 温州, Suzhou 苏州). These patterns led Shih (1986) to compare them with African tonal systems, and echoes have been reported in the Hong Kong variety of English (Cheung 2009) and Singapore English (Wee 2008), both with evident Chinese heritage.

35.4.3 Neutral Tones

The cases of New Chongming and Shanghai bring our attention to the issue of tonelessness, often described as syllables carrying neutral tones. Neutral tones inevitably involve morphological operations and are found particularly in Mandarin dialects such as Tianjin, Urumqi 乌鲁木齐, and Standard Chinese (see Wang 2002a for comparative treatment). In Standard Chinese, neutral tones come from three sources.

(19) Neutral tones in Standard Chinese

| a. By tonal deletion | | b. By suffixation | | c. From reduplication | |
|----------------------|--|--|----|---|----|
| Following | sheng ⁵⁵ qǐ ⁵¹ → ⁰ 生气 | lǎ ⁵⁵ mēn ²¹ | 他们 | ge ⁵⁵ ge ²¹ | 哥哥 |
| tone 1: | 'livelihood' | '3rd person + plural' | | 'older brother' | |
| Following | neng ⁵⁵ nài ⁵¹ → ⁰ 能耐 | chá ⁵⁵ e ²¹ | 查了 | niang ⁵⁵ niang ²¹ | 姑娘 |
| tone 2: | 'capability' | 'check + perfective aspect' | | 'your ladyship' | |
| Following | ěr ²¹ duō ²¹⁴ → ⁰ 耳朵 | mǎi ²¹ e ²¹ | 买了 | jiē ²¹ jiē ²¹ | 姐姐 |
| tone 3: | 'ear' | 'buy + perfective aspect' | | 'older sister' | |
| Following | lǐ ⁵¹ xī ⁵⁵ → ⁰ 利息 | fàng ⁵¹ zhe ²¹ | 放着 | dì ⁵¹ dì ²¹ | 弟弟 |
| tone 4: | 'interest' | 'place + progressive aspect' | | 'younger brother' | |

In (19a), the tone of the second syllable is deleted and a neutral tone assigned to its place, indicated by the arrow →. The value of the neutral tone is determined by the tone of the preceding syllable. The change is often accompanied by a change in lexical category or semantic meaning. For example, the first item for (19a) means 'to be angry' if the second syllable keeps its original tone. In (19b) the various suffixes are indicated in the glosses. In (19c), reduplicants do not take the tone of the base form but carry neutral tones. In all cases, the neutral tone value is entirely predictable: [low] following all other tones except after the third tone [21/214] where it is [high].

35.5 CONCLUSION

To conclude, this chapter has explored three main aspects of Modern Chinese phonology: syllable structure, allophony, and tone. It is impossible to do justice to all the topics covered since the 1930s when linguistic theories of the West enriched the study of Chinese languages. However, the overview here hopes to offer a glimpse of some key phenomena that have captivated researchers in this area.

ACKNOWLEDGEMENTS

The authors extend their gratitude to the editors, especially Prof. William Wang who gave us much direction on the scope and depth suitable for this chapter. The research is supported by FRG2/10-11/074 from the Hong Kong Baptist University.

NOTES

1. Vastness of space across which migrations within and without Chinese borders took place and the time elapsed since Old Chinese and Middle Chinese inevitably spawned the many Modern Chinese dialects (see chapters 2, 6, and 11 in this volume).
2. On this foundation, Hartman (1944) and Hockett (1947, 1950) described almost exhaustively the phonological patterns of the Beijing dialect.
3. Also known as Putonghua 普通话, Standard Mandarin, or Beijing Mandarin.
4. X indicates a glide, nasal or stop.
5. Although some analysts adopt a moraic model (Wang 1993; Ma 2003:63–67, *inter alia*), the insights and issues presented herein remain unchanged.
6. *-Er* suffix 儿 has been transcribed as [ɤ] or [ɨ] (Lin 2007:184), though to the best that we can determine, it is a retroflex.
7. Apicals, technically consonants, are common in Chinese languages and may serve as syllabic nuclei, thus sometimes called "apical vowels" (Ladefoged and Maddieson 1990:93f).
8. These are alveolo-palatal consonants, though Lee and Zee (2003) transcribe them as [tʃ, tʃʰ, tʃʰ]. Our transcriptions follow Chao (1968:22), Ladefoged and Wu (1984), and Ladefoged and Maddieson (1996:91).
9. Historically the palatals consonants relate partially to the velars and partially to the alveolars/dentals and may need separate treatment (Cheng 1968). However, the historical source does not necessarily argue for underlying identity from a synchronic perspective, a point Chao (1934) insightfully made.
10. Classical studies center on the categories of Ping, Shang, Qu, Ru, and their Yin and Yang registers.
11. In Yip's (1980) original work, the register feature was [+UPPER].
12. Many thanks to Xuwen Lai for checking the accuracy of the data.
13. Known in theoretical phonology as the Obligatory Contour Principle (Leben 1973).
14. Each tritonal string is accompanied by examples of different morphosyntactic configuration: left-branching, right-branching, and flat, respectively.
15. See Zhu (2006) for details and complications.

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CHAPTER 36

INTONATION IN CHINESE

Y I X U

INTONATION refers to fundamental frequency (F_0) patterns in speech that convey information beyond lexical meanings. In a tone language, F_0 is already used to represent lexical tones. An obvious question is therefore how it is possible for it to also carry intonation. A widespread idea is that the coexistence of tone and intonation in a tone language is possible because tones are like small ripples riding on large intonation waves (Chao 1968). This chapter summarizes the scientific findings that, though consistent with this view, show specific mechanisms that make it possible for tone and intonation to coexist. Importantly, these findings have shown that an adequate understanding of intonation is achievable only if we take into account two complementary aspects of speech: *articulatory mechanisms* and *communicative functions*. The chapter first outlines the basic mechanisms of pitch production, which serves as the basis of explaining how intonational melody can be realized in parallel with tones. The intonational components are then introduced in terms of their functions with specific communicative meanings, which include focus, sentence modality, topic, turn taking, and boundary marking. The relation between these functions and the often-reported phenomena of declination, downstep, and rhythm are also discussed.

36.1 TONAL MECHANISMS

F_0 is produced by the vibration of the vocal folds. The rate of this vibration is determined jointly by the tension of the vocal folds and subglottal pressure (Titze 1989). The former is mainly controlled by the intrinsic and extrinsic laryngeal muscles and the latter by the abdominal muscles and the diaphragm in conjunction with the laryngeal muscles (Zemlin 1988; Titze 1989). A critical outcome of this complex control is the time course and dynamics of the resulting F_0 movements. Two patterns have emerged from empirical research. First, it takes a significant amount of time for a speaker to make even the smallest pitch shift, and the time needed increases quasi-linearly with the size of

pitch change, as represented by the following equations based on data from Xu and Sun (2002):

$$t = 89.6 + 8.7d \quad (\text{raising}) \quad [1]$$

$$t = 100.4 + 5.8d \quad (\text{lowering}) \quad [2]$$

where t is the amount of time (millisecond [ms]) it takes for an average speaker to complete an F_0 movement and d the size of the F_0 movement in semitones ($st = 12 \cdot \log_2(F_0 / F_{\text{reference}})$). According to [1] and [2], it takes about 124 ms to either raise or lower pitch by 4 st. In continuous speech, the difference between two adjacent tones is often close to or greater than 4 st (Xu 1997, 1999). On the other hand, the duration of a syllable is very short when compared to the minimum time needed to make the tonal transitions. In Mandarin, for example, the average syllable duration is about 180 to 215 ms (Duannu 1994; Xu 1999). This means that to make a shift between two adjacent tones, a time period greater than half of a syllable has to be used just for making the transition even if the maximum speed of pitch change is achieved.

The second pattern emerging from empirical research is that the transition toward each tonal target occurs *within* the tone-bearing syllable itself (Xu 1997) rather than in a temporal interval *between* adjacent tones (Ladd 2008). Combined with the relatively slow F_0 movements, the F_0 of an entire syllable constitutes a continuous transition toward an ideal pitch pattern of the tone, as shown in Figure 36.1.

These findings suggest that *syllable-synchronized sequential target approximation* is the basic mechanism of tone articulation, as summarized by the Target Approximation (TA) model (Xu and Wang 2001) illustrated in Figure 36.2. Under the TA model, pitch targets serve as *melodic segments* whose presence and implementation are mandatory (i.e., required whether or not the language is tonal). On the other hand, various aspects of the target approximation process can be adjusted, and the adjustments can determine additional details of the surface F_0 contours. At least four aspects of the target approximation process, including the targets themselves, can be identified: (i) pitch target (specified in terms of slope and height), (ii) strength (rate of target approximation), (iii) pitch range (height and span), and (iv) syllable duration. The impact of modifying each of the four parameters can be seen in Figure 36.2.

36.1.1 Tonal Pitch Range versus Total Pitch Range

A relevant question about the possibility of using pitch range to represent information beyond lexical tones is whether there is actually sufficient extra pitch range available for this purpose. The question is important given that when describing lexical tones, it is often assumed that tones take up "the range of a speaker's voice" (Chao 1968:25). In Chao's 5-point scale system, for example, Tone 1 (high-level) in Mandarin is at the

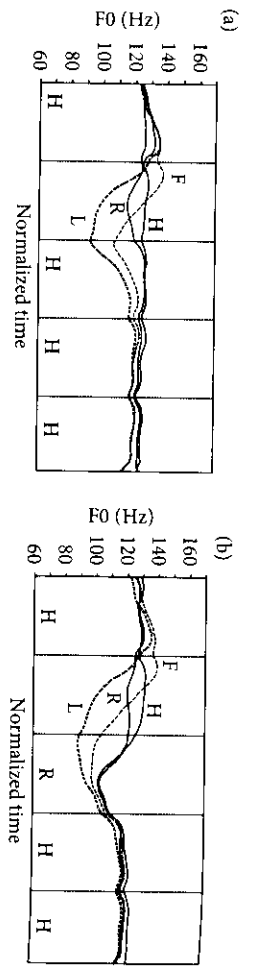


FIGURE 36.1 Mean time-normalized F_0 contours of 猫咪/迷/米/蜜/摸/拿/卖猫咪 [Kitty/Cat-fan/Cat rice/Cat honey stroke/pick up/sell kitty] produced by four males speakers of Beijing Mandarin (Xu 1999). In all plots, vertical lines indicate syllable boundaries. Each contour is an average of forty tokens said by four male speakers of Beijing Mandarin (five repetitions by each). Adapted from Xu (1999).

top of the pitch range and Tone 3 (low-dipping) is at the bottom of the pitch range. Experimental data have shown that at any particular sentence position, the pitch range across the four Mandarin tones spans no more than one octave (1 octave = 12 semitones; Xu 1999). On the other hand, according to Fairbanks (1959), a speaker's conversational pitch range can span two octaves. According to Honorof and Whalen (2005), an average English-speaking male or female can produce a nonfalsetto voice covering a pitch span of as much as three octaves. Thus in a tone language like Mandarin, well over a full octave of the speakers' total pitch range, mostly in the upper region, is unused by lexical tones, hence available for other purposes. This suggests that there is actually plenty of room for F_0 to carry information beyond lexical tones.

36.2 INTONATIONAL FUNCTIONS

Articulatory mechanisms constitute only one of the two complementary aspects of intonation. The other aspect consists of communicative functions, that is, the information that is actually conveyed to the listener. Like lexical tone, which serves to distinguish words or syntactic categories, intonation consists of individual functions that each serve to mark a specific meaningful contrast. It is therefore important to identify them individually and to determine, in each case, the specific encoding schemes and the interactions between different functions. Based on the most up-to-date research, the

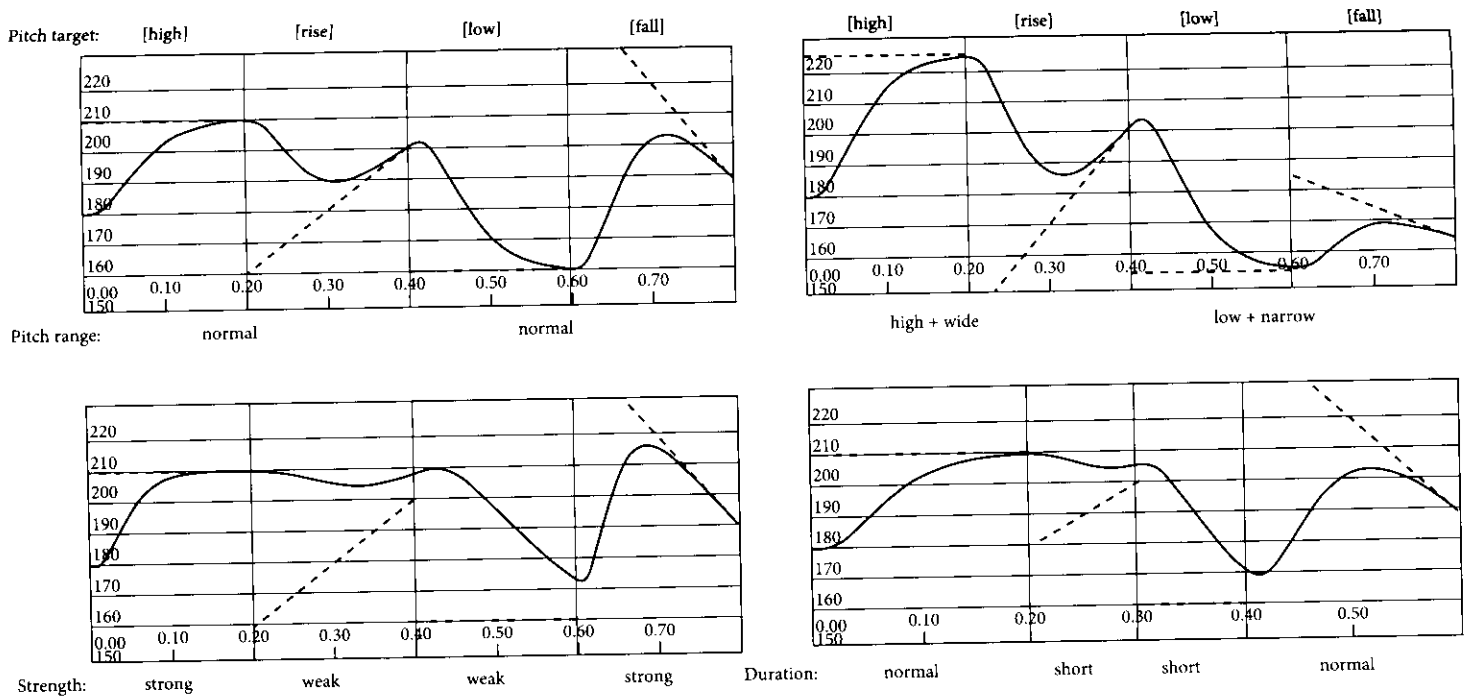


FIGURE 36.2 The TA model of tone production (Xu and Wang 2001), simulated by the qTA model (Prom-on et al. 2009). In all plots, vertical lines indicate syllable boundaries. The straight dashed lines represent pitch targets associated with lexical tones: static [high], dynamic [rise], static [low], and dynamic [fall]. The solid curves represent surface F_0 contours resulting from continuous articulatory approximation of successive pitch targets. The top left plot illustrates the case of normal lexical tone. The other three plots illustrate the effects of modifying pitch range, strength, and syllable duration, respectively. All the plots were generated by an interactive Java program accessible at <http://www.phon.ucl.ac.uk/home/yi/qTA/>.

intonational functions recognized for Chinese languages include focus, modality, topic, and boundary marking.

36.2.1 Focus

When the sentence 他 [he] 昨天 [yesterday] 走了 [left] [He left yesterday] is said as a response to the question 谁 [who] 昨天走了? [Who left yesterday?], the word 他 is naturally emphasized. When it is in response to 他什么时候 [when] 走了? [When did he leave?] or 他昨天怎么了 [what happened?], [What happened to him yesterday?], the focus would instead be on 昨天 or 走了. Such an emphasis, which highlights a particular component against the rest of the utterance, is known as *prosodic focus*, *narrow focus*, or simply *focus*. Prosodic focus has been extensively studied, and the emerging picture is that it is marked by a multitude of cues. In general, a focused component exhibits expanded pitch range, longer duration, greater intensity, and possibly increased high-frequency spectral energy (Cooper et al. 1985; Sluijter and van Heuven 1996; Xu 1999; de Jong 2004). Here pitch range expansion refers to the widening of the entire tonal pitch range, with the High tone becoming higher and the Low tone becoming lower. Furthermore, it is not just the focused component alone but also other parts of the sentence that are modified by the focal emphasis. In particular, the pitch range and intensity of the post-focus region are compressed (narrowed and lowered), hence, *post-focus compression* (PFC). But little is systematically changed in prefocus words. The asymmetrical pitch range change around focus can be seen in Figure 36.3b, where the High tone becomes higher and the Low tone becomes lower under focus, and all the postfocus tones become lower and reduced, as compared to the neutral focus F_0 contours in Figure 36.3a.

The identification of asymmetrical pitch range control by focus in Mandarin and English, in which the most notable feature is PFC, has led to a significant new development in intonation research. That is, PFC turns out to be nonuniversal, and it is unevenly distributed among the world languages (Xu 2011). Interestingly, this is even true of Chinese languages. For example, unlike Beijing Mandarin, Southern

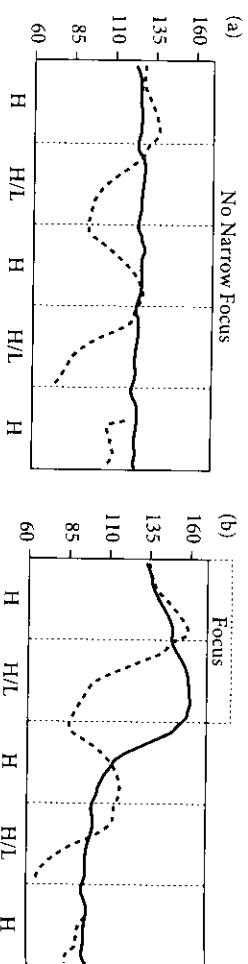


FIGURE 36.3 Mean time-normalized F_0 contours of 猫咪摸猫咪 [Kitty strokes kitty] (solid line) and 猫咪摸马刀 [Kitty strokes saber] (dotted line) with either no narrow focus (a) or focus on the first word (b). Each contour is an average of forty tokens said by four male speakers of Beijing Mandarin (five repetitions by each). Adapted from Xu (1999).

Min, Cantonese, and even Taiwan Mandarin (Mandarin spoken in Taiwan) all lack PFC (Xu et al. 2012). In addition, PFC is also absent in Yi, Deang, and Wa but present in Tibetan, Uygur, and Nanchang (Wang et al. 2011). More globally, there is initial evidence that PFC distribution correlates with language families. Among the PFC families are Indo-European, Uralic, and Altaic. The case of the Sino-Tibetan family is special, as PFC occurs in only some of the member languages (Beijing Mandarin, Tibetan, Nanchang) but is absent in others (Southern Min, Cantonese, Taiwan Mandarin). This may raise questions about the relation among these languages as well as their relation to other language families. A new area of research therefore seems to be emerging that may lead to rethinking about language typology, language change, and human evolution (Xu 2011).

36.2.2 Modality and Utterance Final Particles

Modality refers to whether an utterance is said as a statement or a question. This function is often marked morphosyntactically and in Chinese languages often by sentence-final particles (SFPs). In Mandarin, as in many other languages, a question is known to have a rising intonation toward the end of the utterance, whether or not a question particle is present. However, it is also known that in spontaneous speech even a syntactic question may not necessarily have a rising intonation and a syntactic statement may not have a falling intonation (Hirschberg 2000). Thus there are two separate issues about question intonation. One is *when exactly it occurs*, for which there is little consensus and therefore much more research is needed. The other is *what exactly happens* when it does occur, and this can be empirically studied. Interestingly, in an experimental recording session, a speaker would automatically use a rising intonation to read aloud a sentence with a question mark. This allows the use of systematic acoustic analysis to establish the prosodic details of question intonation. The general finding so far is that, at least in Mandarin, modality interacts extensively with focus to determine not only the utterance-final but also the entire F_0 contour of a sentence (Yuan 2004; Liu and Xu 2005). Figure 36.4 shows mean F_0 contours of a Mandarin question versus statement in sentences consisting of only the High tone. In Figure 36.4a, either focus is on the sentence-initial word or there is no narrow focus (hence, neutral focus). In Figure 36.4b, focus is either sentence-medial or sentence-final. It is apparent that the divergence between statement and question starts from the focused word rather than occurring only in the final word of the sentence or from the beginning of the sentence.

The F_0 patterns in Figure 36.4 also show that the pitch range adjustment by question intonation is a nonlinear function of time, with greater increase toward the end of the question. This nonlinearity is consistent with the general observation that the final raising is typically much more conspicuous than F_0 changes in earlier regions. But the interaction of modality with focus shows that the right edge of an utterance is not the only place where modality coding happens. This means that the notion of boundary tone (Perrehumbert 1980), which implies that final F_0 rise can exist by itself, is not accurate,

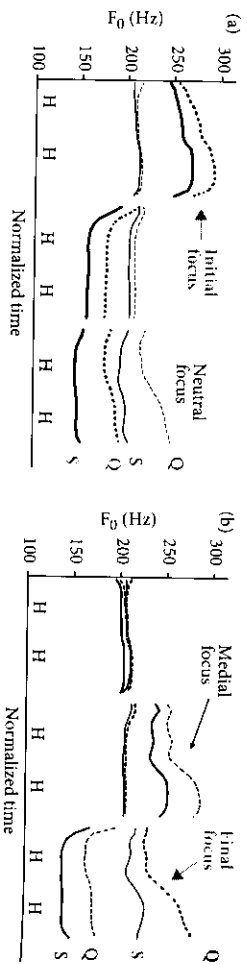


FIGURE 36.4 Mean F_0 contours of Mandarin sentence 张威 [Zhang Wei] 担心 [is concerned] 肖英 [Xiao Ying] 开车 [Driving] 发晕 [get dizzy] [Zhang Wei is concerned that Xiao Ying may get dizzy when driving] spoken as either a statement or a question. On the left, either focus is on the sentence initial word, or there is no narrow focus. On the right, focus is either sentence medial or sentence final. Data from Liu and Xu (2005).

because it is only part of the pitch range adjustment by modality, and additional adjustments are applied to other parts of the sentence, especially at the location of focus. Furthermore, the nonlinear adjustment of pitch range occurs not only in questions but also in statements, where F_0 is increasingly lowered toward the end of an utterance, resulting in the greatest drop in the final syllable. This final drop is observed as final lowering for English (Liberman and Pierrehumbert 1984).

The accelerating F_0 change found in Mandarin reflects the importance of sentence-final location for marking modality-related information. Beside question/statement contrast, other information can be encoded also at that location. This is reflected in the wide use of SFPs among the Chinese languages. One of the richest repertoires of SFPs can be found in Cantonese. A recent study has shown that Cantonese SFPs make use of a combination of lexical-tone-like F_0 contours and modality-relevant modifications such as question-like rise (Wu 2009). Also, some of the Cantonese SFPs exhibit an edge tone like component, which is sequentially attached to the end of the SFP by lengthening the rhyme without adding an extra syllable. Similar edge tones were noted in Mandarin by Chao (1968), who referred to them as particles. Only recently has there been some empirical research on the acoustic characteristics of this component (Mueller-Liu 2006; Li et al. 2011). More research is certainly needed.

36.2.3 New Topic (Topic Shift / Turn Taking)

When a sentence is the very first in a conversational turn or a read paragraph, its F_0 is raised, sometimes extensively, relative to other sentences (Lehiste 1975; Umeda 1982). The raising seems to affect the pitch range of an utterance nonlinearly, with a large F_0 raise near the beginning and a gradual drop afterward (Wang and Xu 2011). The gradual drop clearly separates topic from focus, which immediately lowers post-focus pitch range, as shown in Figure 36.3b. The communicative function of this initial F_0 raise is not yet fully clear. It has been described as marking a new paragraph (Lehiste 1975;

Tseng et al. 2005), introducing a new topic (Nakajima and Allen 1993; Wang and Xu 2011), or initiating a new conversational turn (Swerts 1997). Conceptually, topic seems to overlap with some other prosodic notions, particularly with focus and newness. The conceptual overlap with focus is the greatest in the case of contrastive topic, which is described as a topic that contains an alternative and marked by a rising accent in English (Büring 2003). So far, however, there have been no experimental data in support of a rising accent associated with contrastive topic in English. For Mandarin, a recent study has found no acoustic cue for the contrastiveness in a topic (Wang and Xu 2011). The same study has further found that after controlling for focus and topic, newness does not have intonational correlates except for a slightly lengthened duration (Wang and Xu 2011).

36.2.4 Boundary Marking

The importance of boundary marking is exemplified by the ancient punctuation story of 下雨天留客 天留我不留, which can be interpreted as either 下雨天 [A rainy day], 留客天 [is a day for keeping visitors], 天留我不留 [The weather keeps the visitor but I don't], or 下雨天 [A rainy day], 留客天 [is a day for keeping visitors], 天留我不 [Does the weather keep me? 留 [Yes]. In spoken language, such punctuation can be achieved through boundary marking by pausing. Pausing, however, does not always involve silence. Rather, domain-final lengthening can serve as a boundary marker. For English, it is shown that syllable duration alone can mark as many as seven grades of boundary strength (Wagner 2005). For Mandarin, domain-final lengthening is also consistently found (Tseng et al. 2005; Yuan et al. 2006; Xu and Wang 2009). A further question about boundary marking is whether it also involves other cues. There is some evidence that at least at the phrasal level, no direct F_0 marking is involved in Mandarin (Xu and Wang 2009). At the sentential level, however, the issue is still unclear. Sentence-final lengthening is even more extensive than that at the phrasal level, thus using the same cue as sentence-medial boundaries (Tseng et al. 2005; Yuan et al. 2006). However, such lengthening has also been linked to topic shift (Smith 2004). In other words, there is a conceptual overlap between two functions: topic and boundary. Further research on the issue is clearly needed.

36.3 FROM INDIVIDUAL EFFECTS TO GLOBAL PATTERNS

While the full picture about the coexistence of tone and intonation in Chinese languages is still far from clear, an increasingly detailed sketch is emerging from continued empirical research. As the discussion so far has shown, intonational information is encoded by

modifying various aspects of the target approximation process for lexical tones, including, in particular, pitch range and duration. These modifications are associated with various specifically defined communicative functions. Interestingly, once the impacts of these modifications are added together, some of the widely recognized global patterns also start to emerge, including, in particular, declination and rhythm.

36.3.1 Declination

With the exception of final F_0 raising by question modality, most of the pitch range modifications by various functions are in the direction of generating an F_0 down trend over the course of an utterance. First, from the left edge, a *new topic* raises sentence-initial F_0 (by about at least 1 st across different topic levels; Wang and Xu 2011) and lets the subsequent F_0 gradually drop. Second, if the sentence happens to have a nonfinal *focus*, the global F_0 pattern is further tilted in two ways: on-focus raising (unless the tone is Low) and postfocus lowering. Third, the final word, and especially the final syllable of a statement, is lowered in F_0 to contrast with the rising question intonation. Fourth, whenever a sentence consists of more than just the High-level tone (Tone 1 in the case of Mandarin), the non-High tone lowers the F_0 of the following tone relative to the preceding tone. This effect is known as downstep (Stewart 1965). Being directly related to lexical tones, it could be fully attributed to an articulatory effect of carryover assimilation. However, equations [1] and [2] given earlier would predict more than sufficient time for F_0 to fully recover after a non-High tone (because a syllable of 180 ms allows F_0 to shift either up or down by more than 12 st, well over the amount of F_0 shift between any two adjacent tones). The fact that full recovery does not happen suggests that speakers apply insufficient amount of effort to return to the original pitch height. Thus it is possible that downstep is also partially attributable to topic and/or modality.

Putting these pitch range modifications together thus leads to a global F_0 down-trend similar to the intonational phenomenon known as *declination*, which refers to an observed gradual decline in F_0 over the course of an utterance (Cohen and Hart 1967). But the knowledge about the different sources of this downtrend allows us to see that declination is likely a *byproduct* of a joint effect. In Figure 36.3a, for example, we can see only a slight downtrend over the course of a five-syllable all-High-tone sentence. When the sentence consists of alternating High and Low tones, a much larger overall downtrend can be seen. But with the all-High-tone sentence as the reference, we can see clearly that this is due to two downsteps that each renders a post-Low High tone lower than the pre-Low High tone. Taking a closer look at the first downstep, we can also see that it consists of two components: pre-Low F_0 raising and post-low F_0 lowering. While the latter is the familiar carryover effect, the former is known as *anticipatory raising* or *anticipatory dissimilation*, which has been found not only in Mandarin (Xu 1997) but also in Yoruba (Lamiran and Clements 2003), Thai (Gandour et al. 1994), and Cantonese (Gu and Lee 2007). In Figure 36.3b, an even greater downtrend can be seen thanks to the on-focus raising of the High tone and postfocus lowering of all subsequent tones.

Together with the topic raising and sentence final-lowering, which are more readily observed in longer sentences (Liu and Xu 2005; Wang and Xu 2011), the global declination is therefore attributable to a combination of individual mechanisms.

36.3.2 Rhythm

A widely known hypothesis is that languages of the world can be divided into three rhythm classes depending on the type of unit involved in manifesting an isochrony tendency: stress-timed, syllable-timed, or mora-timed (Abertcrombie 1967). Although empirical research has repeatedly shown that no true isochrony exists (Ramus et al. 1999), more recent efforts have been devoted to developing measurements that can still separate languages along the rhythm-class dimension (Ramus et al. 1999). Like declination, however, rhythm is a global pattern summarized across all the segments in many sentences in a speech corpus. So an obvious question is whether, also like declination, the grossly measured rhythm pattern as a gestalt is decomposable into individual temporal properties, each with a specific articulatory or communicative source. Indeed, some of the sources are plainly obvious. A stress language like English, in which syllable duration is a major acoustic cue of word stress (Fry 1958), undoubtedly would exhibit a gross temporal pattern different from that of a nonstress language like French. A lesser-known source that clearly contributes to an isochrony tendency is known as polysyllabic shortening (Lehiste 1972), which generates a trend toward equal duration for words of different lengths. Interestingly, however, there is evidence that polysyllabic shortening is actually stronger in Mandarin, arguably a syllable-timed language (Lin and Wang 2005) than in English (Nakatani et al., 1981; Xu and Wang 2009). More importantly, because polysyllabic shortening is directly related to boundary marking (Xu and Wang 2009), it is a byproduct of a clearly defined communicative function (Tseng et al. 2005; Wagner 2005; Yuan et al. 2006). Furthermore, duration patterns are affected by additional factors whose sources are relatively clear: intrinsic segment duration (articulatory; Klatt 1973), focus (functional), and contrastive vowel length (functional). Overall, the evidence suggests that speech rhythm is likely an epiphenomenon derived from a number of independent articulatory and functional mechanisms, and as such it has little to do with either isochrony or language-specific holistic temporal control.

36.4 SUMMARY

To summarize, the concurrent realization of tone and intonation in Chinese languages is likely achieved by controlling different aspects of the target approximation processes. While lexical tones are mainly encoded by local pitch targets in terms of height and slope, various intonational functions are likely encoded mainly via modifications of pitch range and syllable duration. Once the contributions of each of the articulatory

mechanisms and functional codes are recognized, it is possible to also better understand global intonational patterns such as declination and rhythm.

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CHAPTER 37

-tone

XIAONONG ZHU AND CAIYU WANG

37.1 WHAT IS TONE?—A POPULAR VIEW

WHEN Westerners hear Chinese people talk, what impresses them first would probably be the “musical accent”—a fascinating feature of the language. A sound *xian* in Pekingese (Beijing Mandarin), for instance, can mean “tasty” 鲜 when it is produced with a high level pitch or “salty” 咸 with a rising pitch. This kind of pitch, which can distinguish word meanings, is called *tone* in linguistics.

Chinese is a tone language. Among its hundreds of geographical varieties, some have more tones than others. Cantonese (Hong Kong/Guangzhou Yue), for example, is generally considered as having nine tones while Pekingese possesses four. Within those that share the same number of tones, their pitch shapes (dipping, falling, etc.) may differ. Even for those that share the same pitch shape, their meanings could differ. For example, in Tianjin, a city not far from Beijing, though the sound *xian* can also be produced with a high level or a rising tone, it means “salty” 咸 or “show” 显, respectively.

Tone has always been considered a pitch phenomenon, as implied in the “tone letters” of IPA or the five-point scale (FPS) designed by Chao (1930), which denote the height and direction of pitch. This view also prevails in the linguistic literature for the definition of tone. For example, “A language is a ‘tone language’ if the pitch of the word can change the meaning of the word” (Yip 2002:1), or “Tone, affiliated to the syllable, can be defined as a phonologicalized pitch category with three or more members, which can differentiate lexical meanings” (Zhu 2010:273).

This popular view applies to the simple tonal systems such as that of Mandarin or Cantonese. There are, however, complex systems in which not only pitch but also phonation/register matters. This chapter provides a general profile of both simple and complex tonal systems, and brief accounts of tonal representation, tone bearing unit, tone change in connected syllables, and the birth of tone. Due to space limitation, topics such as features, inventories, typology, universals, perception, and development of tones are not included in this chapter.

For the purposes of cross-language comparisons, tones are referred to in their historical categories (except for Pekingese): *ping*(sheng) or *even (tone)* 平 (声), *shang* or *rising* 上, *qu* or *departing* 去, *ru* or *entering* 入, *yin* 阴 and *yang* 阳, which are coded as T₁, T₂, T₃, T₄, “a,” and “b,” respectively. “T₂,” for example, stands for *shangsheng*, “T_{1a}” for *yinping*, “T_{4b}” for *yangru*, and so on. To avoid confusion, however, Pekingese tones have retained their pedagogical names of Tone 1, Tone 2, Tone 3, and Tone 4, rather than the historical names of T_{1a}, T_{1b}, T₂, and T₃.

37.2 WHAT IS TONE?—A MORE SOPHISTICATED VIEW

The simplest yet most effective way to define a thing is to locate it in a logical classification. If we can determine what phonological category tone affiliates with (the upper level category), what kinds of categories tone contrasts against (members of the same category), and what kinds of members tone comprises (lower level categories), the question “what is tone?” can be readily answered.

It has long been controversial among phonologists what the tone bearing unit is, which equates to the question of what phonological category tone belongs to. The literature on tone shows different preferences, *vowel, mora, rime, final, voiced portion of a syllable, or just tone bearing unit*. An insightful suggestion assigned tonal features to “individual syllables” (Wang 1967/1991:171). Following this thread, a syllable-tone model has been developed as shown in Figure 37.1.

A syllable has two kinds of components: linear and nonlinear. *Tone* is the nonlinear immediate constituent of the syllable, while *segmental* is the linear one, which

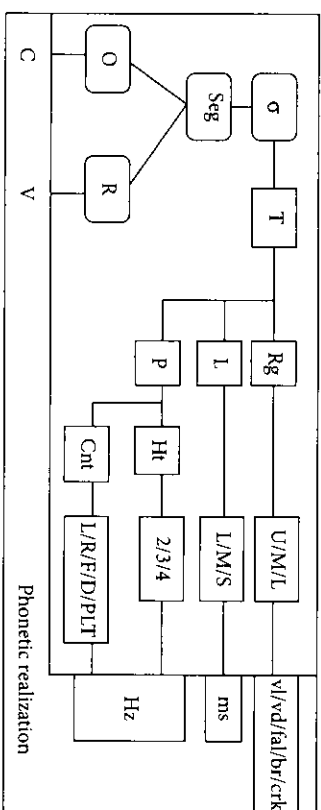


FIGURE 37.1 The structure and affiliation of tone (adapted from Figure 4, Zhu 2011). T = tone, Rg = register, L = length, P = pitch, Ht = height, Cnt = contour, U/M/L = upper/modal/lower, L/M/S = long/mid/short, 2/3/4 = two-/three-/four-way contrast, L/R/F/D/PLT = level/rising/falling/dipping/pure low tone; vl/vd/fal/br/crk = voiceless/voiced/falsetto/breathy/creaky, ms = millisecond, Hz = unit of frequency defined as the number of cycles per second.

dominates *onset* and *rime*. Tone consists of three components: *register, length, and pitch*; pitch comprises *height* and *contour*. Tone is, therefore, to be represented along four parameters: *register, length, height, and contour*. These parameters can be subcategorized. *Register, length, and height* all show a tripartition contrast, that is, *register* U, M, and L; *length* Long, Mid, and Short; and *pitch height* in two-way, three-degree, and four-level contrasts. *Contour* can be categorized as *level, rising, falling, dipping*, and the less known but rather frequent type *pure low tone* (Zhu 2012a).

More explanation is needed for Figure 37.1. First, it has been a tradition for millennia in Chinese phonology to treat tone as a component of a syllable, just like *onset* and *rime*. The basic unit in phonology should be a structural unit, that is, *syllable*, rather than the smallest analytical unit. In this regard, the relationship between phonology and phonetics is like that between chemistry and physics. In phonetics and physics, scientists explore the smallest element, while in phonology and chemistry, the whole study is established on a structural unit: *syllable* in phonology and *molecule* in chemistry. Had chemistry not had its own basic, structural unit, it would not have been independent or autonomous from physics. Second, phonologically, *register, length, and pitch* are associated to *tone*. Phonetically, they are realized on different linear components. *Pitch* and *length* are shown on *rime*, and *register* could be on *onset* or *rime*, as suggested in Wang (1967/1991:171), “the tone features are sometimes relevant for the initial consonant, sometimes for the nuclear vowel, and sometimes for the final consonants.” Third, after the hierarchical nonlinear components have been defined, it is not important which component is called “tone.” We can call either the component T, the P, or the Cnt “tone,” or call them “tone₁,” “tone₂,” and “tone₃,” respectively. In Figure 37.1 “tone” is used as an umbrella term, covering all nonlinear syllabic components. Fourth, three values have been assigned to the parameter *height*: the two-way contrast in pitch height referring to stress and the accentual tone in Japanese, the three-degree one to the African register tone, and the four-level one to the Asian contour tone. Fifth, in intonation languages like English, nonlinear components or laryngeal activities are much fewer, and therefore the nonlinear tier is not a necessity in their phonological representation. A few nonlinear components in these languages such as the two degrees of pitch (strong vs. weak), length (long vs. short), and phonation (voiceless vs. voiced) can be treated as secondary features of vowels, that is, suprasegmentals (stress and length), or consonants’ properties (voicing). In tone languages, on the contrary, there are more components in the nonlinear tier; the convention of treating tones in phonology as attachments to segmentals cannot work at all, at least neither systematic nor elegant. Finally, tone is by and large in complementary distribution with stress. In a typical tone language such as Cantonese, there is no room for stress, because (a) the language is monosyllabically morphemic and stress resides on bi-/polysyllabic words, and (b) pitch, the main phonetic cue for stress in nontonal languages, is fully utilized for the distinction of tone in tone languages.

Table 37.2 Pekingese tones represented by features

| | Tone 3 [214] | Tone 4 [51] | Tone 2 [35] | Tone 1 [55] |
|---------|--------------|-------------|-------------|-------------|
| Falling | + | + | - | - |
| Rising | + | - | + | - |

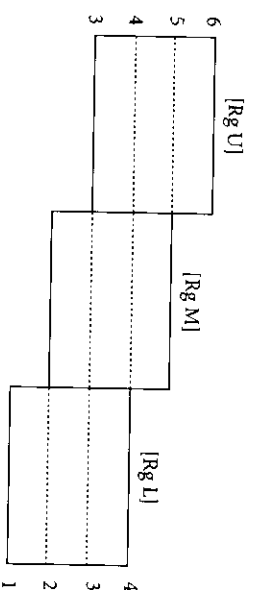


FIGURE 37.3 The Multi-Register and Four-Level Tonal Model (Zhu 2012b)

How to represent tone has been a focused area in phonology for decades. A popular view, initiated from Woo (1972) and especially Goldsmith (1976), regards contour tone as a concatenation of level tones for the reason of simplicity. Simplicity is important indeed, but it is not an ultimate goal in science. “Everything should be made as simple as possible, but not simpler” (Einstein). While only overall simplicity is worthy of pursuing, local simplicity here doesn’t mean simplicity there and everywhere. Simplicity in the unit for representation has caused complexity in the whole process of representation and impeded further studies. The criteria for choosing an entity for tonal representation should take into consideration its accountability for descriptive and theoretical adequacy, typological universals, and evolutionary principles.

37.4 WHAT DOES A SIMPLE TONAL SYSTEM LOOK LIKE?

While pitch is a necessary tonal component, length and register are not. The simple tonal system refers to the single-register one, with or without length contrast. Most varieties of Mandarin, Hakka, and Cantonese have such a system. Their tones reside in Rg M, and tone values are from {2} through {5} (RLM transcriptions are placed in curly braces).

37.4.1 Pitch-Only Systems

The simplest type in tone languages is the single-register system without length contrast, that is, the pitch-only one. For example, in the case of Beijing and Tianjin Mandarin,

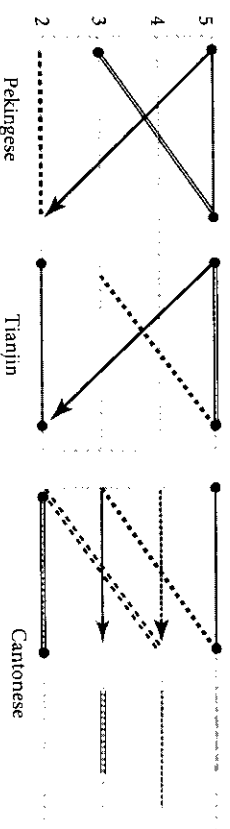


FIGURE 37.4 [Left] pitch-only systems (Pekingese and Tianjin). [Right] a pitch-length system (Cantonese)

tonal information is carried and only carried by pitch. Mandarin dialects, except the Jianghuai 江淮 and Qinjin 秦晋 subgroups and some Southwestern varieties, present this pitch-only type. The tonal systems of Pekingese and Tianjin are analyzed in the RLM and shown in Figure 37.4. Their tones are optimally distributed in Rg M: high (level), (pure) low, rising and falling, and their tonal values are transcribed as {55, 35, 22, 52}¹. This is indeed the simplest yet most distinct pattern in a four-tone system.

37.4.2 Pitch-Length Systems

In the pitch-length system, both pitch and length contribute to the word contrast. In Hakka and Min, for example, a sharp length distinction occurs between its short *ru* tones and long *shu* ones 舒声. Cantonese is another example. As shown in the right panel of Figure 37.4, there are nine tones in Cantonese, six *shu* tones and three *ru* ones. Among the *shu* tones two are rising and four are level (but the highest T1a has a falling variant, and the lowest T1b is often phonetically realized as low falling, ending with creak). T4a has split into two, a short and higher versus a mid-short and lower, which results in a tripartition of length in Cantonese. In comparison, the short and the mid-short *ru* tones are respectively about one-third and two-thirds of the *shu* ones in length (Zhu et al. 2008).

37.5 THE COMPLEX TONAL SYSTEM

Unlike Mandarin, Hakka, and Cantonese, the Central Chinese dialects of Wu, Xiang, and Gan, and other East and Southeast Asian languages (e.g., Hani of the Tibetan-Burman family, Dong of Tai-Kadai, and Wa of Austroasiatic) have the complex tonal system. In these languages, not only pitch and length but also register participate in tone differentiation or recognition. Figure 37.5 shows two double-register systems with a different nature of phonation types and pitch heights. Yueyang 岳阳 Xiang has Registers U and M as there is Falsetto or Fortis voice in the dialect, and the pitch values range from

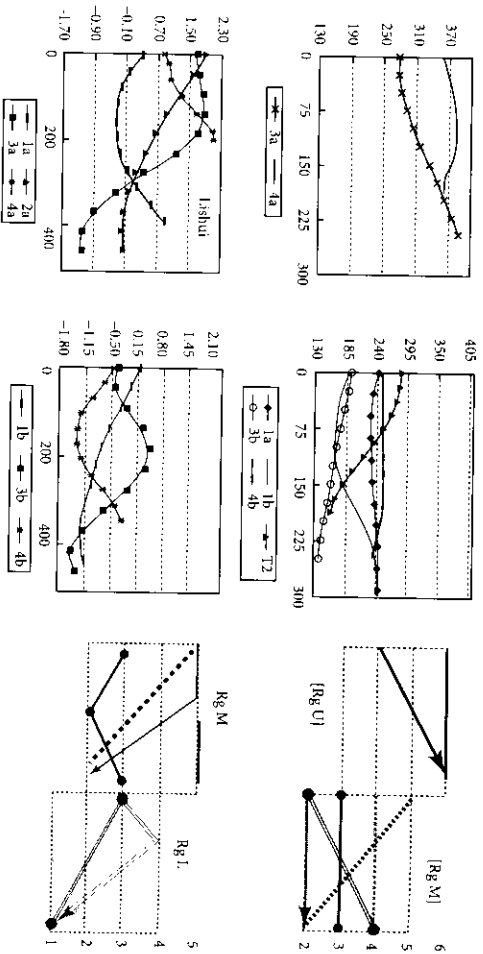


FIGURE 375 Double-register systems with five pitch levels. Short tones are denoted by underlining their tone values.

{2} through {6}. Lishui 丽水 Wu has Registers M and L as there is Breathy voice in it, and the pitch values are from {1} through {5}.

Yueyang has seven tones, two of which, placed in Rg U, are produced in Falsetto or Fortis voice and the remaining five in Rg M are produced with Clear Voice (Voicelessness). There are seven tones in Lishui too, four *yin* tones in Rg M and three *yang* tones in Rg L, which are produced with Breathy voice. The six long tones in Lishui are perfectly paired in terms of contour.

Creaky voice is usually an accompanying feature of low tones in Rg M, but occasionally it serves as a distinctive feature and incurs an additional Register L. The upper panel in Figure 376 illustrates a pair of dipping tones of Tongshan, Jiangsu province 江苏省铜山县, a Zhongyuan 中原 Mandarin variety. As shown in the figure, these two dipping tones start with almost the same high tone head. The difference between the two lies in the phonation type. The dipping tone on the left is produced in normal voicing, but the one on the right is produced with Creaky voice, which makes the pitch curve break in the middle of the process. In this case, an Rg L is required to accommodate the creaky dipping, as shown in the bottom panel. Typologically, these dipping tones can be defined as “pure low tones” and transcribed as {2z} and {11}.

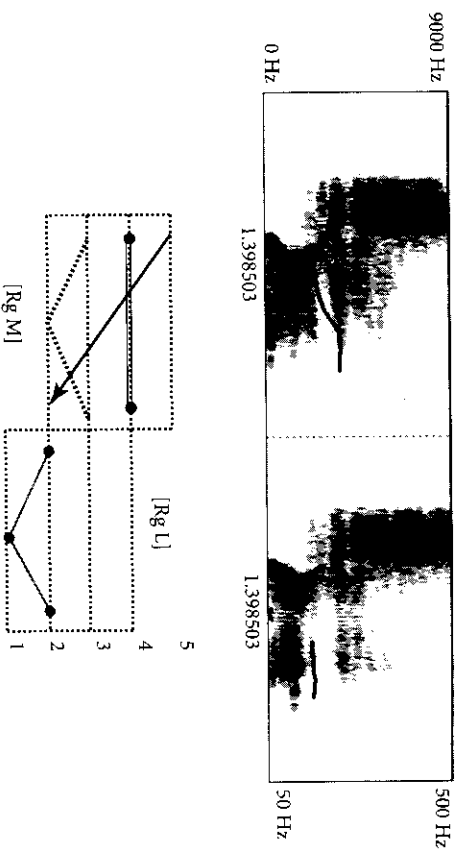


FIGURE 376 A double-register system with five levels in Tongshan Mandarin (a) Two dipping-tone words, *ci*³²³ 想, and *ci*²⁰² 多. (b) A schematic representation of the four Tongshan tones.

Triple-register systems are rarely seen. Wenzhou Wu and its nearby dialects such as Wenling, Yongjia, and Rui'an are examples of such systems. Wenzhou preserves all eight Middle Chinese tonal categories. The syllables in *ru* tones, however, have been softened, that is, they have dropped their stop codas and are no longer short, thus have no segmental and length distinction from the *shu* tones. The two sharp rising T2a and T2b are in Falsetto or Fortis voice. Among the other six tones, while the three *yin* tones are produced in clear voice, the three *yang* tones are in Breathy or Modal voice. Wenzhou tonal system is represented in the schematic Figure 377.

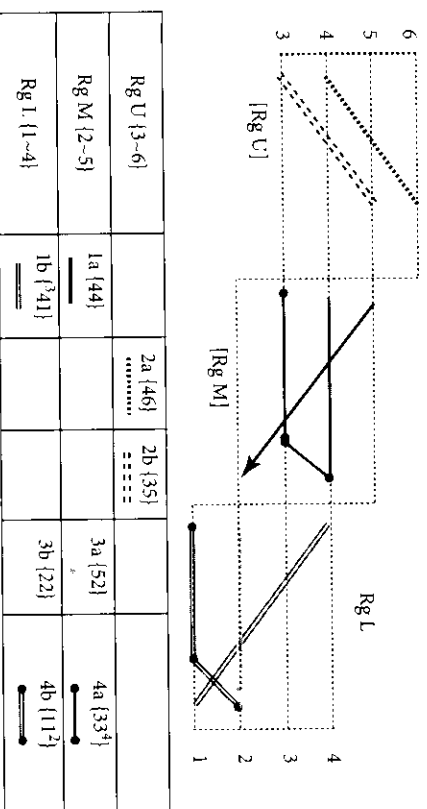


FIGURE 377 A triple-register system with six pitch levels in Wenzhou Wu

37.6 TONE CHANGE IN DISYLLABIC COMBINATIONS

When two (or more) tones are connected in a word or a phrase, one or both of them may change. This kind of tone change is called “tone sandhi.” A typical example is the Tone 3 sandhi in Pekingese: a Tone 3 (low dipping) will change to Tone 2 (high rising) when it is followed by another Tone 3, for example, *yòu + jǐng* [Tone 3+Tone 3] 有井 ‘there is a well’ => *yóu + jǐng* [Tone 2+Tone 3] = 油井 ‘oil well’ (Wang and Li 1967/1991:187).

Mandarin (and Cantonese as well), however, is inactive in this regard. Wu and Min, however, are famous for their complicated tone sandhi. There are two types of tone sandhi in Northern Wu subject to syntactic structure. In Min there is tone sandhi related to a phenomenon known as “vowel/tone co-alternation” 变韵, for example, T3b word [kiau⁴²] 舅 ‘mother’s brother’ would change to [kiu⁵¹] in the word /kiau⁴² kung⁵³/ 舅公 ‘grandma’s brother’.

The puzzling situation of the Northern Wu tone sandhi was first revealed by Kennedy (1953) in Tangxi 塘栖, Zhejiang province. He found two tone patterns at different syntactic levels and termed them “High Mountain” Pattern (the word level) and “Cook Soup” Pattern (the phrasal level). The former refers to a pitch stretching/spreading process on a disyllabic word in which the tone of the first syllable spreads rightward and thus determines the pitch pattern of the whole word. For example, the combination of the tones of the syllables *ka³³* ‘high’ and *sae³³* ‘mountain’ is [33–33], *ka⁵¹* ‘artificial’ and *sae³³* is [53–31], and *dhu²⁴* ‘large’ and *sae³³* is [22–44] or [22–24]. The “Cook Soup” represents the other pattern occurring in disyllabic phrases. In this pattern, while the tone of the second syllable maintains its citation value, the first tone becomes a midlevel one, no matter what their original shapes are. For example, when *sa³³* ‘cook,’ *ma²⁴* ‘self’ and *ma⁵¹* ‘buy’ are the first syllables in their combination with *hang³³* ‘soup,’ *mie²⁴* ‘noodles’ and *tze⁵¹* ‘wine,’ respectively, their tones all turn into a midlevel pitch while the tones of *hang³³*, *mie²⁴*, and *tze⁵¹* remain unchanged.

Kennedy’s finding opened a new field, and a series of effective studies came forth, for example, a formal analysis of tone sandhi in Min (Wang 1967/1991:179), findings of more conservative sandhi forms than citation forms in Wu (Li 1979) and in Min (Ting 1982), and acoustically based explorations into tone sandhi in Wu (Rose 1990; Zhu 1995).

37.7 THE BIRTH OF TONE

Languages of East and Southeast Asia were not born with tone but developed from the nontonal ones. The studies pertaining to tonogenesis have a long history and generally fall into two types. One, starting from the philologists in the Qing Dynasty such as Gu Yanwu 顾炎武 and Duan Yucai 段玉裁, focuses on the phonological categorization of the Four Tones 四声 and their split and merger in Old Chinese. The other type,

beginning in 1950s, is based on the data of Asian languages to explore phonetic motivations for tonogenesis. The consonant-driven theory proposed by Haudricourt (1954a, 1954b) is generally regarded as a classic on this topic. In his theory, Haudricourt suggested that the consonants at both ends of a syllable induced tones in Vietnamese and Chinese, that is, the prevocalic consonants determining the pitch height and the postvocalic ones the contour. This hypothesis was widely accepted when it was justified by the phoneticians (Homberg et al. 1979).

Other linguists noticed the role of glottal tension in tonogenesis. Yan (1959) expounded the general phenomenon that tense vowels were pronounced higher in pitch while lax vowels were lower. He advanced that this distinction of pitch height was determined by the “laryngeal tension” (“喉头松紧”) which finally led to the birth of tone. Later, more attention was drawn to the function of laryngeal activities in the tone’s production. Matisoff (1973) listed an inventory of “tense-” and “lax-larynx syndrome” to characterize laryngeal attitudes that may affect pitch height. Thurgood (2002) suggested a need to replace Haudricourt’s consonant-based account with a “laryngeally based account” in tonogenesis.

In recent years, more and more research indicates the essential function of phonation types in tonogenesis (Zhu 2007, 2009b). There were no tones in Old Chinese 2,000 years ago. Instead, Old Chinese possessed nonclear voices such as falsetto and breathy voice (Zhu 2007, 2010b). These two phonations together with voicelessness intrinsically invoked three tiers of pitch height. These pitch differences, which originally were accompanying features of the phonation types, were gradually enhanced by two phonological and morphological properties that the noncontour-tone languages lack. The first was syllables with strong resonance. F_0 shows on the resonant part of a syllable, usually the syllabic nucleus (vowel). The more resonant the syllable is, the better the environment is for the emergence of tone. Chinese is exactly such a language, which “sounds rather melodious, perhaps a little like singing” (Wang 1973/191:333). The second was the monosyllabic morpheme. This enables each syllable to be long enough for the production and distinction of pitch contour. Again, this is a remarkable trait of Chinese. With all these phonetic, phonological, and morphological conditions ready, now came the last step of the formation of tones—the enhanced pitch differences were formally accepted by the language in which they resided. In other words, the different pitches were grammaticalized as a phonological category of *tone*. In Chinese, this phonological process of grammaticalization occurred during the period between the 3rd and 5th centuries, from the time when the Eastern Han Dynasty started collapsing, through Wei-Jin, to the early Southern and Northern Dynasties. Scholars in the 5th century such as Shen Yue 沈约 and Zhou Yong 周顒 realized that there were four tonal categories or tonemes in the language, which made an otherwise identical syllable different. These four tonemes were phonetically realized as eight allotones conditioned by the “clear” 清 (clear voice, including voiceless) or “murky” 浊 (breathy/modal voice) sounds (Wang 1967, 1987; Zhu 2009b). In some Chinese varieties, with the de-breathing or devoicing of the murky syllables, phonation differences gradually disappeared and pitch differences thus became a main distinctive feature of the syllable. This is the case in Mandarin, Cantonese, and

Hakka today. In Wu, Gan, and Xiang, however, the Middle Chinese murky sounds are still preserved and even new breathy-voiced sounds have developed, which brings about the recategorization of existing tones.

37.8 SUMMARY

Tone is generally considered a phonological category of pitch. This is true when there is no phonation contrast in the language. But note that, on the one hand, pitch can also define English stress, Japanese accent, and African register tone, and, on the other hand, tonal categories in some cases, for example, Tongshan, can be distinguished without pitch contrast.

Tone is in fact a combined effect or a complex of laryngeal activities and is hierarchically structured in phonology. It is composed of *register*, *length*, *pitch height*, and *contour*. According to the absence and presence of register, tonal systems are classified into the simple (including the pitch-only and pitch-length) system and the complex one, which includes the register-pitch and register-length-pitch subsystems, widely attested in Wu, Gan, Xiang, and other languages in East and Southeast Asia.

There are probably more tone languages than nontonal ones in the world,² and the "melodious tongue" (i.e., Chinese) "is spoken by more people than any other" (Wang 1973/1991:333). Therefore, to understand the nature of Chinese tones is almost "indispensable to a general understanding of the nature of human language" (Wang 1973/1991:333).

NOTES

1. Pekingese Tone 3, although transcribed as [214], has various phonetic variants such as [21, 11, 212] etc. In fact, it is a "pure low tone" and typologically represented as [22] in R.L.M.
2. "By some estimates as much as 60–70 per cent of the world's languages are tonal" (Yip, 2002:1).

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CHAPTER 38

TONE PERCEPTION

GANG PENG AND CAICAI ZHANG

38.1 INTRODUCTION

INTONATION, which is signified by pitch variation across a phrase or a sentence, is present in all languages. In tone languages, pitch patterns at the syllable level further distinguish lexical meanings. For example, in Mandarin, the syllable /i/ with high level tone means 医 “a doctor,” and the same syllable with high rising tone means 姨 “aunt.” The term “tone” refers to the systematic use of pitch patterns to distinguish lexical meanings in a language. The main acoustic correlate of tone is the fundamental frequency (F₀; Wang 1972), which corresponds to the reciprocal of vocal fold vibratory period during speech production. Pitch is the perceptual correlate of F₀, which refers to how a listener places a sound along a scale from low to high pitch. The faster the vocal folds vibrate, the higher the F₀ in production and the higher the pitch in perception.

To describe pitch patterns in a tone language, Chao (1930) proposed five-scale tone letters, which are an analogy of a musical scale. For example, a high falling tone can be described as 51, with 5 referring to the high onset pitch and 1 referring to the low offset pitch of this falling contour.

Tone systems differ from each other in terms of how the pitch patterns are organized. Take Mandarin and Cantonese as an example. Mandarin makes use of pitch contour to construct its tone system. There are four lexical tones in the Mandarin tone system, each of which carries a distinct pitch contour, for example, high level (Tone 1, /i55/ 医 “doctor”), high rising (Tone 2, /i35/ 姨 “aunt”), low falling-rising (Tone 3, /i214/ 椅 “chair”), and high falling (Tone 4, /i51/ 意 “meaning”). The Cantonese tone system explores the difference in both pitch contour and pitch height, in addition to another dimension of difference in duration. There are six long tones in Cantonese, in addition to three short ones, which are generally believed to share the pitch property of three corresponding long tones. Three of the six long tones contrast a flat pitch at three pitch heights, giving rise to three level tones: high level tone (Tone 1, /i55/ 医 “doctor”), middle level tone (Tone 3, /i33/ 意 “meaning”), and low level tone (Tone 6, /i22/ 二 “two”). The remaining three

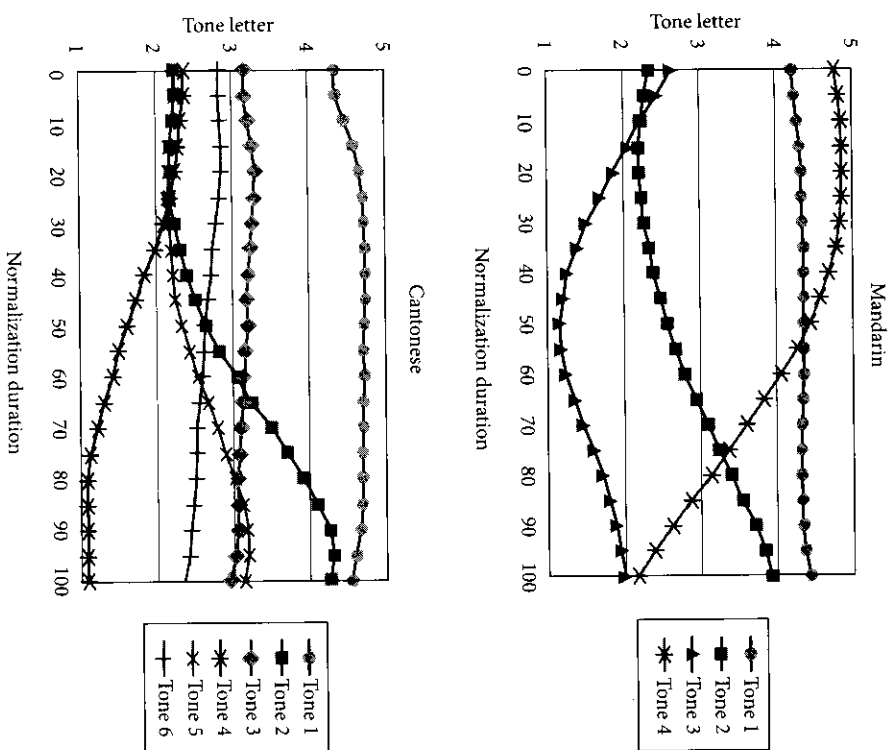


FIGURE 38.1. Tone values plotted as a function of the percentage of the rhyme duration for Mandarin (upper) and Cantonese (bottom) tone systems. Only six Cantonese long tones are shown here. Tone values are calculated from F₀ measurements that are rescaled to Chao's (1930) tone letters.

tones are contour tones: high rising tone (Tone 2, /i25/ 椅 “chair”), low rising tone (Tone 5, /i23/ 耳 “ear”), and low falling tone (Tone 4, /i21/ 儿 “son”). Figure 38.1 demonstrates the Fo trajectory of Mandarin and Cantonese tone systems.

Although tone systems vary dramatically across languages, pitch patterns that can occur in tone languages are limited. Based on Chao's tone letters, Wang (1967) defined a set of thirteen tones that represent all the tones that can occur. Wang then proposed seven phonological features, the binary values of which can minimally distinguish these thirteen tones (see Table 38.1). Among these seven features, “high,” “central,” and “mid” serve the purpose of distinguishing five level tones; “contour” is a feature that distinguishes contour tones from level tones in general; and “rising,” “falling,” and “convex” are devoted to the separation of eight contour tones.

Table 38.1 Phonological features of tone

| | 55 | 11 | 44 | 22 | 33 | 35 | 13 | 53 | 31 | 535 | 313 | 353 | 131 |
|---------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|
| Contour | — | — | — | — | — | + | + | + | + | + | + | + | + |
| High | + | — | + | — | — | + | — | + | — | + | — | + | — |
| Central | — | — | + | + | — | — | — | — | — | — | — | — | — |
| Mid | — | — | — | — | + | — | — | — | — | — | — | — | — |
| Rising | — | — | — | — | — | + | — | — | — | + | + | + | + |
| Falling | — | — | — | — | — | — | — | — | + | + | + | + | + |
| Convex | — | — | — | — | — | — | — | — | — | — | — | — | + |

Adapted from Wang (1967).

In addition to description efficacy, the perceptual reality of tone features is also important. Thanks to the advent of speech analysis and synthesis technology in the mid-20th century, a wealth of knowledge has been accumulated about tone perception. Gandour (1983) is an important example in this regard. He found that listeners mainly rely on two underlying dimensions, “height” (average pitch of a pitch contour) and “direction” (direction of pitch movement within a syllable) in tone perception. For example, Mandarin speakers can distinguish high level tone from high rising tone based on the difference in the “direction” of pitch contour; Cantonese speakers detect the difference in pitch “height” among three level tones. Interestingly, there is a rough match between the two dimensions discovered in Gandour and tone features proposed by Wang (1967). The “height” dimension is related to the “high” feature; the “direction” dimension corresponds to the “contour” feature. Gandour’s work highlights the importance of substantiating the phonological features of tone with perceptual evidence.

Apart from the behavioral aspects of tone perception, much has been learned about the brain mechanisms of tone perception, thanks to noninvasive neuroimaging technologies such as the electroencephalography and functional magnetic resonance imaging. Electroencephalography records continuous bioelectrical signals of neuronal populations from the scalp surface (e.g., Luck 2005). Event-related potentials relate electroencephalography signals to a certain event, such as the onset of a tone stimulus. An advantage of event-related potentials lies in their high temporal resolution, which is capable of revealing instantaneous processing of tone in the brain at the time scale of milliseconds. Functional magnetic resonance imaging measures the hemodynamic response in the brain related to the execution of a cognitive function. It is characterized by high spatial resolution and can be used to study brain regions that support tone perception.

In the following, we discuss tone perception and its brain mechanisms from five perspectives: (a) the influence of native language experience, (b) categorical perception (CP) of tone, (c) hemispheric lateralization of tone processing, (d) cross-domain influence of music and tone perception, and (e) perceptual property of contour tone.

38.2 CROSS-LINGUISTIC INFLUENCE ON TONE PERCEPTION

It is well established that native language experience affects how one perceives tones (e.g., Wang 1976; Hallé et al. 2004; Peng et al. 2010). Tone language speakers are more accurate at identifying and discriminating tones than non-tone language speakers; moreover, among tone language speakers, speakers are better at perceiving native tones than nonnative tones (Lee et al. 1996).

The influence of native language experience may be implemented by adjusting the weight assigned to a set of perceptual cues that listeners commonly rely on in tone perception (Gandour 1983). As mentioned earlier, listeners mainly rely on “height” and “direction” in tone perception. Nevertheless, depending on the organization of pitch contrasts in a language, listeners develop specific sensitivity to each pitch dimension. Compared to non-tone languages, tone language speakers are more sensitive to pitch “direction,” presumably because of the importance of distinguishing pitch contours in tone languages. For different tone languages, the relative importance attached to each dimension is also language-dependent. Cantonese listeners place more importance on the “height” dimension than Mandarin listeners do, which is related to the contrast of multiple level tones in Cantonese.

It is clear from behavioral studies that language experience modulates tone perception. What is less clear, however, is how language experience shapes each level of processing in the brain. Recent studies suggest that language experience modulates early sensory processing of pitch at the subcortical level, as reflected by frequency following response, which traces brainstem-level neural response to an auditory stimulus (e.g., Skoe and Kraus 2010). Pitch encoding as revealed by frequency following response is enhanced in tone language speakers, suggesting that subcortical sensory processing of pitch is reorganized by long-term language experience (e.g., Krishnan et al. 2005).

At the cortical level, language experience further influences pitch processing. Auditory processing of pitch changes without subjects’ focal attention, as reflected by the mismatch negativity (MMN), has been found to differ between tone and non-tone language speakers. As mentioned before, tone language speakers attach more weight to pitch “direction” than non-tone language speakers do. This behavioral finding is also attested by the MMN (Chandrasekaran et al. 2007). In the detection of a change in pitch contour, greater MMN amplitude is found in Mandarin listeners than in English listeners. It implies that the ability to extract cues in pitch “direction” is enhanced in Mandarin listeners.

When listeners actively attend to and identify the tone stimuli, an event-related potential component, the P300, is found to reveal cross-linguistic difference in higher level phonological processing (Zheng et al. 2012). Greater P300 amplitude is elicited by phonologically contrastive pitch difference in Cantonese listeners than in Mandarin

listeners. It suggests that Cantonese listeners distinguish tone contrasts with greater ease than Mandarin listeners do, possibly because the exposure to a richer tone system has enhanced Cantonese listeners' discriminability of pitch.

In summary, it has been found that language experience influences each level of processing, from subcortical sensory processing, to auditory processing without attention, to higher level phonological processing. The influence at each level likely accumulates to generate the eventual behavioral differences.

38.3 CATEGORICAL PERCEPTION OF TONE

Categorical perception refers to the phenomenon that listeners accurately perceive the difference between two categories, whereas they disregard acoustic difference within a category (e.g., Liberman et al. 1957). When listeners are asked to identify a continuum of pitch stimuli, each separated by equal acoustic distance, they assign some stimuli to one category and the other stimuli to a different category. When listeners are asked to discriminate two stimuli from two categories, the accuracy is higher than when they discriminate two acoustically equally separated stimuli from the same category. It means that the acoustic space is warped by phonological categories in the perceptual space. The perceptual space is stretched around a phonological boundary and compressed within a phonological category, such that listeners are more accurate at detecting across-category differences than within-category differences.

Wang (1976) first demonstrated CP of high level tone and high rising tone in native Mandarin speakers. Mandarin speakers are more accurate at discriminating across-category stimuli than within-category stimuli, showing CP of the tone stimuli. Although English speakers also detect pitch differences, they discriminate a level pitch and a rising pitch more accurately than two rising pitches with different rising magnitudes. It indicates that the perceptual space of English speakers is not shaped by phonological categories. Rather, English speakers are more sensitive to the psychoacoustic difference in pitch contour (i.e., level pitch vs. nonlevel pitch).

Since the seminal work of Wang (1976), CP of tones has been replicated in Mandarin (Peng et al. 2010) and also reported in Taiwan Mandarin (Hallé et al. 2004) and Cantonese (Peng et al. 2010), whereas non-tone language speakers like German speakers process pitch differences psychoacoustically. Both Mandarin and Cantonese listeners show CP of high level tone and high rising tone, but the phonological boundaries is further shaped by the organization of tones in each language (Peng et al. 2010; see Figure 38.2).

Furthermore, CP of tones is not restricted to speech sounds. The CP effect is carried over to the processing of nonspeech pitch stimuli to some extent, suggesting that long-term representation of tone categories influences pitch processing in general (Peng et al. 2010; Xi et al. 2010).

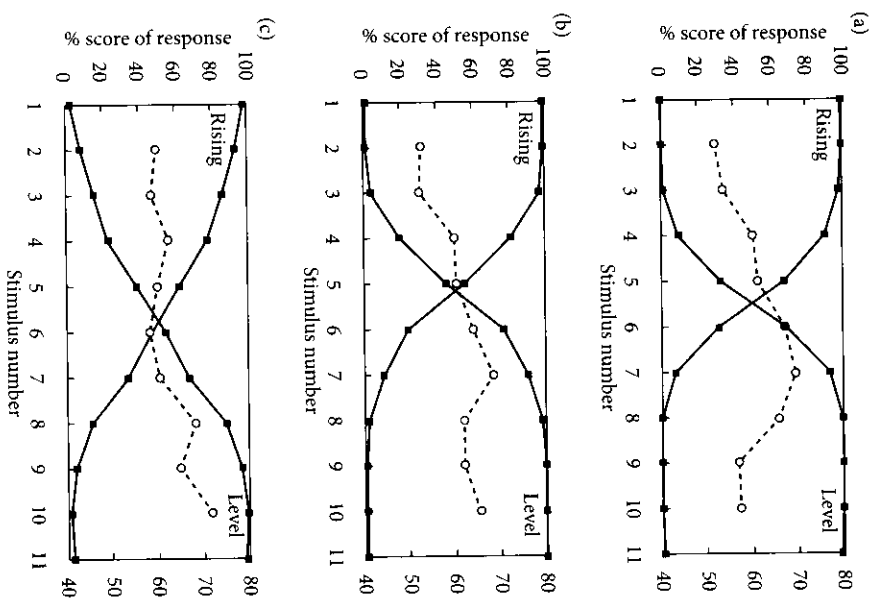


FIGURE 38.2. Identification (solid lines) and discrimination (dashed lines) curves pooled across participants for the pitch continuum ranging from high rising tone to high level tone. The left *y*-axis indicates the percentage score of identification responses, while the right *y*-axis indicates the discrimination accuracy. (a) Mandarin participants, (b) Cantonese participants, and (c) German participants. Adapted from Peng et al. (2010).

However, studies on level tones fail to obtain evidence for CP. Abramson (1979) reported that there is no evidence for CP of Thai level tones. There is a similar finding for Cantonese level tones (Francis et al. 2003). Because Cantonese speakers exhibit CP of a contrast between high level tone and high rising tone, the lack of CP is likely due to specific properties of level tones. The contrast of a level tone and a contour tone could be determined by a perceptual threshold in the slope of pitch contour. However, there is likely no fixed threshold between two level tones, only continuous change in pitch height. It has been found that the relative height of a level pitch is difficult to determine without an external pitch reference (e.g., a context; Peng et al. 2012). The perception of level tones strongly depends on context (C. Zhang et al. 2012, 2013) and is likely less categorical without context.

38.4 HEMISPHERIC LATERALIZATION OF TONE

It has long been found that language processing is dominant in the left hemisphere in an overwhelming majority of right-handed individuals. Two hypotheses have been proposed to account for the left hemisphere dominance of language processing (see Zatorre and Gandour 2008 for a review and many references therein). The function-dependent hypothesis is that language processing is lateralized to the left hemisphere and music processing is lateralized to the right hemisphere. The cue-dependent hypothesis is that temporal processing is lateralized to the left hemisphere and spectral/pitch processing is lateralized to the right hemisphere. Such acoustic asymmetry is thought to be the low-level acoustic basis for the asymmetry of linguistic and musical processing (Belin et al. 1998; Zatorre and Belin 2001), because speech perception mainly depends on temporal information in non-tone languages and music perception mainly depends on pitch information.

Interestingly, as far as lexical tones are concerned, these two hypotheses diverge in their predictions. Function-dependent hypothesis predicts left-hemisphere dominance for lexical tone processing because tones carry linguistic function (i.e., distinguishing lexical meanings; see, e.g., Gandour et al. 2004; Schirmer et al. 2005; van Lancker and Fromkin 1973). Cue-dependent hypothesis predicts right hemisphere dominance for lexical tone processing because tones rely on slowly changing pitch information that extends several hundreds of milliseconds (e.g., Zatorre et al. 1992).

Recently, an integrated approach has recognized the importance to move beyond the dichotomy of cue-dependent and function-dependent hypotheses and to emphasize the importance of both acoustic cues and linguistic function (Zatorre and Gandour 2008). A two-stage model has been proposed, which states that acoustic cues and linguistic function differentially modulate the hemispheric lateralization at different stages of processing (Luo et al. 2006). At an early stage, speech is initially processed as a general acoustic signal, where acoustic cues dominate the processing. At a later stage, when speech (including tones) is mapped onto the linguistic representation, neural circuits lateralized to the left hemisphere are activated. However, so far mixed results have been obtained.

For early auditory processing, it has been found that the MMN responses to tone contrast are larger over right hemisphere electrode sites than over left hemisphere electrode sites in contrast to consonants (Luo et al. 2006). This indicates that early auditory processing of pitch cues without attention is lateralized to the right hemisphere. However, recent studies have found that the MMN responses to tone contrast are lateralized to the left hemisphere (Gu et al. 2013; Xi et al. 2010). Inconsistency in the previous studies is likely due to the different stimuli and paradigms used. When language processing is required beyond auditory processing,

findings are that the processing of lexical tones is predominantly lateralized to the left hemisphere in native tone language speakers (e.g., Gandour et al. 2004; L. Zhang et al. 2011, 2012). We await future studies to unveil a clearer picture of tone lateralization at different stages.

38.5 TONE AND MUSIC

Systematic use of pitch is not unique to language. In music, where musical tones are hierarchically organized to form a melody, pitch is also important. There is an intricate interaction between lexical tones and music tones. Experience with lexical tones and musical tones are mutually transferable, but this does not mean that tone language speakers are all musicians. However, research does show that tone language speakers are more likely to possess absolute pitch, an extraordinary ability to identify a musical note without the aid of a reference note (e.g., Deutsch et al. 2009). Although the potential to acquire absolute pitch is universally present at birth for speakers of any language, learning to associate pitches with words in a tone language may nurture the ability of absolute pitch (Deutsch et al. 2009; Peng et al. 2013). Transfer from musical training to lexical tone perception is also attested. Musicians in a non-tone language are capable of performing equally well as tone language speakers in tasks of tone perception. In some sense, music is like a tone language. Training in music may parallel learning to speak a tone language.

Cross-domain influence of lexical tones and musical tones may be partly contributed by the common sensory pathway at the brainstem level. Studies find that pitch encoding at the brainstem level is enhanced by both tone language experience and musical training (e.g., Bidelman et al. 2011). Tone language speakers show more accurate and robust pitch encoding than non-tone language speakers; musicians show more accurate and robust pitch encoding than non-musicians. Enhanced sensory processing responds to any incoming pitch stimulus, regardless of whether it is linguistic or musical. Faithful pitch encoding ensures more efficient processing at later stages, where lexical tones and musical tones might engage divergent brain networks.

38.6 CONTOUR TONE

In linguistics, there has been a debate over the theoretical status of contour tones. Contour tones are prevailing in Chinese dialects and languages in Southeast Asia. To accommodate the prevalence of contour tones, Wang (1967) proposed the “contour” feature, which serves the purpose of distinguishing contour tones from level tones.

Since then, there have been attempts to decompose a contour tone into a sequence of level tones, for example, to replace a rising or falling tone with a sequence of low and high tones (see Duanmu 1994 for discussions). From the theoretical point of view, disregarding the "contour" feature simplifies the system of tone features. But empirical studies of tone perception cast some doubt on this simplification: Do listeners perceive a contour tone as a sequence of level tones?

In a letter to Kenneth Pike, Edward Sapir discussed the psychological property of contour tones (cited in Pike 1948). According to Sapir, movement from point A to point B is not really the same thing as movement in a direction away from A and toward B. Psychologically one can experience the movement in a direction away from A and toward B without reference to fixed points A and B. For example, a similar sensation can be elicited by the movement between some other points, as long as the direction and amount of movement is comparable. In other words, perception of movement is relative, which can be independent of the fixed reference points. Although redefining a movement as fixed points A and B simplifies the description, such simplification sacrifices the important properties of the movement *per se*.

Some evidence for the perceptual inequality of contour tone and level tone can be found in the literature. First, studies of CP reveal differences between contour tones and level tones. In contrast to contour tones, level tones are perceived noncategorically without context. Second, contour tones and level tones may be processed differently neurally. As mentioned earlier, tone language experience enhances pitch encoding at the brainstem level. However, experience-dependent enhancement is not widespread across the whole pitch trajectory. Rather, the enhancement is found in the rapidly changing portion of a pitch contour, for example, in the rising portion of a high rising tone (Krishnan et al. 2005, 2009). It indicates that tone language speakers are selectively sensitive to the dynamic pitch movement of a tone.

38.7 SUMMARY

This chapter summarizes what we have learned about tone perception from behavioral and brain imaging studies in the past few decades. We discussed how native language experience modulates pitch processing from sensory processing to phonological processing, how contour tones are perceived categorically and level tones less categorically, how pitch processing is lateralized at different stages of processing, how music and tone experience influences each other, and how experimental studies can provide insights into the phonological descriptions of contour tone. Eventually, an overview of tone perception studies will help us better understand the experience-dependent development of the brain mechanisms for Chinese languages.

FURTHER READING

For an early review of tone perception studies with insightful discussions, see Gandour (1978). For more on brain imaging techniques, see Luck (2005) for an introduction to event-related potential and see Skoe and Kraus (2010) for a tutorial of frequency following response.

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PART 7

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SOCIOCULTURAL
ASPECTS
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CHAPTER 39

LANGUAGE REFORM IN MODERN CHINA

PING CHEN

39.1 INTRODUCTION

The second half of the 19th century witnessed broad sectors of the Chinese community engaged in enthusiastic discussions on approaches to comprehensive reform of the country, and in many areas, in tentative but steady action toward the objective. While Europe had undergone significant changes since the Industrial Revolution, China relatively stagnated during the same period, subsisting as a complacent and in many ways moribund empire largely isolated from the rest of the world. Successive military defeats at the hands of Western powers and Japan since the first and the second Opium War (1839–1842, 1856–1860) jolted the country into realization that China had lagged far behind other countries in national strength and generated a sense of urgency for drastic change to all major aspects of society. As the nation underwent soul-searching for solutions, it was argued, and agreed by many, that the Chinese language and its writing system were to a great extent responsible for the very low educational and intellectual level of the broad Chinese population, as they were too difficult to learn and use by the great masses of the people (cf. Chen 2007). With the illiteracy rate as high as more than 80%, it was thought the Chinese language must undergo comprehensive reform, in much the same way as the Japanese language since the Meiji Restoration. Thus unfolded in China what is considered by Crystal (1987) as “the most ambitious program of language planning the world has ever seen.” It started in the second half of the 19th century and has continued into the 21st century.

The reform of the Chinese language over more than 100 years consists of three major components: establishment and promotion of a written standard based on contemporary Northern Mandarin to replace the traditional written standard based on Old Chinese, establishment and promotion of a spoken standard, and reform of the traditional logographic writing system.

39.2 ESTABLISHMENT AND PROMOTION OF MODERN WRITTEN CHINESE

Norms of written standard in almost all languages differ in varying degrees from those of the vernacular in that the former typically display more features of a literary style, while the latter a colloquial style. The standard written Chinese before the 20th century, known as *wenyanwen* 'classical literary language', was rather unique in that it was by and large based on the Old Chinese of more than 2,000 years ago and was divorced from contemporaneous vernacular Chinese. The disassociation of the classical literary language from contemporaneous speech might have been a main factor underlying its instrumentality for continuous use across extensive spans of time and space in a country with a long history and great dialectal diversity. Whereas mutually unintelligible dialects were spoken in various parts of China, the same written language was used consistently across the country, not unlike the situation in Europe before the Renaissance when Latin was the standard written language in many countries that might have their own respective vernaculars. It was maintained that the traditional written Chinese, written in a logographic writing system divorced from the actual pronunciation of any of the distinct Chinese dialects, played a significant role in perpetuating the continuity of the Chinese civilization over millennia and, to a certain extent, was less of a disintegrating factor in Chinese history as were the vernacular languages in early Modern Europe. On the other hand, such a written standard demanded much more time and effort on the part of learners and users than a written language based on their everyday speech, thus making it incommensurate with a society that needed mass literacy for its progress and development in modern times (cf. Cooper 1989). As the classical literary language was based on Old Chinese for its linguistic norms, it was also considered to be too stilted in style and deficient in vocabulary for use in a modernizing society.

Alongside the classical literary Chinese as the standard written style for more than two millennia, another written style of Chinese, known as *baihuawen* 'vernacular literary language', had developed since the late Tang Dynasty (618–907), which was largely based on contemporaneous colloquial speech in Northern China. It had gained widespread popularity and become part of the literary competence of almost all educated people in the millennium before the 20th century, thanks to the influence of many works of popular literature, including poems, dramas, and novels, that were composed in the vernacular written language. While the classical literary language was the standard style of written Chinese on formal occasions, the vernacular literary language was the style in common use for informal purposes, such as in diary, book-keeping, casual notes, and so on. The reform of the standard written Chinese in the 20th century was, in essence, to replace the classical literary language with the traditional vernacular style as the basis of a new written standard for all purposes.

Among the most influential advocates for the reform of the traditional written style in the late 19th century was Huang Zunxian 黄遵宪 (1848–1905), a diplomat, poet,

and scholar, who summarized his views in a succinct poem line *wo shou xie wo kou* 我手写我口 'my hands write what I say with my mouth' in 1868. The proposition, which argued for the unification of speech and writing, was accepted by an increasing number of scholars, educators, and publishers in the following decades as a cogent and timely proposal in the right direction. First newspapers in vernacular literary Chinese were published in 1898, followed by another 140 newspapers and journals in the next decade or so. More than 50 textbooks and 1,500 novels were published in the vernacular literary style during the same period. The vernacular literary Chinese as an alternative writing style gained some official recognition when it was stipulated in the first Regulations on Primary and Secondary Schools approved by the Imperial Court of the Qing Dynasty in 1904 that, in addition to retaining Chinese classics as the main content of the curriculum, school children were also to be taught how to write short paragraphs in vernacular language and how to translate classic Chinese into a vernacular style.

The traditional colloquial literary language was advocated mainly as an economical tool to foster mass literacy, to be taught to those who could not afford the time and effort for the classical literary language. It was Hu Shi 胡适 and his like-minded comrades, in what has been known as the New Cultural Movement in the late 1910s and 1920s, who launched the most comprehensive and effective campaign to replace the classical literary Chinese with a new vernacular-based written standard for all major purposes. By that time the Chinese community as a whole was more ready to accept a new written standard than decades earlier, and opposition against replacement of the stilted classical literary style, as portrayed in some accounts of the process, was greatly exaggerated. What was really at issue at the time was what defining features the new written language should have, rather than whether there should be a new written standard. Hu Shi (1935) provided a definitive answer to the question with his proposal of *Guoyu de wenxue*, *wenxue de Guoyu* 国语的文学, 文学的国语 'literature in national language, and a literary national language'. Citing examples of the development of modern European languages such as English and Italian, Hu Shi argued that norms of the new written standard were not to be artificially stipulated but should be derived from the best of literary works both in the tradition of *Honglou Meng* 红楼梦 'The Dream of Red Mansion' and *Shuihu Zhuan* 水浒传 'Water Margin', and composed by contemporary writers in *Guoyu* 'national language', which referred to the standard spoken form of Chinese being developed at the time. At the same time, the national language itself needed to adopt a literary style. Thus, according to proponents, the new written standard of Chinese should differ from the traditional literary language in that it should be based on the contemporary vernacular of Northern Mandarin and from the primitive vernacular in that it should be an enriched form of vernacular that is flexible and expressive enough for various purposes in the 20th century. The development of the national language, in written and spoken form, proceeded in the ensuing decades by and large along the lines delineated by Hu Shi and his comrades.

While based on Northern Mandarin, standard written Chinese that has evolved since the 1930s is enriched from three major sources: classical Chinese, other Chinese dialects, and European languages and Japanese. Unlike Latin, which has been relegated to

rare and highly specialized usage in societies of modern European languages, classical Chinese is alive and well in contemporary Chinese communities, both as a special written style on its own and, more important, as a bountiful source of morphemes and expressions in standard written Chinese for general purposes. It is generally agreed that a sound foundation in classical Chinese is essential to skills in written Chinese. It is for these reasons that the traditional classical literary Chinese has always been an important component of the Chinese subject in school. Education authorities under successive Chinese governments are consistent with their guidelines for curriculums of the Chinese subject in high school to have at least 30% to 40% of textbook chapters composed of materials in classical Chinese.

Another source of input into the modern written Chinese is dialects other than Northern Mandarin. As many of the influential writers in the formative period of standard written Chinese in the first half of the 20th century were native speakers of Wu dialects and Southwestern Mandarin, many expressions and constructions from these non-Northern Mandarin dialects have found their way into the norms of modern written Chinese. Foreign languages, European languages, and Japanese in particular have also exerted significant influence on the evolution of modern written Chinese. It has been strongly advocated, and agreed by many, that Europeanization of the Chinese language would enhance the expressivity and precision of the language, making it better suited for high-level education, research, and other endeavors. Comparing written Chinese in common use at the end of the 1920s with that in the mid-1950s, Wang Li, an eminent Chinese linguist, observed that the latter had "progressed" greatly in terms of lexicon, grammar, and logic of discourse, largely as a result of Europeanization. He also noted, approvingly, that well-written articles in newspapers and journals could now be translated into Russian or English almost word by word and sentence by sentence without the need for major changes to the linguistic structure (Wang 1980:31).

39.3 ESTABLISHMENT AND PROMOTION OF STANDARD SPOKEN CHINESE

A *de facto*, if not *de re*, standard form of spoken Chinese dates back at least as early as the time of Confucius (551–479 BCE), known as *Yayan* 雅言 'elegant speech'. While the linguistic characterization of *Yayan* is still open to debate, most experts in Chinese linguistics maintain that its phonology was based on norms of the literary pronunciation of Chinese characters by teachers in the Imperial College in Luoyang in the Zhou dynasty (c.1100–221 BCE). It was based largely on the dialect spoken in the *He Luo* 河洛 'Yellow River and Luo River' or *Zhongzhou* 中州 'Central China' area centering around Luoyang, the capital of East Zhou Dynasty (770–256 BCE), but had retained features preserved from earlier periods of Shang Dynasty (c.1700–1100 BCE). It was the language customarily used in education and in communication for public and official purposes.

Confucius, for example, according to historical records, always used *Yayan* in his teaching activities, although his native language was another Chinese dialect.

The *de facto* standard for educational and formal purposes also served as the *lingua franca* in China, where dialectal diversity developed as population migrated en masse mainly from the central Yellow River regions to other parts of the country. *Yayan* of the Zhou Dynasty evolved in the next millennia in much the same pattern as it did earlier. On the one hand, its phonology was by and large based on the contemporaneous dialect of the region around Luoyang, and later on Kaifeng, which were the capital cities of several imperial dynasties; on the other hand, it contained phonological features from earlier periods preserved through the verbal instruction of the literary reading of characters from one generation to another and with the aid of dictionaries and rhyme books. Also, the lexical and grammatical norms of the *lingua franca* were based on the vernaculars in the broader areas in northern part of the country. This is essentially the linguistic base of the early vernacular written language discussed in the last section. It also assumed other names like *Tongyu* 通语 'general speech' and has generally been known as *Guanhua* 官话 'public/official speech, Mandarin' since the 14th century.

There was no explicit codification of the spoken norms of the *lingua franca* in China in premodern times, as in the form of dictionaries in phonographic languages where spelling indicates fairly clearly the standard pronunciation of words and expressions. Traditional Chinese dictionaries and rhyme books may indicate the phonological categories of characters but offer little clue as to their actual standard pronunciation. The norms of the pronunciation of *Yayan*, *Tongyu*, and *Guanhua* spread to other parts of the country mainly through students in school where they learned from their teachers the pronunciation of thousands of characters one by one. However, only a small proportion of Chinese population received any amount of education before the 20th century. Even for the educated few, their proficiency in the spoken *lingua franca* varied greatly in different regions. As far as we can tell from what little anecdotal evidence is available, it was generally very low in the Southern dialect areas. Difficulty in oral communication in *Guanhua* by natives of southern provinces of Fujian and Guangdong was serious enough to prompt the imperial court of the Qing Dynasty to set up institutes of standard pronunciation in the early 18th century to train the local students and officials in the pronunciation of *Guanhua* but with little success.

Standardization and promotion of a national language, after the successful model of Japan as advocated by many Chinese scholars and officials who were familiar with the language reform in that country, won support of the government in the final years of the Qing Dynasty and also the succeeding government of the Republic of China. *Guoyu* 'the national language,' a name originating in Chinese and used by the Japanese as the official name of their national language, was borrowed back and replaced *Guanhua* as the official name of standard Chinese. A resolution passed by the Ministry of Education in 1911 proposed several major tasks for the standardization of the national language, among which were codification of its standard pronunciation and the design of a sound indicating system to facilitate its promotion. A Conference on Unification of Pronunciation was convened in Beijing in 1913 under the sponsorship of the Ministry of Education of the newly

established Republic of China. Delegates to the conference, who were appointed either by provinces as their representatives or by the Ministry of Education, decided by voting the standard pronunciation of about 6,500 characters one by one. The outcome was presented in a dictionary *Guoyin Zidian* 国音字典 'Dictionary of National Pronunciation', which was not formally published until 1919. It was also decided that a set of sound indicating symbols used at the conference to mark the pronunciation of characters should be officially adopted as the standard sound-annotating system of Chinese, called *Zhuyin Zimu* 注音字母 'sound annotating alphabet', to be used in the promotion of the standard national language. A resolution was also passed at the conference to promote the national language across the country, with such measures as setting up training institutes for teachers, preparing dictionaries and records of pronunciation as teaching aids, and marking standard pronunciation alongside characters in school textbooks and other publications.

The implementation of the resolution passed by the conference proceeded very slowly, in no small measure due to the fact that the phonology of the national language adopted by the conference, instead of based on a specific variety of Chinese language, was a mixture of Beijing Mandarin and residues of the old *Guanhua*, which was spoken by no one as their native tongue. It caused much controversy and confusion among teachers and students over what should be taken as the standard pronunciation. Representing the opinions of an increasing number of scholars, teachers, and language planners, a committee charged with the revision of the 1919 dictionary decided that the phonology of the national language should be based entirely on contemporary Beijing Mandarin, with different pronunciations of some characters added as variants only. The revised phonological system, known as the new national pronunciation, in contrast with what was called the old national pronunciation in the 1919 *Guoyin Zidian*, was presented in *Guoyin Changyong Zihui* 国音常用字汇 'A Glossary of Frequently Used Characters in National Pronunciation' published in 1932, with the pronunciation of 12,219 characters marked in both *Zhuyin Fuhao* 注音符号 'sound annotating symbols' (renamed from *Zhuyin Zimu*) and *Guoyu huomazi* 国话罗马字 or *Gwoyu romatzyh* 'national language romanization', a newly designed phonetic writing using the Latin alphabet. At a language planning conference convened in 1955 by the government of the People's Republic of China, the name of *Guoyu* was replaced by *Putonghua* 普通话 'common speech', which is defined as follows:

Putonghua is the standard form of Modern Chinese with the Beijing phonological system as its norms of pronunciation, and Northern dialects as its base dialect, and looking to exemplary modern works in *baihua* 'vernacular literary language' for its grammatical norms.

The definition has culminated the efforts since the turn of the 20th century toward the establishment of a standard form of Modern Chinese. It has continued with the practice of taking Beijing Mandarin as the base of the phonological system and endorsed the proposal advanced by Hu Shi that the national language should be a literary language. The pronunciation and lexical norms of *Putonghua* are codified in dictionaries

like *Xin Hua Zidian* 新华字典 'New China Dictionary' and *Xiandai Hanyu Cidian* 现代汉语词典 'Modern Chinese Dictionary', which have gone through several revisions since the 1950s.

Successive Chinese governments since the 1920s were consistent in their earnest promotion of the national language. Textbooks, dictionaries, records of pronunciation, and other teaching aid materials and equipment were produced in abundance with the aim to promote the standard language in school and the broader community. Leaving aside various local operas, which as a matter of convention have to use their local dialect, *Putonghua* has always been the standard language used predominantly in movies, radio, and television broadcasting in China. It is the official medium of instruction in school, with teachers having to pass the proficiency test in *Putonghua* as part of their qualifications. The promotion of *Putonghua* has accelerated since the 1980s, as rapid economic development and advances in communication technology have both demanded and facilitated wider use of the standard language. A directive issued by the State Council in 1992 set the goal that *Putonghua* was to become not only the medium of instruction but also the language for all activities in secondary schools and normal colleges in urban areas by 2000. Meanwhile, increasingly higher requirement on proficiency in *Putonghua* is made of staff in the government and the other service sectors, with the objective to have *Putonghua* as the only language to be used in public service by 2000. The latest survey conducted in 1999–2003 reports that 53.06% of the Chinese-speaking population can use *Putonghua* in their communication with others (LSC Team 2005, 2006). It is also estimated that 90% of the population has acquired comprehension proficiency in *Putonghua*.

39.4 REFORM OF TRADITIONAL CHINESE SCRIPT

Writing systems in the world fall into two broad groups: logographic and phonographic. They differ mainly in that the basic graphic unit in the former indicates both speech sound and meaning and in the latter it indicates speech sound only. The Chinese writing system is a prototypical logographic writing system, with the basic graphic unit, the Chinese character, encoding pronunciation and meaning. So far as sound indicating is concerned, what differentiates the Chinese script most remarkably from phonographic writing systems like that of English is that, while component letters of English words correspond, albeit far from perfectly, to component segments of sound of the words, the actual phonetic value of a Chinese character, almost always in the unit of a syllable, is not indicated in an explicitly decomposable manner as is the case with English and may vary considerably in different times and locations, in a way similar to how Arabic numbers are pronounced in different languages. It is largely by virtue of this feature that the same Chinese script can be used to record the Chinese language millennia of years

and thousands of miles apart. There are hundreds of Chinese characters that may serve as sound-indicating components in another containing character with the same or similar pronunciation in most cases, which makes it relatively easy to learn the characters associated in this manner. Nevertheless, there are still hundreds of Chinese characters whose graphic shapes and pronunciations have to be learned and memorized one by one mechanically, which exacts a considerable amount of time and effort before one gains basic literacy. It was due to these features that the Chinese writing system was considered to be difficult to learn and use, thus held as mainly responsible for the very low literacy rate in China in the final years of the 19th century (cf. Chen 2007).

Reform of the traditional Chinese script thus constituted a most important part of language reform in China. There have been two main approaches to the reform, phonetization and simplification. The goal of the former is to replace the traditional logographic system with a newly designed phonographic one and that of the latter to simplify the traditional script mainly through reducing the number of component strokes of characters, reducing the number of characters in common use through merging characters with the same pronunciation, and deleting variant forms of the same character.

Phonetization started with Matteo Ricci (1552–1610) and other Jesuit missionaries who went to live in China from the 1580s. They designed the first Romanized scheme for writing Chinese to transcribe Chinese proper names and to facilitate Chinese learning by foreigners. They were followed by other Western missionaries, diplomats, and scholars who, by the end of the 19th century, had designed phonetic writing for almost all the major Chinese dialects, mainly as an alternative writing system in the translation of the Bible and for other pedagogical and communicative purposes. Taking inspiration from their endeavors, native Chinese have designed more than 1,000 schemes of phonetic writing from the end of the 19th century up to the present day, either as a sound-indicating tool to aid the learning and use of characters, or as a bone fide writing system to be used alongside the traditional script, or, as some have intended, to replace the latter in due course. Among the most influential ones are *Zhuyin Zimu* promulgated by the Ministry of Education of the Republic of China in 1918, *Guoyu luomazi* or *Gwoyue romatzyh* 'National language Romanization' published by the same government in 1928, *ladinghua xin wenzi* 拉丁化新文字 or *latinxua sin wenz* 'latinized new script' designed by Chinese communist scholars in collaboration with Soviet linguists and first published in the Soviet Union in 1929, and *Hanyu Pinyin*, or *Pinyin* in shortened form 'Chinese phonetic writing', which, released in its final version by the government of the People's Republic of China in 1958, has since been adopted as the official phonetic writing of Chinese in China, Singapore, the United Nations, and is most widely learned and used elsewhere in the world (cf. Chen 1999). All four of the schemes are based on the phonological system of the standard spoken Chinese, *Guoyu* or *Putonghua*. Schemes adapted from them were later developed for other Chinese dialects such as Minnan and Cantonese but are little known or used except by researcher and dictionary compilers.

The last three of the four previously mentioned schemes of phonetic writing of Chinese, together with hundreds of others, were intended at first by their designers to serve as a full-fledged writing system for the Chinese language, but none of them

succeeded in spite of strong support from the top level of the government in some cases. The failure has been attributed to many factors, a most important one being that there are too many homonymous characters in Modern Chinese, which are easily differentiated by the graphic shapes of the characters but would look the same in a phonetic writing system, causing ambiguity and slowing down the speed of processing on the part of readers.

Simplification of the traditional Chinese script as part of language reform started in the 1920s. Following a number of draft schemes circulated for discussion, the first list of simplified characters was promulgated by the Ministry of Education under the Nationalist government in 1935. It was composed of 324 simplified characters that were to be used in school textbooks and other publications. Due to fierce opposition from some ranking government officials, however, it was withdrawn the next year. Simplification of the script resumed in the 1950s under the government of the People's Republic of China. Following years of discussions and debate on a number of draft schemes, what has been called the First Scheme of Simplified Chinese characters was officially released in 1956. It comprises three parts. Part One is composed of 230 simplified characters, which were to replace their complicated counterparts in all publications immediately. Part Two contains 285 simplified characters, and Part Three contains 54 simplified radicals, which were for trial use only. The First Scheme went through some fine-tuning and was gradually accepted as the standard form in the following years. A General List of Simplified Characters comprising 2,236 characters was promulgated by the Chinese Commission of Script Reform in 1964, which, having incorporated all the revisions made to the 1956 scheme, has since served as the standard for the characters involved. A Second Scheme of Simplification, comprising 853 simplified characters and 61 simplified radicals, was published in 1977 for trial use but was withdrawn the next year and was formally repealed in 1986 with the explanation from the language planning institution that it was not well conceived in the first place and publicized in haste without proper consultation. Accompanying the decision to abolish the Second Scheme was the statement that stability of the writing system should be maintained and greater prudence must be exercised in attempts at further reform of the script. Aside from fine-tuning some characters, no further scheme of simplification of the Chinese script has been proposed since then.

The average number of the strokes of the 2,236 simplified characters in the 1964 General List, which have replaced a total of 2,264 traditional characters, has been reduced from 15.6 to 10.5, making it easier to write and read. Before the simplification, of the 2,000 characters in most common use, 917 have one to ten strokes, 1,030 have eleven to twenty strokes, and 53 have more than twenty strokes. The 2,000 characters in complicated form were superseded by 1,967 simplified characters in the 1964 General List, of which 1,395 have one to ten strokes, 570 have ten to twenty strokes, and just 2 had more than twenty strokes (cf. Chen 1999).

The simplified Chinese script, as presented in the 1964 General List, has been the standard in mainland China, whereas the traditional script remains in Taiwan and Hong Kong. There have been dissenting voices against simplification in mainland China, just as there have been calls for simplification of the traditional characters in Taiwan. There

is no denying the inconvenience caused by the existence of two systems of the Chinese script. However, the general opinion in mainland China seems to be that the benefit brought about by the simplification of the script to generations of learners and users has far outweighed any shortcomings it has had or inconveniences it might have caused. With the great majority of the population in mainland China, almost all people below the age of sixty-three having acquired literacy in the simplified script, reverting to the traditional script would be too costly to contemplate. On the other hand, it also seems unlikely for the Chinese language planning institution to further simplify the script on a large scale and even more unlikely to launch renewed attempts at phonetic writing as a formal writing system of Chinese (cf. Li 2005).

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CHAPTER 40

LANGUAGE POLICY OF CHINA'S MINORITY LANGUAGES

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40.1 INTRODUCTION

Ever since ancient times, China has been a country composed of a large number of ethnic groups speaking diverse languages. Since the 1950s, the policy on minority languages in China has centered on the general objective of serving the minority people and ensuring equal rights for all ethnic groups. Considerable efforts were made to increase literacy and to provide education in science and technology. The purpose of this chapter is twofold: first, to provide an overall description of the concrete measures taken in four different eras, and second, to review all the major achievements, as well as the problems, over the past sixty years in line with the general objective.

40.2 BEFORE 1949

In remote antiquity, China boasted numerous ethnic groups, as well as a great number of languages and different forms of writing systems. Up to 3,000 years ago, historical events such as wars between various ethnic groups, sacrifice offerings, and human sacrifices were recorded in oracle inscriptions. According to speculation, distinct languages were in use at that time. The earliest records of minority languages dates back to the Han times when Yang Xiong lived (53–18 BC): *Youxuan Shizhe Juedaiyu Shi Bieguo Fanyan* 輶轩使者绝代语释别国方言 (Local speeches of other countries in times immemorial explained by the Light-Carriage Messenger), the first glossary of linguistic terms used in different parts of the country. Research in later generations of this book unveiled

that it recorded terms of archaic Chinese as well as minority languages. Afterward, in *Yueren Ge* 越人歌 (Song of the Yue boatman) and *Bailang Ge* 白狼歌 (Song of the Bailang people), Chinese characters were employed to record a Tai-Kam language and a Tibeto-Burman language, respectively. Tibetan script created around the 7th century was used to record Tibetan and other minority languages, leaving rich stone inscriptions and historical documents. In later centuries, such northern groups as the Turks, ancient Uyghur, Tangut, Jurchen, and Khitan created scripts for their mother tongues, while in the south the Dai, Yi, Naxi Dongba, Lesui, and Ersu Shaba script were created in different times. On the other hand, Chinese characters and Chinese-based logograms, such as *sawndip* or the Zhuang characters, and square-shaped Bai characters, were employed by the minority peoples. Up until the Ming and Qing Dynasties, a great number of documents recording the minority languages were produced, among which the series of *Hua Yi Yiyu* 华夷译语 (Sino-barbarian dictionaries) deserve mentioning most. In these documents, dozens of minority languages were recorded, including word lists and texts. Another document is *Wuti Qingwenjijian* 五体清文鉴 compiled between 1673 and 1708, a dictionary with 18,671 items in cross-referenced five languages and scripts, namely Manchu, Tibetan, Mongolian, Uyghur, and Chinese.

However, before 1949, no data regarding the exact number of ethnic minority groups and languages used were available. Even though scholars at that time started to investigate minority languages and writing, such endeavors were not implemented systematically. Only a few scholars, out of sheer personal interest, were able to apply modern linguistic approaches in their fieldwork, with Chao Yuenren and Li Fang-Kuei as two cases in point. Chao investigated the Zhuang and Yao languages in Guangxi and published *Guangxi Yaoge Jiyin* (Phonetic notation of the Yao songs in Guangxi), while Li conducted fieldworks on the Buyei language in Guizhou and the Zhuang and Sui languages in Guangxi and published *Longzhou Tuyu* (Longzhou Zhuang patois), *Wuming Tuyu* (Wuming Zhuang patois), *Bo'ai Tuyu* (Bo'ai Zhuang patois), *Suihua Chui* (A glossary of Sui), and *Mohua Jilue* (A sketch of the Mo language). (See Li 2004.)

During World War II, many scholars transferred to Xinan Lianda (United University in Southwestern China) and conducted research on the minority languages in Southwestern China (Luo 2008). Luo Changpei investigated Dulong, Dai, Nu, Bai, Lisu, Naxi, Jingpo, and Langu languages in Yunnan and published *Gongshan Qiyu Chutan* (Preliminary study on Dulong in Gong Mountain) and *Gongshan Nuyu Chutan* (Preliminary study on the Nu Language in Gong Mountain). Yuan Jiahua published *Axi Mingge ji qi Yuyan* (Folksongs and languages of the Axi Yi group) and *Eshan Wonyu Chutan* (Preliminary study on the Woni Yi language in Eshan area). Ma Xueliang and Gao Huanian published *Sani Yiyu Yanjiu* (A study on Sani Yi speech). Fu Maoji also published in collaboration with Luo Lianshan *Baiyi Yuwen Chutan* (Preliminary study on the Baiyi Yi language and writing in Lianshan region). Wen You and Zhang Kun published a series of papers in *Huaxi Xuebao* (Bulletin of West China Union University) on the Qiang language. Rui Yifu's field survey on the Lisu language appeared as *Ji Lisu Yuyin Jianlun* *Suowei Lisuwen* (A phonetics of Lisu, with discussions on the so-called

Lisu script). Zhang Yisun, Yu Daoquan, and Jin Peng's study on the Tibetan language led to *Jiarongyu Yanjiu* (Study on the Jiarong language) by Jin.

40.3 EARLY DAYS OF THE PEOPLE'S REPUBLIC OF CHINA

In the early days after the founding of the People's Republic of China (PRC), the work on minority languages and writing centered mainly on the following.

40.3.1 Identification of Minority Ethnic Groups and Languages

Before 1949, only five ethnic groups—Han Chinese, Manchu, Mongolian, Hui, and Tibetan—were generally recognized. Upon the founding of the PRC, the government sent working teams to all parts of China to conduct diagnostic investigations. Identification of additional minority languages was implemented in combination with the identification of ethnic minority groups. By 1954, when Luo and Fu published their coauthored paper (Luo and Fu 1954), more than forty languages had been identified. It came to be understood that seventeen scripts were in common use by the minority peoples.

40.3.2 Formulation of Policies

In the first PRC Constitution adopted in 1954, each ethnic group was guaranteed to have the right to use and develop its own language and writing. Generally, there were three specific guidelines:

- (1) *Implementation of the ethnic and linguistic equality principles.* This ensured the protection of the general policy stated in the Constitution. The historical vestiges of discrimination toward minority languages and writings were thoroughly erased.
- (2) *Continuous development through use.* Standardization and improvement through language planning could facilitate social progress, following developments in science and technology, as well as an increase in educational and cultural level for each ethnic minority group in all areas.
- (3) *The principle of free choice.* The minority peoples were encouraged to learn their mother tongues. This would increase mutual understanding and strengthen unity among ethnic groups.

40.3.3 Invention, Reformation, and Improvement of Writing Systems

Creating and improving ethnic writing systems were the major accomplishments at this time. The difference between improvement and reformation, generally, lies in that improvement refers to the retention of the original orthography while making only some additions, replacement, or restandardization to the original alphabet, whereas reformation refers to the replacement of the original alphabet with another one.

- (1) *Comprehensive investigation.* In the early 1950s, language workers to ethnic minority areas throughout China successfully achieved ethnic identification and gained an overall picture of the distribution, number of speakers, usage situation, structural features, internal differences of minority languages, as well as their relationships with languages used by surrounding communities. In addition to on-site investigations, the language workers also convened a variety of colloquia attended by ethnic minority delegates from all sectors, soliciting their opinions on developing literacy and education. In 1953, a meeting was convened to discuss the issues pertaining to creating scripts for languages without a written form and formulation on various proposed scripts, and to personnel training, as well as the promotion of scripts devised. In 1956, seven teams were organized and dispatched by the state to different regions throughout China. By 1958, forty-six minority languages had been surveyed. Language data of some 1,600 locations had been collected. For each location, an average of 3,000 to 4,000 words in daily-life situations were collected. These working teams also mapped out the phonological system and collected several hundred sentences representing the overall grammatical system for each location. Longer discourses were also collected for some locations.
- (2) *Establishment of institutions.* The Institute of Ethnic Minority Languages of the Chinese Academy of Sciences was set up and responsible for organizing and directing the research of minority languages, including the creation of scripts. Thus an array of institutions was established in every province and some autonomous prefectures, including administrative agencies, academic institutions, as well as compilation and translation institutions, in order to facilitate the work on language planning.
- (3) *Training of personnel.* In 1956, immediately before the departure of the work teams, training sessions were held; trained linguists delivered lectures on the theories and approaches in collecting data from minority languages. Meanwhile, a number of programs for ethnic studies at several national and local colleges were established for the dedicated language faculty to teach and study the minority languages, as well as creating some scripts, thereby fostering a large number of experts specializing in teaching, translating, publishing their research works, as well as supervision and management of minority language planning.

- (4) *Invention and improvement of writing scripts.* In 1955, the First Academic Conference on Minority Languages and Writing was convened in Beijing, where attendees exchanged views and formulated the preliminary planning for minority languages and writing. First, the researchers discussed issues relating to dialectal division and decided on a basic dialect and the standard pronunciation for many ethnic groups. Based on the phonological system of a standard pronunciation, the experts put forward the draft proposals of the orthographies. Then extensive solicitation for opinions was conducted among delegates from all sectors of each speaker community. From 1956 to 1958, fifteen scripts based on the Roman alphabets were created for eleven ethnic minority groups, namely, Zhuang, Miao, Buyei, Yi, Li, Lisu, Naxi, Wa, Hani, Dong, and the Zaiwa subgroup of Jingpo. More than one script was necessary for the Miao and Hani due to great dialectal differences, specifically, three scripts for the dialects spoken by the Miao and two for the Hani. Improvements were made to the writing systems of Jingpo, Lahu, Dehong Dai, and Xishuangbanna Dai. Changes were made to the Pollard Miao script used in the Diantongbei Miao community, the original Yi script, the Uyghur script, the Kazak script, and the Mongolian script.

- (5) *Trial use and expansion.* When the proposal for a newly invented script was agreed upon, it was put to trial use in the community before submission to the State Ethnic Affairs Commission for adoption. A great deal of supporting work was carried out, including compilation of textbooks, supplementary reading materials, teaching materials, dictionaries, and bilingual glossary in Chinese and the minority language concerned. Initial bilingual education was carried out employing the minority language and Chinese. Most scripts were used in newspapers and magazines. Some new language standards were used in broadcasting. The use of every script was later expanded to be used even in government administration, judicial authorities, as well as trade and commerce.

Implementation of these policies in this period created many scripts for many minority languages without writing. Besides, in some communities the traditional scripts had been exclusively used for religious purposes only. New writing was then largely separated from religious activities; thereby, the script used in school education did not interfere with religious activities. Consequently, 80% to 85% of the minority population finally could develop their culture and be educated via their mother tongues.

40.4 THE ERA OF RADICALISM

Since 1958, the work on minority languages, like everything else in China, was disrupted continuously by radical ideology. At the Second Academic Conference on Minority Languages and Writing convened in 1958, the primary theme was nominally

to “summarize the achievements obtained in the work on minority languages in the past two years and solicit opinions on future work.” But the key was indeed to criticize the so-called “capitalist linguistic” trend in the work of minority language planning.

During the conference, many members of the work teams were criticized. The Chinese Academy of Sciences was accused of incorrect styles of work (for details, see Luo 2007). After 1959, the work on minority language planning was essentially halted, and language planners were transferred to work in other fields until the end of the Cultural Revolution

40.5 THE ERA AFTER THE CULTURAL REVOLUTION

From 1979 to 1980, the Third Academic Conference on Minority Languages and Writing was convened in Beijing. Afterward, the work on minority language planning resumed in the following areas:

- (1) *The damages redressed.* The policies on minority language planning were fulfilled in earnest once again as teaching, research, publishing, and translating of minority languages and writing were restored and reconstructed.
- (2) *Legislation.* Regulations at county, prefectural, and provincial levels on the management of the work on minority language planning were formulated and approved, basically enabling the use and development of ethnic minority languages in both spoken and written forms. Based on this, it is thus claimed that “Breakthrough progress has been achieved in the legislation of minority languages and writing” (Cultural Promotion Division of the State Commission on Minority Affairs 2006:567).
- (3) *Resumption of script creation and expansion of use.* In response to the request of some minority groups, phonetic script proposals were created for the Tu and Qiang languages. Meanwhile, professionals were organized to implement review and authentication on individual kinds of scripts created in the 1950s, which showed that trial use of all the scripts had reaped desirable results. Afterward, a request was submitted for official approval and promotion of these scripts. National standard character sets were formulated for most scripts, and proposals of standard character sets for some scripts were submitted and adopted by the International Standard Organization. Great progress has been made in the standardization, information processing, normalization, and network transmission for all minority scripts, especially those not based on Roman alphabet. The minority languages and writing are widely used to varying degrees in various domains, ranging over administration, jurisdiction, mass media, movies and TV programs, press, and publication.

(4) *Breakthroughs in the investigation, identification, and teaching of minority languages.* The number of newly identified languages has doubled that of the sixty-odd languages identified before the Cultural Revolution. To date, 135 languages have been officially recognized.

(5) *Establishment of institutions.* Interprovincial collaborative institutions have been set up, facilitating the implementation of the planning for minority languages and scripts. Several national institutions were also set up, further safeguarding the implementation of policies on minority languages and scripts and promoting the development of academic exchanges. An Office for Ethnic Minority Ancient Books was created in every province and autonomous region for collation, decipherment, and publication of minority ancient scripts and historical documents for the purpose of promoting the use and dissemination of traditional minority scripts and the preservation and inheritance of nonmaterial cultural heritages (for details, see Sun 2010). Attention was also paid to document, preserve, and rescue endangered minority languages by means of modern devices.

During this era, a team of ethnic minority administrators, specialists, and scholars are engaged in the administration, research, teaching, as well as compilation and translation of their mother tongues and scripts, constituting the most reliable force in carrying out policies and promoting and developing the work on minority languages and scripts. Their dedication brought out satisfying research results, including descriptive works, historical comparative linguistics, application studies, dictionary compilation, dialectal research, and database construction. Some 2,000 monographs and 22,000 papers have been published in this era.

40.6 MAJOR ACHIEVEMENTS AND FUTURE PROSPECTS

Although minority language work is, at its root, a cultural work of each ethnic group, it is also an important and integral component of the cultural development of the nation. The work will only be successful if the desires of each ethnic group are respected, with full participation by the minority peoples themselves, including their intellectuals. Language workers from the minority groups should be fully relied upon to develop the work. Permanent teams with specialists from each ethnic group should be established within each minority group. These specialists should understand the policies, have a high degree of professionalism, and participate in the language planning activities, thus ensuring the prosperity and development of minority language work. However, it is not enough to rely on the enthusiasm of the minority people alone; relevant government organizations must provide guidance and support in policymaking, as well as all the necessary technical expertise. Cooperation between government organization, minority language researchers, and minority communities is indispensable.

40.6.1 Policy Formulation and Legislation

As mentioned earlier, the most important component for minority language policy is stipulated in the constitution that "all ethnic groups are entitled with the right to freely use and develop their own languages and scripts." Correct policies must have a good understanding of the fundamentals concerning minority issues and be in touch with the social objectives of changing situations. Successful implementation of the policy will prevent arbitrariness and ignorance in the administrative instruction and supervision concerning minority languages, decreasing the number of errors that may occur in the resolution of specific issues.

The minority language planning activities cannot be simply managed through administrative measures but must be protected by legislation. Therefore, timely legislative activities are not only necessary but also pressing. Over the past years, the state has formulated a series of guiding principles and regulations regarding minority language planning, which have been written into the national constitution and the legislations of all the ethnic autonomous regions. However, more specific legislation in this respect has not been formulated yet. To date, such work has progressed at the discretion of changing individual local authority so that it is often difficult to ensure stability and continuity in language planning. Although the Standard Spoken and Written Chinese has been promulgated for more than a decade with legislative support at the national level, few provincial as well as prefectural and county regulations concerning the implementation of minority language and script have been formulated. There is still a lack of a national law to protect the use and development of the minority languages and script. Therefore, the work on minority languages, including script development, is still guided by a very vague general principle without operable details. Given the cultural diversity with a population of 100 million, the implementation of minority language planning should be on the formal agenda of legislatures at all levels to formulate a law that can effectively protect and guarantee the interests and desires of the ethnic minorities groups. No national unity, progress, solidarity, or prosperity in China can be accomplished without first accomplishing these tasks.

40.6.2 First-Hand Data Through Continuous Investigation for Researchers

Continuous investigation of minority languages on issues in language acquisition in relation to instruction, linguistic structures of each language, and differences of each minority group with regard to the usage situations is a most crucial basis for any planning activity. Only with a great deal of firsthand data can the planners have a clear and fair understanding of the whole picture of the situation and plan on a solid basis. Both the diagnostic investigation conducted in the early 1950s and the later large-scale

language investigation implemented have already provided substantial firsthand data for policy decisions on creating, improving, and reforming minority scripts. In the 1980s, in light of the newly emerged needs, research was undertaken on the usage situation of minority languages and writing, on bilingual education, as well as the communication needs of some cross-border minority languages. In the 1990s, investigation and review were implemented on the newly created and the improved scripts. In recent years, the focus has been put on the endangered languages.

Minority language research must follow the natural changes and developmental trends within each language to enable systematic policymaking on the minority languages. Researchers can only succeed if they have obtained a correct understanding of the objectives with clear instructions.

The method on minority language planning should be practical and realistic and be case- and situation-specific. No uniform program should be applied to all minority groups regardless of their distinctive needs. The real-life situation can be changing constantly. Only policies that can effectively help solve some urgent matters in real-life situations can be implemented with great determination and confidence, as the programs accordingly formulated can meet the needs in each individual case. This requires a high degree of professionalism and a strong sense of responsibility on the part of government organs and minority language planners. They must often conduct field trips in order to acquire a comprehensive understanding of the area under their supervision and identify the cause and effect of an issue in each case before coming up with a problem-solving solution. They should be able to adjust their priorities and deploy their resources properly according to different needs at a different time or place in order to adapt their policy. The essential component in implementing a case-by-case supervision consists in being able to acquire a comprehensive overview of the situation as well as to work out incisive, accurate, and timely solutions to the specific problems in promoting language planning in minority languages.

40.6.3 The Principle of Free Choice

The role of minority language planning was viewed in the past simply as a tool for communication and the exchange of ideas, and its role in the transmission of information concerning new commercial products and popularization of science was largely neglected. This role in information transmission is especially important in the present era when the commodity economy proceeds apace in China. As a result of wider use of minority language, information about new commercial products can be transmitted rapidly, and practical knowledge in science and technology can be popularized, thus leading to rapid alleviation of poverty and economic prosperity in all the ethnic groups.

The positive benefits of minority language planning have also failed to recognize, in the past, its importance in the maintaining the cultural heritage of the ethnic minority groups and its role as a most effective tool in boosting the educational level of the people

in an ethnic group. Language, in particular its script, is an important distinctive feature of a people and has an enormous role in raising a people's self-confidence. The request of a minority people for the creation of their own script is an expression of their improved self-awareness and self-awakening.

There are thirty-two cross-border ethnic minorities in China. Although identical writing systems are employed by some groups within and outside China, the majority have different scripts. This is especially so for the southern minority groups, with scripts of distinct forms used by the same group inside and outside China. In other cases, scripts used by the minority groups living outside China are different from within, or vice versa. Nowadays with increased cross-border communication and socialization, this issue of same language with different script has become even more prominent. Some of these ethnic groups are requesting a change to adopt script of those employed outside China; these requests have to be dealt with properly after careful deliberation.

40.7 CONCLUSION

Bilingual education based on the distinctive features of a certain area is proven to be well suited to situation in China. Vigorously safeguarding the use and development of the minority languages by using the mother tongue as the medium of instruction can lead to a rapid increase in the educational level of the people in minority areas. It greatly enhances the intellectual development of the children and increases school enrolment rates. The percentages of student enrollment and graduation rates are now higher in minority areas. In addition, the ability in reading and writing in their own language also greatly promotes the learning of spoken and written Chinese by the minority peoples for effective communication with the people from other ethnic groups.

Accompanying the current trend of globalization and the increasing needs to communicate with the people from other countries in a foreign language and other Chinese people in a common language, ethnic minority languages are faced with an acute problem in language endangerment, irrespective of people's wishes. Ethnic minority language planning ought to provide a solution to this new problem. The vigorous enforcement of the law on Standard Chinese not only enables the common national language to be transmitted and used extensively among the citizens but also enables all the minority peoples to develop a prosperous career in the country. The establishment of a harmonious multilingual society should therefore be the goal. All ethnic minority languages will coexist harmoniously with the common national language, and multiple languages will be used simultaneously in a community, each having its unique roles, strengths, and usage domains. This is a major issue that members of each ethnic group are now treating as a top priority in the protection of linguistic and cultural diversity.

APPENDIX I

GENETIC CLASSIFICATION OF LANGUAGES IN CHINA

1. **Sino-Tibetan Family**
 Chinese (Sinitic languages)
 Tibeto-Burman subfamily
 Tibetan branch: Tibetan, Moinpa, Baima, Cangluo
 Yi (Loloish) branch: Yi, Lisu, Lahu, Hani, Jinuo, Naxi, Tanglang, Mò'ang, Sangkong, Bisu, Kazhuo, Rouruo, Nusu, Sadu, Tujia, Bai
 Jingpo (Kachin) branch: Jingpho, Dulong (Durrung), Geman, Darang, Anong, Yidu, Bogar, Sulong, Bengru
 Burmish branch: Achang, Zaiwa, Langsu, Xiandao, Bola, Leqi (Lachit)
 Qiangish branch: Qiang, Pumi, Jiarong, Muya, Ergong, Ersu, Namuyi, Shixing, Zhaba, Guqiong, Lawurong, Queyu
 Kam-Tai subfamily
 Zhuang-Dai (Tai) branch: Zhuang, Bouyei, Dai, Lingao (Ong-be), Biao
 Dong-Shui (Kam-Sui) branch: Dong (Kam), Sui, Muolao, Maonan, Mo, Yanghuang, Lakkia, Chadong,
 Li branch: Li (Hlai), Cun, Nadou
 Geyang branch: Gelao, Buyang, Pubiao, Laij, Bugeng, Mulao, Caijia
 Miao-Yao (Hmong-Mien) subfamily
 Miao branch: Miao, Bunu, Baheng, Jiongnai
 Yao branch: Mien
 She branch: She, Bana
2. **Altaic Family**
 Turkic subfamily
 Western Hunnish branch: Uyghur, Kazak, Uzbek, Salar, Kirgiz, Tatar,
 Eastern Hunnish branch: Western Yukur, Tuva, Turk,
 Mongolian subfamily
 Mongolian, Tu, Daur, Dongxiang, Bao'an, East Yukur, Kangjia
 Manchu-Tungusic subfamily
 Manchu branch: Manchu, Xibo, Hezhen
 Tungusic branch: Ewenki, Orogen
 Unclassified ones: Korean
3. **Austronesian Family**
 Amis, Paiwan, Bunun, Atayal, Saisiyat, Basehai, Pazeh, Thao,
 Rukai, Tsou, Kavalan, Sedeq, Puyuma, Yami, Saaroa,
 Kanakanavu, Huihui

4. **Austroasiatic Family**
 Mon-Kemer subfamily
 Wa, De'ang, Bulang, Kemu, Kenir, Bumang, Buxing, Hu
 Viet-Muong subfamily
 Jing, Muong, Lai
5. **Indo-European Family**
 Tajik, Russian
6. **Mixed Languages:**
 Wutun, Tangwang, Wuse, Zhahua, Daohua, Ainuhua

APPENDIX II

SCRIPTS USED IN CHINA

1. **Scripts based on Chinese characters**
 Chinese script, Tangut script, Big Khitan script, Small Khitan script, Jurchen script, Square-shaped Zhuang script (*Sawndip*), Square-shaped Dong script, Square-shaped Bouyei script, Square-shaped Maonan script, Square-shaped Bai script, Square-shaped Miao script, Square-shaped Hani script, Square-shaped Kelao script, Square-shaped Miao script, Chu Nom script
2. **Scripts based on Devanagari alphabet (Phonetic scripts based on Sanskrit alphabet)**
 Tibetan script, Phags-pa script, Xishuangbanna Dai script, Jinping Dai script, Dehong Dai script, Daibeng script
3. **Scripts based on Arabic alphabet**
 Uyghur script, Kazak script, Kyrgyz script, Chagatay script, Syrian script
4. **Scripts based on Aramaic alphabet (Aramaic-Sogdian-Uyghur scripts)**
 Mongolian script, Manchu script, Xibo script, Huihu (Old Uyghur) script, Kharoshthi script, Sogdian script, Turkic script
5. **Scripts based on Brahmic alphabet**
 Argi-Kucha script (Tocharian script), Khotanese
6. **Script with Hummin Jeongeum alphabet (Hangul or Han-krur)**
 Korean script

7. **Phonetic scripts based on Roman alphabet**
 Zhuang script, Buyei script, Dong script, Li script, Qiondong Miao script, Xiangxi Miao script, Chuanqian Miao script, Diandongbei Miao script, Lisu script, Wa script, Hani script, Naxi, Jingpho script, Zaiwa script, Lahu script, Tuzu script, Qiang script, Bai script, Tujia script, Dulong script, Formosan scripts: scripts used by the Austronesian-speaking aboriginal groups in Taiwan
 Phonetic scripts based on variant Roman alphabet (created by foreign missionaries for use in minority areas in China): Pollard script (or Old Diandongbei Miao script), Traditional Lisu script (Fraser Lisu script), Jingpo script, Sala Wa script

8. **Indigenous minority writing systems**
 Old Yi script used in Yunnan, Guizhou and Sichuan provinces, Standardized Liangshan Yi script, Naxi Dongba script, Naxi Geba script, Naxi Ruka script, Ersu Shaba script, Lesui script, Lisu Syllabic script, Malimasa script

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CHAPTER 41

CHINESE WRITING AND
LITERACY

FENG WANG AND YACHING TSAI

41.1 OVERVIEW

CHINESE literacy is closely linked to *hanzi* or Chinese characters. It is well known that the *jiaguwen* 'oracle bone inscriptions' from the Shang Dynasty is the earliest form of Chinese writing dating from 1400 BCE. In Chinese history, Xia is the first dynasty to be documented in ancient texts. It is intriguing whether there is already a writing system in Xia as the precursor of *jiaguwen*. Many symbols found recently on unearthed objects are speculated to be ancestral to *jiaguwen*, including the abstract signs etched on pottery at *Banpo* (5000–4500 BCE) and *Dawenkou* (4300–2500 BCE) (Li and Guo 2002), and the nearly 300 symbol-like patterns in the *Sanxingdai* cultural relics (1800–800 BCE). Though these speculations await verification, it would not be surprising if some primitive forms of writing were to be uncovered. Given the maturity of *jiaguwen*, it could not have come suddenly from nowhere. The subsequent dynasties mostly follow the *jiaguwen* writing of Shang with some modifications.

Other types of script in China appear much later than Chinese characters. For example, the Tangut script was created in the 11th century CE, which followed the logographic system of Chinese (Gong 1982). Interestingly, the Xixia people used both Tangut and Chinese until their defeat by the Mongolians in 1227 CE and the Xixia script went out of use. The Bai people in southwestern China borrowed Chinese characters and created new ones according to the principles of Chinese character formation. However, the use of the Bai script was never quite comparable to the Chinese characters in terms of the extent, range, and influence. In southern China, minorities like Zhuang, Miao, and Yao all invented their scripts in a similar manner. The influence of the Chinese script even went beyond China's borders to reach neighboring nations, as they were exported to the Korean peninsula as early as the Warring States period (403–221 BCE). Later, in 1486, Hangul was invented as the standard writing to replace

Chinese characters in Korean. Vietnamese used Chinese characters as the only script from approximately the 1st to the 13th century CE. Japanese borrowed many Chinese characters, and later on components of some characters were used in their *Katakana* and *Hiragana* systems to represent sounds of indigenous Japanese words. In fact, all of the three languages established their own phonological rules to read the borrowed Chinese characters.

Nonetheless, not all the scripts used in China are due to the influence from the Chinese character system. Written Tibetan was modeled on Indic scripts around the 7th century CE and was since modified three times by the 9th century. The Mongols adopted modified Uyghur alphabets as their first script. The emergence of two independent scripts in southwestern China is noteworthy. One is the Tomba script of the Naxi people, who use a kind of hieroglyphs very close to drawings and clearly an early stage in its development¹. The other is the Yi script by the Yi people, which presumably originated from pictographs, but most symbols are used phonetically. The date and process of the creation of Yi script are controversial, though a few scholars have tried to link Yi scripts to symbols etched on excavated objects, especially those from the prehistoric *Sanxingdai*.

41.2 CHINESE CHARACTERS AND CHINESE
LITERACY

Chinese characters are morphosyllabic (Wang 1973; Qiu 1988). A character represents a syllable rather than a phoneme, and each syllable generally represents a morpheme, the smallest unit of phonetic-semantic combination, for example, *tian* 天 'sky' and *di* 地 'ground'. Occasionally, a morpheme is represented by more than one character, such as *paivuai* 徘徊 'to wander' and *menglong* 朦朧 'dim'. In this case each single character still corresponds to a syllable but has no meaning by itself. Most Chinese characters can be broken down into smaller parts: signfic radical and phonetic radical. For example, 洋 *yang* 'ocean' is made up of the signfic 氵 'water' and the phonetic 羊 *yang* 'sheep'. Some Chinese characters may only have the semantic, such as 水 *shui* 'water' and 本 *ben* 'root'. Another type of Chinese character originates from phonetic loan (*jiqie* 假借). For instance, 其 originally meant 'winnowing basket'. Later, it was borrowed to indicate the demonstrative pronoun 'that' because of sound resemblance. For the latter usage, 其 serves only as a phonetic sign (Qiu 1988:97–109). Pictographic may be truly a common feature of the early Chinese characters. Nevertheless, such a strategy in forming characters is not particularly productive in expressing abstract concepts. Phonetic loan and characters that combine a signfic radical and a phonetic radical enhance the ability of the writing system to represent spoken Chinese. About 85% of Chinese characters are formed using this latter strategy. Thus it seems inaccurate to define the system as logographic.

As for the origin of Chinese characters, there exist different legendary stories. According to some Taoist fairy tales, Chinese characters were designed by Cangjie inspired by traces left behind by birds; others say Chinese characters evolved from knotting strings for records or from the *Bagua* 'Eight trigram'. These stories make the creation of Chinese characters all the more mysterious. In reality the fundamental function of writing is to keep records, as shown in the earliest records of *Jiaguwen*. They are used to record divinations describing the activities of the ruling class who find themselves helpless and in awe of the power of nature/heaven. A complete record usually consists of four parts: *qianci* 前辞 'prologue', *zhenci* 贞辞 'interrogation', *zhanci* 占辞 'prognostication', and *yanci* 验辞 'verification'. These parts state the date and place of a given divination, the question from the king or nobles, the answer from the shrine of god, and the actual result later. Such language is better regarded as track records rather than supernatural messages because the highly respected heaven represents nature, not god, in the mind of the Shang people (Chen 1956).

The ancient character for writing tools is 𠄎, which represents an image with a hand holding a brush pen (Qiu 1988:42). In the book of *Shangshu* 尚书, chapter *Duoshi* 多士, it is said "only the ancestors of the Yin people possessed writing volumes" (*wei yin xian-ren* 惟殷先人, *youce youdian* 有册有典). The ancient shape of 册, 册, was made of bamboo slips. Since writings in brush pen could not be preserved due to the perishable material (Qiu 1988), records carved on animal bones became important documentation.

Another type of writing developed in the Shang Dynasty was the inscriptions on bronze *jinwen* 金文 used on formal occasions. In comparison, oracle bone inscriptions were the variant in ordinary life, called *suti* 俗体 'vulgar type'. Note that the earlier vulgar type eventually became the regular type (Qiu 1988:44). During the Warring States period, two types of script developed. One was the Qin type following the tradition of Western Zhou (1066–771 BCE), but the characters were modified to be more symmetrical and less pictorial. The earlier Qin type was called *Shiguwen* 石鼓文 'stone-drum script'. It was later simplified to become *Xiaozhuan* 小篆 'small seal script'. The others were the much divergent Six-State types. After Qin conquered the other six states in 221 BCE, the first emperor *Qinshihuang* 秦始皇 legalized the small seal as the standard writing of China. This famous historical event is known as *shutongwen* 书同文 'writing in the unified characters'.

From Qin (221–207 BCE) to Han (206 BCE–220 CE), *Lishu* 隶书 'clerical script or scribe character' replaced small seal and the strokes became simpler and smoother. This greatly improved the speed of writing. During the Han–Wei–Jin period (206 BCE–420 CE) clerical script became the most popular type. In Nan–Bei–Chao 'Southern and Northern dynasties' (420–589 CE), *Kaishu* 楷书 'regular script' became the major form and persists until today. Meanwhile two other types, *Xingshu* 行书 'the running script' and *Caoshu* 草书 'the cursive style' emerged, but they did not become the standard script.

The several major shape changes following *Jiaguwen* are shown in Figure 41.1.

Standardization and simplification are two major directions in the development of Chinese characters. *Qinshihuang's* unification established the foundation for later standardization. Three books, *Volumes on Cangjie* 仓颉篇, *Boxue* 博学篇, and *Yuanli*













| Regular forms | | Script forms | |
|---|---|---|---|
| Tiger | Dragon | Tiger | Dragon |
|  |  |  |  |
| Ancient graphs about 2000 B.C. | Shell-and-bone characters <i>jiaguwen</i> about 1400–1200 B.C. | Great seal <i>dazhuan</i> about 1100–300 B.C. | Small seal <i>xiaozhuan</i> 221–207 B.C. |
|  |  |  |  |
| Standard characters <i>kaishu</i> about A.D. 100–present | Simplified characters <i>jianzhi</i> about A.D. 100–present | Scribe character <i>lishu</i> about 200 B.C.–A.D. 200 | Running style script <i>zhangcao</i> about 200 B.C.–A.D. 1700 |
|  |  |  |  |
| Documentary script <i>zhangcao</i> about 200 B.C.–A.D. 1700 | Running style script <i>xingshu</i> about A.D. 200–present | "Modern" script <i>jincao</i> about A.D. 300–present | Erratic script <i>kuangcao</i> about A.D. 600–1700 |

FIGURE 41.1 The evolution of Chinese character types (from Wang 1973)

爰历篇, written by the top three advisers, Li Si 李斯 (280–208 BCE), Hu Wuqing 胡毋敬, and Zhao Gao 赵高 (?–207 BCE), were published as the model of standardized writing. During the Han Dynasty, the proposal by Cai Yong 蔡邕 (132–192 CE) to engrave Confucian classics on stone tablets as the standard script was adopted. Beginning in 175 CE, it took nine years to engrave seven classics (*Jingjing*) in the clerical script on forty-six stone tablets: *Shi* 'Book of Songs or Odes', *Shu* 'Book of Documents', *Li* 'Book of Rites', *Yi* 'Book of Changes', *Chunqiu* 'Spring and Autumn Annals', *Gongyang's* 'The Commentary of Gongyang', and *Lunyu* 'Analects'. It is called *Xiping Shijing* 熹平石经. In the same spirit, *Santi Shijing* 三体石经 (240–249 CE), *Kaicheng Shijing* 开成石经 (830–837 CE), and *Shisanjing Shijing* 十三经石经 (1791–1794 CE) were inscribed. The famous *Shuowen Jiezi* (121 CE) by Xu Shen 许慎 (c.58–147 CE) with 9,353 Chinese characters marks the beginning of unifying character shapes through dictionary compilation. In the Ming

Dynasty (1368–1644 CE), *Zihui* 字汇 (1615 CE) by Mei Yingzuo 梅膺祚 reorganized 33,179 Chinese characters. Such dictionaries collected variant forms and told readers how to write Chinese characters correctly (Wang 2004).

At the beginning of the 20th century, the Chinese characters with a history of several thousand years met its greatest challenge. Aspiration for modernization called for the reform and abolishment of the Chinese writing system, since Chinese characters were widely regarded as the essence of the much-criticized backward Chinese tradition. A Latin orthography in China after the abolishing of Chinese characters was advocated over the 1919 May Fourth Movement. However, such an idea did not gain much support from different sectors of the Chinese communities, since Chinese characters are the single bearer carrying a long cultural tradition that has lasted for more than three millennia, not to say that it has been an effective writing system that transcends all the dialectal differences at all this time.

The People's Republic of China government tried to further simplify and standardize the script. In 1955, 810 sets of variant forms were published, and one from each set was legalized. For instance, of the three forms 杯, 盃, 椀 for 'cup', only the first was adopted. Such decision discarded 1,053 characters.³ In 1956, the Chinese Characters Simplification Scheme (汉字简化方案) was promulgated to simplify and regulate the character components in mainland China. The traditional type, called Complex characters, is thus distinguished from the new Simplified characters. However, Complex characters are still used in Taiwan, Hong Kong, and Macao. The "Four Standardizations" of Chinese characters were proposed in 1986 to facilitate computerization of the writing system: standardization of the total number (*dingliang* 定量), standardization of the forms (*dingxing* 定形), standardization of the pronunciation (*dingyin* 定音), and standardization of the order of arrangement in dictionaries (*dingxu* 定序). However, these four standardization procedures encountered difficulties from both the sociocultural and technical aspects. Digitalization of the Chinese characters, especially *chongma* 重码 'homophonic occurrence' and *luanna* 'unintelligible decoding,' poses a great challenge to Chinese language planning in the information age of the 21st century (Zhao and Zhang 2007; Zhao and Baldauf 2008).

Since the Chinese orthography is nonalphabetic, its relationship with the spoken language is very interesting. The use of *jiaguwen* was limited to the elite class of the Shang Dynasty in central China (around the modern Henan province) where the spoken language was highly homogenous. But given that all languages change with time and space, some minor dialectal differences can even be traced to the rhyming of *Shijing* (Baxter 1992). In the Han Dynasty, the divergence of the spoken language was salient enough to be noticed by Yang Xiong 扬雄 (53 BCE–18 CE), who compiled *Fangyan* 方言⁴ with a collection of different features from various dialects. With frequent migrations, the Chinese language split into seven major dialect groups (see chapter 11 in this volume). Mutually unintelligible dialects are sometimes treated by many as different languages. Although there have been several major changes involving the shape of the Chinese characters, their basic structure survived all of the changes. Furthermore, the Chinese characters with a nonspelling system that was once considered as undesirable

demonstrate its strength and vitality, strangely for exactly the same reason. A Chinese character that is not directly related to speech sounds can be easily pronounced in different dialects. This has enabled a character with the same meaning to cross time and space. For example, 日 is pronounced [ɲit] in Old Chinese, [nyit] in Middle Chinese, [ʒɲ⁵] in Beijing Mandarin, and [jaat³] in Guangzhou Cantonese with the same meaning 'sun' in spite of diversity in pronunciation.

On the other hand, the effort to promote a common language across China has never ceased. As early as the Xia Dynasty, it was recommended that the so-called "Elegant speech" (*Yayan* 雅言), spoken around the Yellow River, should be used to read,⁵ not those languages in Yue⁶ and Chu.⁷ In Yang Xiong's *Fangyan*, the common language, *Fanyu* 凡语 or *Tongyu* 通语, is clearly distinguished from other languages. In the *Sui-Tang* (581–907 CE) period, a rhyme book, *Qieyun* 切韵, was compiled to consider "the right and the wrong pronunciations of the South and the North" (南北是非) and "the prevailing and the obsolete pronunciations of past and present" (古今通塞) (Ting 1998). All literate people should follow the rhymes of this book in composing poems. *Qieyun* was later modified slightly to be used in the Tang Dynasty (618–907 CE), called *Tangyun* 唐韵, and later still updated as *Guangyun* 广韵 in the Song Dynasty⁸ (960–1279 CE). As *Guangyun* preserved the phonological system of centuries ago, a great discrepancy emerged between the literary reading and the spoken language. Ding Du 丁度 (990–1053) simplified the 206 rhymes of *Guangyun* into 108 to produce the new rhyme book *Libu Yunlie* 礼部韵略. In parallel *Hongwu Zhengyun* 洪武正韵 and *Peiwen Shiyun* 佩文诗韵 were compiled respectively in the Ming and Qing dynasty (1644–1911 CE). However, in order to "respect the ancestors," the two later modifications took little consideration of the current spoken languages. The gap between the written and spoken languages became increasingly larger over time.

Putonghua 普通话 'common language' as the national language of China was officially adopted in 1955, which sets its standards with the Beijing accent, the lexicon of the Northern Mandarin, and the syntax of modern fiction and drama. In 1958, the Chinese Pinyin Scheme (汉语拼音方案) was issued to transcribe Putonghua with Roman letters. It makes use of twenty-six Latin letters and four tonal symbols to indicate twenty-one initials and thirty-five finals. An apostrophe is also used to indicate syllable boundaries; for example, the two-syllable city name *Xian* 'the capital of the Shaanxi province' as opposed to the one-syllable *xian* 'county'. Table 41.1 shows the initials with different transcription systems (the symbol under the Roman alphabet with IPA is the *Zhuyin Zimu*, followed by a Chinese character example).

Tones are indicated by diacritical marks over the main vowels, as in *mā* 'mother', *má* 'heaven', *mǎ* 'horse', and *mà* 'scold'. The neutral tone is unmarked as *ma* 'interrogative particle'. These tonal marks coincide with their fundamental frequency contours (Level, Rising, Falling-Rising, and Falling, respectively; cf. Wang 1973). The *Zhuyin Zimu* (or *Zhuyin Fuhao*) 'symbols of phonetic notation' was created in 1913 and is still used in Taiwan now. In 2008, the Taiwanese government suggested adopting Hanyu Pinyin as the official Romanization to gradually replace all other transcription systems, but this decision has been harshly criticized by the opposition party. Nowadays, the Pinyin

Table 41.1 The initials in the Romanization Project

| | | | | | | |
|----------|----------|----------|---------|---------|---------|---------|
| b[ɲ] | p[ɲ] | m[m] | f[f] | t[t] | ŋ[ŋ] | l[l] |
| ㄅ bō | ㄆ fō | ㄇ mō | ㄈ fō | ㄊ tō | ㄍ ŋō | ㄌ lō |
| ㄉ dō | ㄎ kō | ㄏ hō | ㄐ kō | ㄑ qō | ㄒ xō | |
| ㄓ zhō | ㄔ chō | ㄕ shō | ㄌ lō | ㄔ tō | ㄕ sō | |
| ㄗ zhō | ㄛ ō | ㄜ ō | ㄞ ō | ㄟ ō | ㄠ ō | |

system is taught at the beginning of primary school in mainland China. Textbooks for the first two grades are all notated in Pinyin to help children to read. Since Pinyin is intended for Putonghua, its promotion also results in bilingualism in most areas of China.

For thousands of years, Chinese characters are taught in the style of "whole-word" reading for beginners. After learning some basic Chinese characters, the method of inducing the phonetic and semantic information from the characters is introduced. The three traditional textbooks for reading are all rhymed: *Qianziwen* 千字文,⁹ *Sanzijing* 三字经¹⁰, and *Baijiaxing* 百家姓¹¹. All these texts are organized in either three or four characters because short sentences with simple consistent rhythms make it easier for the children to commit them to memory. After the primary stage, students turn to the classics. From Western Han (206 BCE–9 CE), five books by the Confucian scholars were designated as 'classics'¹², for example, *Shijing*, *Shujing*, *Liji* (later split into *The Three Ritual Classics of Zhouli* 'Rites of Zhou', *Yili* 'Ceremonies of Rites' and *Liji*), *Yijing*, *Chunqiu* (later split into *The Three Commentaries of Zuozhuan* 'The Commentary of Zuó', *Gongyang Zhuan* 'The Commentary of Gongyang' and *Guliang Zhuan* 'The Commentary of Guliang'). In Eastern Han (25–220 CE), two more classics, *Lunyu* and *Xiaojing* 'Classic of Filial Piety' were added. Knowledge of nine classics¹³ was tested in the imperial examination *keyu* starting from the Tang Dynasty. *Mengzi* 'Book of Mencius', along with *Eryu*, was added to the list in the Song Dynasty. The term 'Thirteen classics' was then established for the generations to come. Meanwhile, scholars like Zhu Xi 朱熹 in the Song Dynasty selected four important textbooks of Confucianism, thus there are the "Four Books: *Daxue* 'Great Learning', *Zhongyong* 'Doctrine of the Mean' (two chapters from *Liji*), *Lunyu*, and *Mengzi*. They became the required reading in primary education and the basis in the imperial exams. The Confucian classics have shaped much of the Chinese thought because of the influence ever since. Candidates for these exams needed to understand the classics and to provide their interpretations in the exams in order to become a public servant in Imperial China. These classics of *jing* were later included in *Sikuquanshu* 'A Complete Library of the Four Branches of Literature'. Completed in 1782, it is the world's largest series of books, which include also the other three traditional divisions of Chinese learning: *Shi* 史 'history', *Zi* 子 'philosophy', and *Ji* 集 'literature'. In total, there are 3,503 books with 79,337 volumes. Late in the Qing Dynasty, the imperial exam was abolished. In mainland China, a new subject of Chinese

study was created in 1949, called *Yuwen* 'spoken and written languages', and it is a compulsory subject from the primary school to high school.

The developments of the Chinese scripts are closely tied to the developments of the writing instruments. The earliest writing found in China was done on hard surfaces like animal bones, turtle shells, bronze, jade, and stone. Such materials could not keep up with the fast-increasing needs of writing. Then, bamboo or wood slips were used for an extensive period of time until the invention of paper by Cai Lun 蔡伦 in 105 CE. Silk was also used from 400 BCE to 500 CE (Ma 1977). Once the light and cheap paper became available, it became most popular not only in China but around the world. On top of a hard surface such as bone or shell, one can only "curve or inscribe" instead of write. The Chinese started to truly write on soft materials like bamboo slips, silk, or paper with a brush. Early in the Han Dynasty, calligraphy with a brush became artwork (Zhu 1984). Ever since, interests and studies on calligraphy as art have been growing. In the course of learning, simple characters with a minimal number of strokes have been chosen to teach children at first. For example:

上大人，丘乙己。化三千，七十士。尔小生，八九子。佳作仁，可知礼也。

Once the basic strokes are mastered, children are taught to copy a model of some famous calligraphers to cultivate in them the aesthetic appreciation of writing with a brush.

Printing was invented in approximately 700 CE, accelerating thus the diffusion of Chinese literacy. Ancient books were written top-down from right to left, which seems to follow the tradition of writing on bamboo slips. In 1950s, probably in response to the modern needs in printing literature written in alphabetic languages, the direction was switched to write and print from left to right in horizontal rows in mainland China. However, with respect to the belief in the advantage of writing and printing from left to right in promoting reading and thinking, it still awaits further studies.

41.3 WHY CHINESE CHARACTERS?

The basis for Chinese literacy lies in Chinese characters. Since their creation several millennia ago, the Chinese characters have been read and written by billions of people. The morphosyllabic nature of Chinese characters helps overcome temporal and spatial differences. The monosyllabic nature can be traced back to the *Shijing* times (Ting 2000), even though an iambic system was argued for the Old Chinese (Sagart 1999). As described earlier, a Chinese character might be pronounced differently by people from different periods or areas, but all dialects share the same writing system. Since phonetic clues provided in the phonetic part of a Chinese character are minimal, there is no need to change the structure of Chinese characters even when the sound has changed. Consequently, the continuity of the Chinese character system played an important role in uniting China and the Chinese culture as a whole. The tremendous number of documents

written with Chinese characters represents a valuable cultural heritage to all Chinese speakers who share the same orthography.

On average, the degree of homophones in Chinese is 7.85. This number is significantly high and causes the problem of *chongma* in computer science. But homophones are efficiently differentiated by different characters, for example, 弟、地、弟、遒、帝、緝. In this case, the same pronunciation *di* is shared by six characters with totally unrelated meanings. Calculated in terms of entropy in information theory, Chinese character entropy is almost ten bits (Feng 1989), nearly twice the amount in other written languages. Whether the high entropy counts as a merit or drawback, it remains a unique feature of Chinese characters among the world's writing systems.

The strong connection between a syllable and a morpheme can be illustrated by the example *pipa* 琵琶 'a Chinese plucked-string musical instrument', which is originally a disyllabic morpheme with two characters. Later the two syllables were separated and used to combine with other morphemes, so now there are such compounds as *piliu* 琵琶鹧鸪 (a kind of birds), *payin* 琵琶音 'arpeggio (a music term)', and so on. It seems that the Chinese character system is a powerful mechanism to normalize those irregularities into the regular match of one syllable/one morpheme. Such integration is called *hanzilization* (cf. Chen 1999:371).

Another fascinating question that arises is whether Chinese reading would make a Chinese mind different from that of the other languages. Via various experiments, it is found that in the processing of Chinese characters, more visual memory is involved than in the processing of alphabetic script (Tzeng and Wang 1983). However, such difference only occurs in the very beginning of recognition (Seidenberg and Tanenhaus 1979; Hung and Tzeng 1981). One finding contradictory to our intuition is that reading Chinese characters involves access to phonological information as any other type of writing system does (Tzeng et al. 1977; Treiman 1981; Polich et al. 1983). However, training of phonetic spelling does significantly affect phonological awareness (Hanley et al. 1999). Both Pinyin and Zhuyin Zimu are helpful in increasing the phonological awareness of Chinese children. Now, with advanced technology in neuroscience, brain waves and fMRI are used to explore the secret of the brain. Hopefully we will soon gain more insight into how Chinese characters are processed in the brain.

NOTES

1. The Tomba script is probably used for recording the Tomba classics from mid-11th century CE on, but dating its creation is difficult (Fang 1985).
2. The date of his birth and death is not clear.
3. cf. Diyiipi yitizi zhenglijibiao 第一批异体字整理表 'The First Table of Regularized Variant Chinese Characters' was issued by Ministry of Culture of China and Committee for Language Reform of China.
4. The complete title is 輶軒使者絕代語釋別國方言.

5. *Lunyu* (论语): What Confucius frequently discoursed were the Odes, the History, and the maintenance of the Rules of Propriety. On all these he discoursed in the elegant speech. (子所雅言, 诗、书、执礼, 皆雅言也).
6. Nowadays, Jiangsu and Zhejiang province.
7. Nowadays, Hubei and Hunan province.
8. The new version is titled 大宋重修广韵.
9. Compiled by Zhou Xingsi 周兴嗣 in Nan-Bei-Chao, it contains 250 four-character lines, and the common knowledge of that time is well covered.
10. It appeared in the Song Dynasty.
11. It appeared in the Song Dynasty. It consists of 472 Chinese surnames.
12. *Yuejing* 'Book of Music' was included originally but was eventually lost.
13. The nine works that are exactly referred to vary according to different sources.

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CHAPTER 42

DESIGN AND DELIVER

Teaching Students to Communicate

T. RICHARD CHI

42.1 INTRODUCTION

THROUGHOUT the 1980s and 1990s, a common practice in curriculum design was to let the textbook guide and determine the pedagogical thinking and instructional approaches for the course. And authors of textbooks often did not articulate explicitly the strategies for instruction, the learning outcomes expected of the students, and the assessment needed to measure learner progress. The early research on communicative competence and performance (e.g., Hymes 1972; Savignon 1972; Canale and Swain 1980; Canale 1983; Ellis 1985; Bachman 1990) did not make a meaningful impact on teaching Chinese as a foreign or second language. Curriculum design and classroom practices were dominated, both conceptually and practically, by learning through rote memorization, context-free grammar instruction and exercises, and translation.

The ACTFL Proficiency Guidelines for Speaking (1986) and the Oral Proficiency Interview assessment tool, which uses the Speaking Guidelines as criteria for measuring learners' speaking proficiency, as well as the Oral Proficiency Interview workshops throughout the next two decades drew the distinction for language teachers between *what the students know* and *what the student can do with what they know*. Teachers and programs began to experiment with designing curricula using the level descriptions in the ACTFL Proficiency Guidelines for setting learning goals, and some researchers (e.g., Bachman and Savignon 1986), began studying and critiquing the efficacy of the ACTFL Oral Proficiency Interview as a tool for measuring spoken language proficiency.

The publication of the *Standards for Foreign Language Learning in the 21st Century* (1999) and the *ACTFL Performance Guidelines for K-12 Learners* (1998) made a major impact on foreign language curriculum design in the United States. The emphasis of curriculum design is on aligning with the national standards in communication, cultures, connections between language and other disciplines, comparisons of the learner's

language and culture and those studied, and the learning and use of language in communities. The goals for curriculum design are to articulate explicitly the learning objectives; outline clearly the content and skills of the course; and select and prepare instructional resources, including materials, strategies, and learning activities. The assessment segment of the course, both formative and summative, is criterion-referenced and evidence-based.

42.2 ORGANIZING PRINCIPLES FOR A CURRICULUM FRAMEWORK

The following is a set of organizing principles recommended for curriculum design. These principles illustrate the characteristics of standards-based curriculum and assessment.

42.2.1 Alignment with the National Standards¹

The core of the national standards is composed of the five Cs: Communication, Cultures, Connections, Comparisons, and Communities. At the center of the standards are the three modes of Communication: Interpersonal, Interpretive, and Presentational. Interpersonal Communication involves interactive verbal interactions, such as face-to-face or telephone conversations, as well as written interactions, such as e-mail exchanges. Interpretive Communication involves comprehending and interpreting audio, visual, audio-visual, and printed resources. Presentational Communication refers to conveying messages in oral and written presentations. Integrating the standard of Communication into the curriculum allows students to practice performing authentic communicative tasks such as listening to announcements and messages, reading stories and e-mails, engaging in conversations, writing reports, and making oral presentations.

The standard of Cultures enables learners to comprehend the relationship between cultural products, cultural practices, and cultural perspectives. For instance, the chopsticks are a Chinese cultural product. Holding the chopsticks at their tips, in the middle, or at the other ends represent cultural practices. And the different ways of holding the chopsticks, as viewed by some Chinese people, reflect certain Chinese cultural perspectives on the expectations and obligations of children after they grow up and leave home. It is believed that a child who is used to holding the tip of the chopsticks will one day travel far and away and seldom come home. A child used to holding the chopsticks close to the ends will not want to leave home and will stay for the comfort and resources it provides. Neither scenario is ideal from the parents'—or grandparents'—point of view. A child who holds the chopsticks in the middle represents the ideal scenario—namely, the child will leave home to become independent but will also come home often to visit.

The standard of Connections emphasizes the importance of using the target language learned to connect to—and learn about—content areas in other disciplines. For instance, learning the rules of counting numbers can be connected to counting and describing populations, which can in turn lead to the study and discussion of population problems in China.

The standard of Comparisons stipulates that, in order to deepen the understanding of the nature of language and culture, a learner must learn how to compare the language and culture studied with those of his or her own. For instance, comparing the English auxiliary verb *can* with the Chinese *neng* 能 'can' and *hui* 会 'know how to' will enable students to understand the notions of language transfer and language interference as well as the meaning differences and similarities between *neng* and *hui*.

Comparing the sequencing (cultural practice) of the Chinese surname and given name (cultural products) with that of American names may help students develop an understanding and appreciation of the importance each culture places on an individual versus the community (family) to which the individual belongs. In a Chinese name, the family name goes before the given name. In an American name, the sequencing is the opposite. When inquiring about a Chinese person's name, the focus of the inquiry—and its answer—is on the family name. In a similar scenario in the American culture, it is common practice that the interlocutors are requesting and providing the given name, respectively. It can be argued that these facts seem to suggest that, in the Chinese culture, individuals are viewed as being less important than the family they belong to, while the reverse may be true in the American culture. A discussion of such a difference in cultural practices can lead to further discussions on why individualism seems to take precedence over collectivism in the American culture, while it is just the opposite in the Chinese culture.²

This conclusion from such discussions may or may not lead to cultural stereotyping, which may be viewed as either positive or negative depending on whom one talks to. However, through all of this rigorous comparing and contrasting, students are enabled to think about, debate, and evaluate cultural perspectives critically and independently. Finally, the standard of Communities points out the importance and necessity of learning and using the language studied in and outside the classroom for the purpose of enriching one's personal experience and becoming life-long, resourceful, and independent language learners. This standard encourages cooperative learning and risk-taking for both students and teachers.

42.2.2 Vertical Articulation of Learning Goals

The first and foremost consideration in curriculum design principles is to set the end goals for learning. For instance, the College Board AP Chinese Course, which equals the fourth-semester Chinese course in college, spans the proficiency range of Novice to Intermediate High, according to the definitions of the ACTFL Proficiency Guidelines. Therefore, Intermediate High, which, through backward design, becomes the basis for

articulation of learning goals for the courses under the AP Chinese course. For instance, the following is an example of vertical articulation focusing on a number of sample learning goals using such an approach.

AP Chinese learning goals: Intermediate High

The student

- begins to communicate in paragraph-level language by describing, narrating, elaborating, and explaining in familiar and some unfamiliar situations,
- handles a variety of transactional tasks with some complications,
- comprehends and expresses ideas using a variety of vocabulary and culturally appropriate expressions,
- writes exclusively in characters in a variety of media using appropriate formats and conventions.
- begins to handle authentic materials in all modalities.

Chinese III learning goals: Intermediate Mid → Intermediate High

The student

- begins to do simple and limited describing and narrating tasks while solidifying and enhancing sentence-level communication,
- communicates in mostly familiar and informal settings,
- listens to and reads authentic materials,
- writes longer narratives in characters,
- compares and comprehends the relation between familiar cultural products, practices, and perspectives.

Chinese II learning goals: Intermediate Low → Intermediate Mid

The student

- solidifies sentence-level communicative skills,
- communicates primarily on predictable and familiar topics related to daily activities,
- continues to study a variety of common authentic materials and makes cross-cultural comparisons.
- begins to write simple notes and journals in Chinese characters,
- compares a variety of language constructions, cultural practices and perspectives,
- continues to use cognitive skills to analyze and learn language on their own,
- continues to develop communication and language learning strategies.

Chinese I learning goals: Novice → Intermediate Low

The student

- starts communicating by using formulaic and rote utterances, words, and phrases in most common and informal settings,
- proceeds to sentence-level communication dealing with most common aspects of daily life in a school setting,

- begins to create sentence-level language by asking and answering simple questions in everyday life scenarios,
- focuses mainly on speaking and begins to read/write short sentences in characters.

42.2.3 A Thematic Approach

The new AP world language courses are organized around six major themes: Global Challenges, Science and Technology, Contemporary Life, Personal and Public Identities, Families and Communities, and Beauty and Aesthetics. Each major theme covers several subthemes which can be expanded when designing a curriculum.

- Global Challenges: Economic Growth, Environmental Issues, Geography, Politics, Population, Thought, and Religion
- Science and Technology: Health and Medicine, Impact on Tradition, Inventions, Media and Mass Communication, Nature, Science, and Ethics
- Contemporary Life: Education and Career, Holidays and Celebrations, Pop Culture, School Life, Travel and Tourism, Work and Leisure
- Personal and Public Identities: Alienation and Assimilation, Ethnicity, Gender Issues, Multiculturalism, Nationalism, Tolerance
- Families and Communities: Citizenship, Customs and Values, Family Structure, Relationships, Urban and Rural Development, Volunteerism
- Beauty and Aesthetics: Architecture, Fashion and Design, Film and Television, Language and Literature, Tradition and World Heritage, Visual and Performing Arts

The following is a sample learning activity designed for the theme of Contemporary Life.³ The model of this activity is adapted from the design template by Wiggins and McTighe (2005).

Theme: Contemporary Life

Recommended contexts: pop culture—leisure activities

Enduring Understanding:

- The students will understand that pop culture embodies cultural products and practices underpinned by cultural perspectives reflecting the cultural bearers' philosophies and value systems.

Essential Questions:

- How do societies and individuals define quality of life?
- How is contemporary life influenced by cultural products, practices, and perspectives?
- What are the challenges of contemporary life?

Instructional Objectives: The students

- review, individually and collaboratively, authentic materials relevant to the chosen theme in various contexts using interpretive and interpersonal communication,
- learn words, idiomatic expressions, cultural notions related to the theme and connect to other disciplines,
- compare interesting aspects of target culture and their own culture,
- prepare and present group reports on the target culture practices—and their significance—related to the theme.

Instructional Activities:

- Students work in pairs or triads to review a variety of web sites, pamphlets, advertisements, etc. containing information and about leisure activities in Taipei—e.g., karaoke, attending concerts, shopping online, and hanging out at night markets,
- explain to one another how contemporary Chinese culture is reflected in each leisure activity,
- determine which activities they find culturally most interesting.

Formative Assessment:

- Students complete a graphic organizer with information gathered from the materials they have reviewed, such as create a guide for online shopping, popular types of movies shown, a night market scene, and so on.

Summative Assessment:

- Each group gives a report on the cultural practices studied and their significance.
- Students use the information to discuss the differences on how leisure time is spent in the two cultures in terms of different (or similar) views of quality of life in the native and target cultures.

42.2.4 Performance-Based Instruction and Evidenced-Based Assessment

The curriculum pathways designed to enable students to achieve the stated learning goals must also include clearly articulated evidence-based criteria to show a student's progress as it ascends the performance-based proficiency scale. For instance, according to the ACTFL Speaking Proficiency Guidelines, an Intermediate level speaker can create with the language using discrete sentences and initiate, maintain, and bring to a close a simple conversation by asking and responding to simple questions. Evidence of student performance at this level may include a student using several sentences to do the following tasks:

- Describe self and family members and what they do.
- Ask and answer questions on where one lives.
- Express opinions on school related issues, such as homework, cafeteria food.
- Give simple descriptions of hobbies, fun activities on and off campus.
- Discuss and describe Chinese and Western food and different eating customs.
- Discuss how to use iPhone, iPod, and iPad.

42.2.5 Contextualized Instruction of Grammar

When practicing grammar, students will perform meaningful activities, anchored in communicative contexts to familiarize themselves. Grammatical constructions practiced in previous lessons will be recycled in subsequent lessons. In a learner-centered class, students will work on structured input activities to examine language data try to figure out the rules—and internalize them—on their own before performing an output activity (Lee and Van Patten 2003). This approach reverses the traditional method of providing grammatical information to the students and asking them to do output activities of often noncontextualized pattern drills. These form-focused pattern drills have not, as has been pointed out by many second-language acquisition researchers (e.g., Wong and Van Patten 2003), produced successful second-language communicators.

The following is a sample contextualized grammar exercise that includes both input as well as an output activity.

Phase I: Identify the communicative functions, the context, and the content areas of the grammar points being studied.

- Grammar points: Question Particles *ma* 吗, *ne* 呢, *ba* 吧
- Communicative Functions: Making inquiries by asking and answering questions, confirming information
- Context: Daily routine
- Content area: School work

Phase II: Input Activities (IA). The following IAs provide the learners with an opportunity to engage actively in analyzing the contextualized questions in the given conversations in order to figure out the rules governing the use of the three question particles. The learners must first develop an understanding of the functions of the question particles before they can actually use them correctly in communication, and they are more likely to retain the information they have discovered on their own rather than being told by their instructor. These activities are learner-centered and require the students to use their meta-cognitive skills to analyze, compare, and contrast, hypothesize, synthesize, draw conclusions, self-assess, self-adjust, and self-learn. The instructor walks among the groups to listen to their comments and make suggestions to help the students reach the correct conclusions.

1A 1: Unlike English, the structure of some Chinese question sentences is very similar to that of a nonquestion sentence. To create a question, a “question particle” (QP) is placed at the end of nonquestion sentence. Examine the following three dialogues between Speakers A and B. Use the English translations to determine what message each question particle is used to convey.

Dialogue 1

- A: Nǐ hǎo *ma*?
you good QP
‘How are you?’
- B: Wǒ hěn hǎo. Xièxie.
I very good thanks
‘I’m fine. Thanks.’

Dialogue 2

- A: Nǐ hǎo *ma*?
‘How are you?’
- B: Wǒ hěn hǎo. Nǐ *ne*?
QP
‘I’m fine. And you?’
- A: Hěn hǎo. Nǐ máng *ma*?
busy
‘Fine. You’ve been busy?’
- B: Hěn máng. Nǐ *ne*?
‘Quite busy. And you?’

Dialogue 3

- A: Nǐ shì Wáng Xiānsheng *ma*?
you are Wang Mr.
‘Are you Mr. Wang?’
- B: Shì. Nǐn shì Lǐ Xiānsheng *ba*?
QP
‘Yes. You must be Mr. Li. Right?’

1A 2: Draw a line to connect each of the particles on the left with its communicative function listed on the right.

- ma* The speaker already has an answer in mind and is merely seeking an affirmation from the hearer.
- ne* The speaker is asking the same question already asked of him or her by the hearer without repeating the same question.
- ba* The speaker is simply raising a yes/no question. He does not know if the answer is going to be yes or no.

Phase III: Output Activities (OA). The following OAs function as a formative assessment of the students’ ability to use the rules they have generalized from analyzing the

previous dialogues and use them accurately in interpersonal communication. In practicing interpersonal communication (spoken and written), the students provide evidence of achievement-based knowledge on their performance.

- OA 1: Using the question particles *ma*, *ne*, and *ba*, have a conversation with your partner to find out from each other who you are, how you are, what you are, and where you are from.
- OA 2: Imagine you have to communicate in writing with your partner who has lost his or her voice because of a severe cold. Do the same activity in OA 1 by writing down and exchanging with each other your questions and answers on a piece of paper.

42.2.6 Learner Variability and Differentiated Instruction

Having students with mixed levels of language proficiency in the same class is a reality for many teachers. The traditional teaching approaches are unitary rather than differentiated. Learner variability in terms of diverse needs, motivations, home languages, second-language learning experiences, learning styles, learning disabilities, and so on necessitates Differentiated Instruction (Boyles et al. 2011). For instance, heritage learners, whose home language is Chinese, often demonstrate stronger listening comprehension and speaking skills. They need more training in reading and writing to improve and maintain their language and culture.

Nonheritage learners typically have received more training on grammar, reading, and writing in the classroom setting but often lack the ability to speak fluently. They need more training in interpersonal and presentational spoken communication. Such challenges exist in Chinese classes at all levels in many programs across the United States.

41.2.6.1 Identify Mixed Abilities

To address these challenges, strategies need to be devised to identify the mixed levels in a class through assessment. This assessment can be based on the learning outcomes articulated for the AP world language curriculum framework. This framework was first launched for AP German Language and Culture in 2011.⁴

Using a variety of assessment procedures such as interviewing, having the students filling out a background survey, or giving quizzes on language and culture, the instructor can test the students’ communicative skills and cultural understanding with the following questions in mind.

- Interpersonal Communication: Can the student
- engage in an oral and written exchange of information, opinions, and ideas in a variety of informal situations?
 - elicit information and clarify meaning by using a variety of strategies—paraphrasing, circumlocution, recast?

- understand and use a variety of vocabulary and culturally appropriate expressions on a variety of familiar topics?
- demonstrate an understanding of some features of the Chinese culture?

Interpretive Communication: Can the student

- comprehend and summarize information from a variety of authentic audio, visual, audiovisual, written, and print resources?
- understand the purpose of a message and point of view of its interlocutor and author?
- demonstrate critical reading of written and print resources?
- demonstrate critical viewing or listening of audio, visual, and audiovisual resources?

Presentational Communication: Can the student

- plan, produce, and present a variety of spoken and written presentations (e.g., original story, speech, performance)?
- retell or summarize information in narrative form, demonstrating a consideration of audience?
- create and give persuasive speeches and write persuasive essays?
- expound on familiar topics and those requiring research to produce oral reports and expository writings?

As a result of the pretest, three groups with different levels of skills can be identified.

Group 1 learners:

- They have started to communicate using very simple vocabulary, formulaic expressions, and basic grammatical constructions;
- They have had very limited exposure to authentic language and cultural materials;
- They have very limited understanding of Chinese culture.

Group 2 learners:

- They can communicate using sentences in speech and in writing;
- They have worked with some authentic materials such as signs, menus, oral and written announcement;
- They have some understanding of Chinese culture.

Group 3 learners (heritage learners):

- They can speak fluently about everyday life topics, including using some idiomatic expressions;
- They have personal experience and familiarity with many Chinese cultural products and practices;
- They read and write using predominantly simple vocabulary and formulaic expressions.

42.2.6.2 Differentiation of Content, Process, Product

Tomlinson (2004) pointed out that differentiated instruction is student-centered and provides many approaches to content (what the students learn), process (how the students learn the content), and product (what the students produce to demonstrate how well they understand the content).

Differentiating the single theme-related content material allows diverse learners to learn in the same classroom. Differentiating the process sometimes involves changing the core activities for practicing different modes of communication. For instance, a conversation between two Group 2 speakers doing simple self-introductions can be altered to a task of writing a short narrative listing information about each speaker by Group 3 learners, thus allowing both groups to focus on their areas of needs.

Differentiation of the process and product can be achieved by increasing the level of breadth and depth of a core activity. For instance, to demonstrate understanding of the content material on the topic of family, Group 1 learners could study the theme-related vocabulary, draw a family tree, and tell the class who the family members are. Group 2 learners can learn the kinship terms, draw a family tree including extended family members, and discuss where they live and what they do. Group 3 learners, who can speak fluently about family members, can write a short essay introducing the immediate and extended family members. They could also do a research project to discover the history of several Chinese family names and share their findings in a spoken or written presentation.

42.2.6.3 A Sample Lesson Plan

The following is a sample lesson plan illustrating differentiated instruction for Group 2 and Group 3 learners.

| | Group 1 | Group 2 |
|-------------------------|---|--|
| Enduring Understandings | 1. Pop culture embodies cultural products and practices underpinned by cultural perspectives reflecting the cultural bearers' philosophies and value systems. 2. Learning a language connects people to the world. | |
| Theme | Contemporary Life: Planning a trip to a city in China and in Taiwan | Contemporary Life: Comparing life and Cultures in the Chinese-Speaking World |
| Essential Questions | Why is life similar and yet different for a person my age in other places and cultures? | How do cultural products, practices, and perspectives influence contemporary life? |

| Process | 1. Examine authentic materials (e.g., websites, pamphlets) containing information about traveling in Shanghai and Taipei. | 2. Work in small groups to determine and discuss sites they would like to visit and places they would like to stay during their trip and state their reasons. |
|-------------------------------------|---|--|
| Product: Formative Assessment | <ol style="list-style-type: none"> 1. Complete a graphic organizer with information gathered from the materials they have reviewed. 2. Complete a travel journal that includes a description of their travel (e.g., an itinerary and cultural experiences). 3. Give a short oral or written report on where they decide to visit and stay in Shanghai and in Taipei. | <ol style="list-style-type: none"> 1. Select an aspect of everyday life (e.g., school life, extracurricular activities, leisure activities). 2. Work in small groups to find authentic resources (e.g., online magazines, blogs), gather information on that aspect of contemporary life for a teenager in Shanghai and Taipei, and compare the similarities and differences between the cultural practices in China, Taiwan, and their own. |

NOTES

1. Descriptions of the five content standards are based on *Standards for Foreign Language Learning in the 21st Century* (1999).
2. For a detailed discussion of these linguistic and cultural comparisons, see Chi (2009).
3. Information in this section is derived from a presentation on Designing Instruction for AP Chinese Language and Culture at the 2009 AP Annual Conference in San Antonio, Texas, by T. Richard Chi and Yulan Jin.
4. At the time of this writing, the date for launching the curriculum framework for AP Chinese Language and Culture has not yet been determined. However, the

framework is generic and will be implemented for all AP world languages courses and exams.

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CHAPTER 43

CHINESE AS A HERITAGE
LANGUAGE

AGNES WEIYUN HE

43.1 CHINESE AS A HERITAGE
LANGUAGE: A DEFINITION

It is widely acknowledged that Chinese is the most spoken language in the world, by measure of the size of its native speaking population. It is less recognized, however, that Chinese is also a most common “heritage language” (HL) used by speakers who have a cultural and ethnic connection to it in the context of immigration and migration worldwide. In the United States, for example, Chinese is now the third most commonly used language (next to English and Spanish), with about 2.5 million speakers (US Census Bureau 2010). As early as the 19th century, Cantonese classes were offered to children of early immigrants residing in Chinatowns in a number of large US cities such as San Francisco and New York (Chang 2003). Today a rapidly increasing number of students of Chinese descent are taking Chinese within the US educational system from kindergarten to colleges and universities, in K–8 Chinese/English bilingual education as well as K–16 Chinese flagship programs, which aim to create superior level Chinese proficiency professionals in business, the sciences, law, and other fields. Needless to say, there is also the little documented, informal, everyday learning of Chinese at home. Globally, data from Hanban (the International Chinese Language Council, China, <http://english.hanban.org/>) show that more than several thousand higher education institutions in over 100 countries worldwide have established programs to teach Chinese, putting the total number of students learning Chinese outside China at 40 million, including learners with a Chinese background.

The term *heritage language* generally refers to an immigrant, indigenous, or ancestral language that a speaker has a personal relevance and desire to (re)connect with (Valdés 2001, 2005; Wiley 2001; Van Deusen-Scholl 2003). In the United States, Canada, and

the United Kingdom, the term *heritage language* has often been used synonymously with *community language*, *home language*, *native language*, and *mother tongue* to refer to a language other than English used by immigrants and their children. Accordingly, a heritage speaker is someone who is raised in a home where a nonmainstream language is spoken and who is to some degree bilingual in the home language and in the mainstream language (Valdés 2001:38) but whose home language does not typically reach native-like attainment in adulthood (Benmamoun et al. 2010). HL speakers have most likely been exposed to the HL since birth and may have used the HL during the initial years of their life and on and off subsequently but have never developed the full range of phonological, morphological, syntactic, pragmatic, and discourse patterns that enable them to use the HL in its scope and sophistication characteristic of and comparable to the native speaker.

Speakers of Chinese as a heritage language (CHL) are thus those who have an ethnolinguistic affiliation to the Chinese cultural heritage but who may have a broad range of proficiency in oral or literacy skills from mere receptive listening abilities in Chinese to balanced competence in both English and Chinese. Typically, they are either born in the United States or immigrated to the United States at a young age (often before puberty). Chinese is used in the household, but these speakers typically either use English exclusively or code-switch frequently between English and Chinese. Their ability in Chinese tends to deteriorate as their socialization into the mainstream culture and society unfolds (Wong Fillmore 1991, 2000; Li 1994; McKay and Wong 1996; McGinnis 2005; He and Xiao 2008). As a result of their incomplete exposure to and acquisition of Chinese, the often rather rapid attrition of Chinese along with the influx of English, and the transfer or interference from English, these speakers exhibit linguistic and sociocultural traits that distinguish them from speakers of Chinese as a foreign language as well as from speakers of Chinese as a native language.

43.2 LINGUISTIC-STRUCTURAL
CHARACTERISTICS

It is only recently that linguists have begun to pay attention to HLs as a form of natural language (Montrul 2008, 2009; Polinsky 2006, 2008a, 2008b). It has been observed that HL speakers may not have the “native” pronunciation or the size of vocabulary that is adequate for a broad range of purposes. They may not speak in grammatical sentences, sometimes omit or misplace morphemes, may not recognize ambiguity and/or multiple interpretations and pragmatic implications of words and sentences, and may not be attuned to their sociolinguistic environment (social class, social context, gender, register, etc.). In other words, these speakers are easily identified as being different from native speakers by their ethnolinguistic communities.

We are just beginning to grasp the linguistic system that CHL speakers command—their phonology (do they have Mandarin pronunciation or other dialectal variation and accommodation, English-accented pronunciation, etc.), morphology (do they already understand character formations, the notion of Chinese words, phrases, phrase structures), syntax (is grammar conscious to CHL speakers), and discourse pragmatics (to what extent are CHL speakers aware of different speech styles, genres, speech acts, speech events, etc. and their social distributions and functions). The following is a brief summary of what we know about the linguistic characteristics of CHL speakers at this point.

43.2.1 Morphology, Lexicon, and Literacy

It is claimed that morphology, particularly inflectional morphology, is an area in which HL speakers in general often have the most trouble. It is further suggested that HL speakers appear to struggle more with nominal morphology than verbal morphology; agreement, aspect, and mood are much weaker areas in heritage speakers than is tense (Benmamoun et al. 2010).

In Chinese, the distinction between roots and affixes is often blurred, and the concept of the Chinese “word” remains rather illusive. Chinese morphemes mostly correspond to characters (single syllables) and are graphically encoded by radicals. Lexical and literacy development thus relies crucially on the knowledge of radicals as they provide the visual and functional bases for character segmentation and meaning identification. Consequently, weaknesses in morphological derivation or inflection documented in other HLs manifest themselves in the challenges CHL speakers face in the command of characters. Due to infrequent and incomplete exposure to print input, CHL speakers typically have difficulties with recognition and retention of characters, especially complex characters with copious strokes (Koda et al. 2008a). School-age CHL speakers often lack metalinguistic knowledge of the morphological structure in a Chinese word and are unable to dissect, identify, and manipulate morphemes in printed words. Adult CHL speakers often lack the ability to access or retrieve from earlier memory either phonological or semantic information of radicals, which makes it difficult for them to infer the meanings of unfamiliar characters or to access stored character information.

Such incomplete or underdeveloped morpheme-character awareness accounts for, to a large extent, the widely observed phenomenon that CHL speakers tend to have rather low literacy skills. They may use Chinese at home, receive primary literacy instruction in English at school, and pursue ancillary literacy in Chinese in a weekend school. As such, their primary literacy tends to build on underdeveloped oral proficiency, and secondary literacy reflects heavily restricted print input and literacy experience. While some young CHL speakers may be able to offset the limited linguistic support with additional meta-linguistic and cognitive resources and succeed in HL literacy (Koda et al. 2008b), adult CHL speakers find it extremely challenging to develop or maintain their level of literacy (Xiao 2008).

43.2.2 Grammaticality

Compared with native speakers, CHL speakers’ syntax appears simple and sometimes aberrant. Grounded in corpus linguistics, Ming and Tao (2008) examined 1,000 samples of written essays and narratives produced by adult CHL speakers, with a total of about 200,000 characters. They devised a coding system with ten major categories and thirty-six subcategories for CHL errors, including but not limited to the following:

Underuse or overuse of aspect markers:

- (1) a. 我知道如果我去买这本书,

wo zhidao ruguo wo qu mai zhe ben shu

I know if I go buy this CL book

‘I know if I go ahead and buy this book;’

- b. *你会学了很多东西,

ni hui xue-le hen duo dongxi

you can learn-ASP very many thing

‘you can have learned many things;’

- c. *也会成高兴了一点

ye hui cheng gaoxing-le yidian

also can become happy-ASP somewhat

‘[you] can also have become somewhat happy.’

Failure to use verb complement:

- (2) 我去晚了, *不可以买

Wo qu wan le, bu keyi mai

I go late-le NEG can buy

‘As I went late, I couldn’t buy.’

Collocations:

- (3) *培养 (保养) 身体

peiyang (baoyang) shenti

‘take care of one’s health’

Classifier errors:

- (4) *两个书

liang CL(ge) shu

two books

Word order errors:

(5) *Deer 把那个小孩跑跑了用角。

deer ba na ge xiaohai gan-pao-le yongjiao

Deer BA that CL child chase-COMP-ASP use horn

'Deer chased that child away with its horns.'

Polinsky et al. (2010) found that in cases in which native Chinese speakers use BA construction, for example, CHL speakers exhibit poor control of the construction and instead resort to multiple short utterances with the canonical SVO structure. Where native speakers use verb compounds, CHL speakers use single verbs. In terms of word order, CHL speakers also tend to place attributes such as relative clauses after, rather than before, the noun.

Variation in grammatical ability is found not only between native speakers and CHL speakers but also within CHL speakers. Jia and Bayley (2008) analyzed over 500 tokens of grammatical or ungrammatical use of *-le* and found that *-le* is more likely to be used in sentence final than in postverbal position and more likely to be used in obligatory than in optional contexts, so that China-born HL speakers favor more grammatical use than US-born HL learners and CHL speakers who regularly interact in Mandarin at home are more likely to use *-le* appropriately than those who frequently or exclusively interact in English at home.

43.2.3 Phonology

Relative to other areas of language competence, HL speakers have great strength in phonology. There is, of course, great variability among them, some sounding no different from native speakers while others speaking with a heavy "heritage accent" (Au et al. 2002; Godson 2004) due to infrequent or lack of use or exposure. In a study that contrasts the production of Mandarin and English by CHL speakers, native speakers, and late learners of Mandarin, Chang et al. (2009) find that heritage speakers, in addition to most late learners, do not have much trouble with the Mandarin post-alveolar contrast (Mandarin /s/ vs. /c/, Mandarin /c/ vs. English /ʃ/, Mandarin /s/ vs. English /ʃ/ or Mandarin /s/ vs. English /s/) Second, while native speakers and late learners of Mandarin tend to merge similar Mandarin and English sounds, heritage speakers tend to keep them apart. This study suggests that when similar categories are acquired early, they interact with each other in a shared phonological system and are dissimilated or distinguished from each other.

In addition to interference from English, CHL speakers also have dialectal sources of influence on their speech production. *Chinese* is an umbrella term that subsumes numerous dialects that are grouped under Wu, Xiang, Gan, Min, Cantonese, Hakka, and Mandarin. Many of the dialects are mutually incomprehensible. *Mandarin* is a

term referring to the majority dialect family of China. Its pronunciation is associated with the speech of Beijing and its surrounding countryside, regions that for centuries have enjoyed political and cultural significance. Also known as *Putonghua* 普通话 in mainland China, *Guoyu* 国语 in Taiwan, and *Huayu* 华语 in Singapore, Mandarin serves as the standard dialect and is thus the most commonly taught variety in Chinese language classrooms in the United States and elsewhere. Hence a "heritage" speaker of Chinese may in fact have multiple heritages in Mandarin as well as other dialects (Wiley et al. 2008) that, coupled with English phonology, may lead to complex stress and intonational patterns, syllable structures, tones, and pitch contours in Mandarin CHL speech.

43.2.4 Discourse

One of the hallmarks of CHL discourse is the interweaving of Chinese with English, more commonly known as code-switching (Li and Wu 2008; Zhu 2008; Li 2011). CHL speakers switch back and forth between the two languages both intersegmentally and intrasententially. Given their native or native-like, intimate exposure to both English and Chinese in the oral form, their code-switching practices are typically spontaneous, effortless, creative, and colorful. CHL speakers not only laminate English words with Chinese classifiers, intensifiers, verb complements, infixes, and tones; they also embed Chinese in English syllable structure, tense, and aspect markers and word order. They mix and mingle English and Chinese at junctures of utterances where the two grammars are not compatible, move bound morphemes freely across the two languages, and produce a large number of instances of lower-level constituent code-switching as in the following cases (square brackets indicate onset of overlap; underline indicates stress):

(6)

S1: Wow, 二十分钟怎么够? 先-先把它先把它-先()抄: 下来

san fenzhong zenme gou? Xian xian ba ta xian ba ta xian chao xialai
three minute Q-how enough first first BA it first BA it first copy COMP
Wow, how can three minutes be enough? First first first copy it down.

⇒ S2: 我在抄-ING, o[kay?]

wo zai chao
I ASP copy
'I am copying, okay?'

S3: 先 copy 啦
xian PRT
'First copy, ok'

Here, three students in an advanced CHL class are engaged in group work. They are asked to read a passage and then give an oral summary of the reading to the class. They have three minutes left. The first student suggests, in Chinese, that they copy some item from the reading first. It takes considerable work for the first student to complete this initial turn, which includes false starts, cut-offs, and re-dos before landing on an emphatic verb *chao* 'copy' and its complement. The second student counters that he is already copying that item, putting both the Chinese aspect marker *zai* and the English aspect morpheme *-ing* around the Chinese verb *chao* 'copy':

Defying the grammatical constraints described by Poplack (1980), Myers-Scotton (1993), and others, CHL speakers seem to break all conceivable linguistic boundaries, as is the case in (7).

(7)

P: 你们不是要八个人吗?

nimen bu shi yao ba ge ren ma?

you PL COP NEG need eight CL person Q

'Don't you need eight people?'

⇒ C: Yeah, we're looking for the 八-th person.

Yeah, we're looking for the ba-th person

eight

'Yeah, we're looking for the 8th person.'

In this case, a parent in a CHL household asks in Chinese her teenage son about the number of members needed for the math competition team that the son is on. The teenager's reply is completely in English with the exception of the ordinal number "eighth" which he dissects into two parts "eight" and "-th" and substitute "eight" with the Chinese equivalent of *ba*. The end result is a noun phrase that consists of the English definite article, a Chinese numeral, an English ordinal morpheme, and an English head noun (the *ba*-th person). The production of this mixed utterance also shows a fluid, single, coherent pitch contour.

The fact that CHL speakers migrate between and mingle the two language systems freely and frequently at multiple and nested levels of phonemes, morphemes, syllable structures, tones, noun/verb phrases as well as sentence structures suggests that they have simultaneous access to both English and Chinese, regardless of the level of proficiency (He 2011b).

Research also shows that interactions involving CHL speakers, especially young CHL speakers in institutional settings, tend to exhibit distinct turn-taking patterns (He 2001), participation structures (He 2003), pronominal references (He 2009), modal choices (He 2011c), and pragmatic markers (Chen and He 2001), which reflect and reconstruct the multilevel and multidimensional social contact of CHL speakers, their various social and speech roles, their immigrant family background, and expectations

as well as their ethnic and linguistic identities. It is to these and other sociocultural traits that we turn next.

43.3 SOCIOCULTURAL TRAITS

The very notion of a HL is a sociocultural one insofar as it is defined in terms of a group of people who speak it. HLs also have a sociocultural function, both as a means of communication and as a way of identifying and transforming sociocultural groups. We now know that constant and sustained exposure to the HL in the home during the initial years of life is not adequate, in most cases, for HL speakers to develop native-like competence. Even continued exposure after puberty does not guarantee successful HL maintenance. Certain aspects of the language, most notably lexicon, morphological awareness, and complex syntax, are highly vulnerable to attrition. In addition to cognitive reasons, a whole host of sociocultural factors such as motivation, attitude, identity, and social network play an important part in shaping HL (He 2010).

It is not difficult to imagine that HL is intricately woven with HL speaker identity formation or transformation and attitude toward the ethnic group. Generally, HL is better developed and maintained when the HL speaker has positive attitudes toward the language; feels positively about his or her ethnic group; and has a greater understanding and knowledge of the group's cultural values, ethics, and manners (Li 1994; Tse 1998, 2001). Furthermore, HL development is a socialization process with multiple agencies, directions, and goals, which is contingent upon the degree to which the speaker is able to construct continuity and coherence of identity in multiple communicative and social worlds (He 2006). CHL acquisition and maintenance processes can be viewed as identity processes whereby the CHL speaker acquires and adjusts additional and alternative voices as resources for the positioning of self and of others (Dai and Zhang 2008). Age of immigration, social economic status, as well as self-reported Chinese cultural identity are among the main factors that account for CHL maintenance or attrition; on the other hand, community-based weekend or evening Chinese language schools do not seem to have significant long-term effect on CHL attainment (Wang 1996; Weger-Guntharp 2006; Xiao 2006).

Additionally, CHL speaker identity issues may take on greater complexity in the case of Chinese dialect speakers who now speak or study Mandarin—a "heritage" language that sounds different from their "mother tongue" and perhaps is not spoken in their ethnic communities. Speaking Mandarin for them is not simply about inheriting the past but, more significantly, about accumulating linguistic and cultural capital in the global context for their future (Wong and Xiao 2010). As such, the notion of "world citizenry" (He and Xiao 2008) may be a particularly useful identity construct in the imagination and alignment of CHL speakers.

It is important to keep in mind that these sociocultural variables are themselves dynamic and constantly evolving, as the HL speakers' and their families' immigration

experiences unfold. As their cultural allegiances and linguistic investments evolve over time—as they manage, maintain, and create hybrid identities and synergetic cultures—CHL speakers, like other HL speakers, will find themselves along a bilingual, bicultural, biliteracy continuum (Hornberger 2004) with varying linguistic and sociocultural outcomes across the lifespan (He 2011a).

43.4 FUTURE DIRECTIONS

“Heritage linguistics” is a fledgling but fast-growing area. Its significance to both theoretical linguistics and applied linguistics is just beginning to be recognized. In the area of CHL, we can expect to see in-depth investigations of the interactions between all the languages and dialects known by the CHL speakers, in areas of grammar, morphology and lexis, phonology, discourse pragmatics, literacy, and identities. We hope to gain a better understanding of what it means to become bilingual and multilingual speakers and how to use CHL as a resource to create possibilities for diasporic Chinese individuals, communities, and societies that are otherwise unimaginable. To this end, we will need to employ a wide range of analytical perspectives and tools, including, among others, case study research to track specific trajectories of CHL development or attrition across different individuals and different generations; cognitive sciences to understand how the brain works as it processes or reactivates Chinese linguistic features acquired early in life by CHL speakers; corpus linguistics to gather empirical data on the uses, collocations, and frequencies of linguistic features in CHL speech and writing; conversation analysis and discourse analysis to unravel the connection between language competence and multilingual and multimodal communication; and linguistic anthropology to delineate the context of culture in which CHL is embedded.

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CHAPTER 44

LINGUA FRANCAS IN
GREATER CHINA

DAVID C. S. LI

44.1 INTRODUCTION

GREATER China, a term that refers loosely to four more or less distinct polities—mainland China, Taiwan, Hong Kong, and Macao—covers a land space of about 9.6 million square kilometers and is home to over 1.35 billion inhabitants. More than 90 percent of the people identify themselves as members of the biggest ethnic group, the Han (汉族, *Hanzu*). Other non-Han ethnic groups (e.g., Tibetans and Uyghurs) are found mainly in the northwestern and southwestern parts of China. This chapter provides a brief account of the national and regional Chinese lingua francas spoken by its Han speakers.

The term *lingua franca* has been defined and used in different ways. In a narrow sense, a lingua franca (or working language, bridge language, vehicular language) refers to a language used by speakers of “the neighboring heterolingual communities [who] do not speak each other’s languages but [who] use instead a third language as a means of mutual communication” (Chirikba 2008:31). Thus when English is used in dyadic communication between Mexicans and Koreans, or between Japanese and Chinese, English is used as a lingua franca. In other words, neither side is a native speaker of the lingua franca. For our purpose, however, the term is used in a broader sense to include situations in which native speakers of the lingua franca may be involved.

Like other major languages in the world, the Chinese language consists of many varieties and subvarieties. These are generally referred to in Chinese as *fangyan* 方言 ‘dialects.’ Research shows that, historically, regional dialects in China have always coexisted with the national lingua franca *minzu gongtongyu* 民族共同语, literally ‘nationally-common-language,’ which tended to be the language(s) spoken by the politically more powerful and socioeconomically well-educated elite group(s). Since the Yuan Dynasty (1271–1368 CE), Beijing gradually became the political, economic, and cultural center of the Middle Kingdom. Putonghua, the national language and

lingua franca since 1949, is largely modeled on the pronunciation of the Beijing dialect. Depending on the region, however, other local Chinese varieties may serve as regional lingua francas, either in addition to or in place of Putonghua.

Linguistically, the term *Chinese* is internally complex as it may refer, in speech, to one of seven major Chinese dialects, each with its own subdialects (Li 2006:153):

- Mandarin (北方方言, *Beifang fangyan*; spoken in northern, northwestern, and southwestern parts of China)
- Wu (吴语, *Wuyü*, spoken mainly in Shanghai and the provinces Jiangsu and Zhejiang)
- Min (闽语, *Minyu*, spoken mainly in Fujian)
- Yue (粤语, *Yueyu*, spoken mainly in Guangdong and Guangxi)
- Xiang (湘语, *Xiangyu*, spoken in Hunan)
- Gan (赣语, *Ganyu*, spoken in Jiangxi)
- Kejia [Hakka] (客家话, *Kejiatua*, mainly spoken in small enclaves in different provinces in southern China, notably Guangdong, Guangxi, Fujian, and Sichuan)

These are generally referred to as Sinitic languages, a branch of Sino-Tibetan (see, e.g., Chappell 2006). The dialect of Beijing is a subdialect of Northern Mandarin. As the six dialects are spoken in the regions south of the Yangtze River, they are collectively known as “southern dialects.” The Mandarin subgroups and the speakers of southern dialects account for about 70 and 30 percent of the Han population, respectively. An overview of the geographical regions where these dialects are spoken may be found in the *Language Atlas of China* (Wurm et al. 1987).

As a loose translation of *fangyan*, the term *dialect* as used in the Chinese context should be interpreted with caution. As many Western linguists have observed, given that speakers of different regional dialects tend to have great difficulties communicating with each other, Chinese “dialects” are in reality more like languages from the point of view of mutual intelligibility. For instance, the chance of successful communication between dialect speakers of Min (from Fujian or Taiwan) and Cantonese (from Guangdong or Guangxi) is slim, compared with that between speakers of Spanish and Portuguese, or Norwegian and Swedish, each speaking their national language (cf. Wang 1997). In the latter cases, success is assured by proximity in the respective linguistic subsystems from phonology (the system of pronunciation) to lexis (vocabulary) and grammar. It is therefore not surprising that Chinese dialects are regarded by Western linguists as more like languages.

If Chinese speakers of different dialects cannot communicate with one another, why aren’t they called languages (语言, *yuyan*)? There are two main reasons. The first reason is rooted in a culturally determined and ideologically perpetuated “linguistic cosmology” in that successive generations of Chinese are taught to believe that all Han Chinese have a common ethnolinguistic ancestry despite considerable diversity in their vernaculars. One telling example is the Chinese reference grammar *Zhongguohua de wenfa* (中国话的语法, *A Grammar of Spoken Chinese*, Chao 1968:12), where the author states that “what is true of that [Beijing] dialect, especially in matters of grammar, is usually true of all the northern dialects, and very often true of all the dialects.”

The second reason is related to the way Chinese is written, a logographic (i.e., non-alphabetic) writing system, more commonly known as *fangkuai* 方块字 'Chinese characters'. Unlike alphabetic languages such as English, German, and Russian, which are written or spelled based on the mapping of discrete speech sounds (e.g., consonants and vowels) onto different configurations of graphical units or letters that make up the alphabet, the Chinese writing system is nonalphabetic but logographic. For instance, a bisyllabic Chinese word such as 大學 is pronounced as *dàxué* by Mandarin speakers, and *daii²² ho*k*²²* by Cantonese speakers. As Wang (1997:61) observes, such a writing system "is uniquely well-suited to the spoken forms, satisfying the equation: 'character = morpheme = syllable.'" Apart from preserving the link with historical Chinese heritage and maintaining lingua-cultural continuity in writing, this orthographic principle or design of written Chinese allows its users to read or pronounce Chinese words in their respective dialects. One interesting consequence is that dialect speakers who fail to get their meanings across may resort to writing, often with a fair chance of success—subject to two caveats. First, in the People's Republic of China, Chinese characters have undergone considerable simplification (e.g., 國, 'country'), whereas traditional Chinese characters continue to be used in Taiwan and the two Special Administrative Regions (SARs), Hong Kong and Macao (e.g., 國, 'country'). Second, while dialectal elements in writing are not encouraged in mainland China, words specific to Southern Min and Cantonese are commonly used in Taiwan and the two SARs, respectively; especially in "soft" genres of print media, including on the Internet. Not surprisingly, this is a source of literacy problems for Chinese readers who are unfamiliar with Southern Min or Cantonese.

In terms of learning how to write, unlike learning words in an alphabetic language, the pronunciation of a Chinese word, which may consist of one or more morphosyllables or characters, must be learned along with its meaning(s) and written form. For Chinese as an additional language learners, therefore, the acquisition of written Chinese is generally more challenging and time-consuming compared with learning how to write an alphabetic language.

44.2 NATIONAL AND REGIONAL LINGUA

FRANCAS IN MAINLAND CHINA

44.2.1 Putonghua/Mandarin: The National Lingua Franca of Mainland China

In addition to being a symbol of national unity, a standardized national language is needed for effective governance, socioeconomic development, social advances through education, and the cultivation of shared cultural values. The national spoken languages of China and Taiwan are linguistically very similar, although they go by different names: *Putonghua* 普通话, literally 'common language' in mainland China, and *Guoyu*

國語, literally 'national language' in Taiwan.¹ In China, the phonological system of Putonghua is essentially based on the norms of pronunciation in Beijing, while its vocabulary and grammar are modeled on those of Northern Mandarin dialects and exemplary modern works in *baihua* 白話 'vernacular literary language' (Chen 1999:24). As such, Putonghua does not coincide with any regional dialect; rather, it is virtually a product of careful language planning. For speakers of other dialects, the learning of Putonghua is akin in many ways to the learning of a second language in the border regions of nation states in Europe (compare, e.g., the learning of standard German by native speakers of Luxembourgish, which for speakers of standard German is a German-based dialect).

Since the founding of the People's Republic, the vitality and use of regional dialects is assured by a national language policy that fosters "dialect bilingualism" or "bilingualism" (Erbaugh 1995). Accordingly, official and media events should be conducted in Putonghua, while informal interaction at the local or regional level may take place in the local people's preferred vernacular(s). The promotion of Putonghua is certainly a high priority, but this does not take place at the expense of regional dialects, which is officially recognized as a crucial and integral part of their speakers' shared lingua-cultural heritage rooted in their local identity in the same "hometown" (e.g., programs featuring opera sung in the regional dialects are routinely broadcast locally on the radio and TV). Consistent with the spirit of this benign national language policy, enforcement takes the form of carrots rather than sticks, for example, by enlisting cadres who publicly advocate the use of Putonghua at official functions.

The promotion of Putonghua has been one of three important policy goals since the 1950s,² when the number of speakers who could understand Putonghua in China was estimated to be less than 50%. Given considerable linguistic diversity within its borders, however, the promotion of Putonghua has been and remains a thorny task, one that has met with some resistance in the dialect areas despite significant progress in the decades since 1949. To facilitate the learning of Putonghua, a standard Romanization system called Pinyin was introduced. It has proved to be a very useful learning aid. In addition, local dialects are banned in the classroom, and classes from preprimary to tertiary levels are conducted in the medium of Putonghua. Slogans and reminders that teachers should speak in Putonghua are not uncommon in teachers' rooms and elsewhere on the walls within school premises. Specific Putonghua-level requirements are also set for certain professions on a scale of 1 to 3, with 1 being the highest level. Thus Level 1 Putonghua is required for media professionals such as journalists, newscasters, performers, and artists. To enter the teaching profession in the dialect areas, Level 2 is the threshold. In other sectors in the dialect areas, such as the civil service and service industries in general, a Putonghua-preferred policy is more or less strictly enforced.

Thanks to measures such as these, there is some indication that the percentage of people who are conversant in Putonghua nationwide has been steadily on the rise. By 1984, about 90 percent could understand Putonghua, but the percentage of people who could speak it remained rather low at only about 50%. Today, the percentage of speakers who can understand and speak Putonghua must be considerably higher, but there are no reliable recent statistics to my knowledge.

How successful the Putonghua promotion campaign is depends in part on the relative proximity of the speaker's home language to Putonghua linguistically. In general, for those in the Mandarin-speaking areas roughly in the north, northeast, and the northwest, the learning of Putonghua is relatively straightforward, for it means adjusting their pronunciation and lexico-grammatical choices more or less to meet the norms of the standard. Their learning is thus generally more successful than those in other dialect areas. Indeed, the learning of Putonghua is not at all straightforward for dialect speakers residing roughly south of the Yangtze River. To facilitate the learning of Putonghua by these dialect speakers, contrastive analysis between Putonghua and various dialects and subdialects has been carried out, yielding a body of research that has led to the publication of many informative references and learning aids for dialect speakers.

Another hurdle toward the effective learning of Putonghua is lexical variation, which is considerable within and across dialect groups, as shown in the number of lexical variants. For example, in the Mandarin-speaking areas, more than thirty lexical variants have been found for basic vocabulary such as *zhangfu* 丈夫 'husband' and *qizi* 妻子 'wife'; seventeen lexical variants for *cesuo* 厕所 'toilet', and twenty-two for *chufang* 厨房 'kitchen' (cited in Li 2006:156–158). This helps explain why, despite relative phonological proximity among the Mandarin subdialects, intelligibility problems between their speakers cannot be avoided. Cross-dialectal variation is even more marked. For instance, with regard to closed lexical sets of function words such as adverbials of time, measure words, demonstrative pronouns, and terms of address, several dozens of lexical variants have been identified in different dialects and subdialects. This is why communication across dialects is anything but smooth and a lingua franca is needed to minimize intelligibility problems.

Apart from acquisitional problems rooted in the relative linguistic distance with Putonghua, dialect speakers' emotional attachment to the local and regional dialects is another barrier. Even though Putonghua is the official medium of instruction from preprimary nurseries to tertiary education, and Putonghua is the preferred language in formal national or regional events, the regional dialects have mass followings and tend to rival the prestige of Putonghua in informal settings.

In terms of the effectiveness of the Putonghua promotion campaign, there is some indication that the amount of schooling—Putonghua medium by definition—is a fairly good predictor of a speaker's ability to understand and speak Putonghua. Dialect speakers who are illiterate are therefore unlikely to be fluent Putonghua speakers. Other relevant factors include whether there is a competing, prestigious local or regional dialect and whether the dialect area is linguistically heterogeneous. Thus, in Guangzhou, the provincial capital of Guangdong province, the promotion of Putonghua is less effective partly because of the presence of a prestigious dialect and regional lingua franca, Cantonese (compare Hong Kong and Macao; see later discussion). In contrast, where the local vernaculars are mutually unintelligible, such as the subdialects of Min in Fujian province, the promotion of Putonghua has been relatively more successful.

Recently, more linguists and sociolinguists in mainland China recognize that, instead of expecting everyone to attain Level 1 Putonghua, some of the "learner features" in the

learning process may be more appropriately seen as terminal learning goals in their own right rather than being labeled as "errors." Accordingly, there is growing recognition of local or regional varieties of Putonghua in China.

4.4.2.2 Regional Lingua Francas in Mainland China

In the dialect areas, Putonghua has to compete with one or more regional lingua francas. In general, the economically better off the dialect speakers are, the more prestigious their vernaculars. Cantonese, by virtue of the fact that it is also the dominant vernacular of more prosperous speakers in Hong Kong and to a lesser extent, Macao and the Pearl River Delta region, is by far the most prestigious southern dialect. Since the 1980s, mainland business people wanting to do business with their counterparts in Hong Kong are eager to learn some Cantonese. From the 1990s onward, Hong Kong-based Cantonese TV programs transmitted via satellite are increasingly accessible to mainland viewers in Guangdong province and beyond. Cantonese is also both the inspiration and the carrier of sundry cultural consumables such as Cantopop songs, karaoke video discs, and TV dramas. All this explains why many mainlanders are eager to learn it as an additional language or dialect. More recently, such a trend has been further enhanced by rapidly expanding cross-border visits of mainland Chinese tourists to Hong Kong, although this development has also motivated many Cantonese-dominant Hong-Kongers, notably employees in hospitality industries, to learn some Putonghua.

A few other regional lingua francas, especially those spoken by people living in regions along the South China coast, are popular for similar reasons. For over half a century, since the late 1900s, many Chinese migrants fled political instability and economic hardship in search of a better life in diasporas, notably in Southeast Asia and North America. Over time, the descendants of these early migrants have accrued wealth and, taking advantage of their mother country's open door policy since the 1980s, invested in businesses and/or initiated charity projects through making generous donations in their hometowns. The inability of these *huaqiao* 华侨 'overseas Chinese' to speak Putonghua matters little; what matters is their economic success, which makes them proud of the vernacular passed on to them by their forefathers and others from the same hometowns in the coastal regions. This is essentially why Yue, Wu, and Min—dialects spoken in regions along the South China coast—are relatively more prestigious compared with the other three dialects Gan, Kejia, and Xiang, which are spoken in landlocked provinces. One consequence is that speakers of less prestigious dialects and subdialects tend to find it useful to learn one or more prestigious dialects to facilitate communication with the locals. In sum, in the economically more prosperous coastal regions, one perennial reality that Putonghua speakers must contend with is that Putonghua has to compete with the local or regional lingua francas, especially in informal interaction with the locals.

44.3 GUOYU AND SOUTHERN MIN IN TAIWAN: NATIONAL AND REGIONAL LINGUA FRANCA

Ethnolinguistically, Taiwan is essentially a multilingual Chinese community. With a population estimated at over 23 million, the majority of Taiwanese are probably best characterized as bilingual speakers of Guoyu (Mandarin), the national language since 1949. Two other Han Chinese varieties are Southern Min (*Minnanhua*) and Hakka (*Kejia*), regional dialects that were brought to the island by early migrants from the south of Fujian and the north of Guangdong across the Taiwan Strait since the 17th century. Guoyu, on the other hand, was mandated by the Kuomintang (Nationalist) government under Chiang Kai Shek, who fled to Taiwan after losing the civil war. For nearly four decades until 1987 when the martial law was lifted, a draconian Guoyu-only policy was enforced. During this period, no other languages were tolerated; harsh punitive measures (e.g., in school) were imposed. One consequence is that those Taiwanese whose home language was one other than Guoyu—descendants of earlier settlers, so to speak—grew up to become Guoyu-dominant speakers, with or without developing native-like competence in their (grand)parents' home language. Interestingly, their embittered sentiments are reflected linguistically in a deep-seated "them versus us" divide: the term *waishengren* 外省人 'outsiders' (literally, 'people outside of the province') was coined in reference to the Guoyu-speaking settlers who arrived after the Second World War, and is still in common parlance today (and amplified, e.g., in high-stake election campaigns).³

In addition to Han Chinese, there is a tiny non-Chinese population of Polynesian origin. These indigenous peoples are collectively referred to as *yuanzhumin* 原住民族 'aborigines.' There used to be dozens of mutually unintelligible aboriginal languages. Today, few young Taiwanese of aboriginal descent are able to speak the language(s) of their forefathers, largely as a result of sociopolitically hostile language policies of successive governments in the past century.⁴ Sadly, therefore, aboriginal languages in Taiwan have either undergone language death following the demise of their last speakers or are undergoing radical language shift and classified as "endangered," for the number of fluent speakers is numerically not significant enough to warrant effective language revitalization or maintenance.

In terms of distribution of the speakers, broadly speaking, Guoyu prevails in the northern part of Taiwan; the south is dominated by Southern Min, while smaller enclaves of Hakka-speaking and aboriginal language communities are scattered in different parts of the island. This is why, in general, the further down south one travels, the more apparent it becomes that Southern Min is the preferred lingua franca of local inhabitants. In sum, being the national language, Guoyu is the most widely learned and spoken lingua franca across Taiwan, except in the south, where it competes with Southern Min, the regional lingua franca.

Linguistically, Putonghua in mainland China and Guoyu in Taiwan are cognate languages. Intelligibility problems in communication between their speakers are minimal. For over six decades since the 1950s, however, having undergone socio-cultural development more or less unique to successive generations of its speakers, Guoyu or "Taiwan Mandarin" has evolved its own regional linguistic characteristics. Systematic linguistic differences between (mainland) Putonghua and Guoyu are especially pronounced in vocabulary, in phonology to some extent, and less so in grammar.

44.4 CANTONESE AS A LINGUA FRANCA IN TWO SPECIAL ADMINISTRATIVE REGIONS: HONG KONG AND MACAO

Through an unprecedented sociopolitical arrangement, 'one country, two systems,' the former colonies Hong Kong and Macao returned to China and became SARs (HKSAR and MSAR) on July 1, 1997 and December 20, 1999, respectively. As far as language policy is concerned, whereas the language of the former colonial masters (English in Hong Kong, Portuguese in Macao) continues to be listed in the Basic Law as a co-official language after the handover, the term *Chinese* is tacitly understood as referring, in speech, to Cantonese rather than to Putonghua. Consequently, Cantonese continues to thrive in such important domains as government, education, law, and media in the two SARs. Putonghua is recognized as a national language, but its use remains restricted to ceremonial and symbolic functions.

With few exceptions, in school, from the preprimary to the tertiary level, written Chinese (traditional rather than simplified characters—unlike in the mainland) is taught and pronounced in Cantonese as before. Some sociolinguists believe this policy has important implications with regard to ensuring the continued vitality of Cantonese in the two SARs. The fact that Chinese literacy is developed essentially through Cantonese helps explain the spread of written Cantonese in informal settings. As is well known, dialect writing is not encouraged in mainland China. In the Chinese newspapers of the two SARs, however, it is not difficult to find Cantonese-specific words in such "soft" genres as chat columns, infotainment news, cartoons, and advertisements, where the norms of (informal) speaking rather than writing are followed, including the Cantonese-English mixed code. Indeed, the more tabloid-like the newspaper, the more one could expect to find Cantonese elements, especially in the back pages. Hard news stories appear to be the only exception to this rule. Hence Cantonese is the only southern dialect that has developed a written language rivaling the Northern Mandarin-based standard written Chinese (Chen 1999: 51; cf. Snow 2004).

44.4.1 Hong Kong Special Administrative Region

With over 7.07 million inhabitants (as of February 2012) living on a land space of around 1,050 square kilometers, HKSAR is one of the most densely populated places in the world. Over 95 percent of the population is ethnic Chinese; of these, nine out of ten use Cantonese as their usual (home) language. A few other regional Chinese varieties are spoken by older people and new immigrants, but their numbers are negligible and they tend to understand and speak at least some Cantonese.

After the return of sovereignty to China, English remains an important language in such domains as government, education, business, and law. Putonghua is now a compulsory school subject in primary school and an optional examination subject in the Hong Kong Diploma of Secondary Education. The HKSAR government recognizes the importance of a workforce equipped with English and Putonghua skills. Every year, huge amounts of resources are made available to various institutions in the education sector from primary to tertiary levels to help students improve their competence in these two important international/regional languages and to promote their literacy skills in English and Chinese. This language policy goal came to be known as “bilingualism and trilingualism” (两文三语).

Cantonese is the most prestigious Chinese dialect that rivals the status of Putonghua in the Pearl River Delta region. There are several reasons for this. In addition to the sui-generis economic success of the “Pearl of the Orient” (more recently: “Asia’s World City”) and the relative affluence of its inhabitants, coupled with the fact that Cantonese is the language of popular consumables ranging from Cantopop CDs to Hollywood-style blockbusters, Cantonese is increasingly perceived by younger generations as an integral part of their Hong Kong (Chinese) identity. Many mainland Chinese are interested in learning it as an additional language or dialect.

There are, however, some indications that the golden age of Cantonese as an additional language or dialect may have peaked following the economic downturns since 1998. One recent development is that Hong Kong’s economic well-being is increasingly dependent on the spending patterns of mainland tourists and shoppers arriving in large numbers. Since relatively few of these Putonghua-speaking visitors from the north understand or speak Cantonese, more and more local shop owners and assistants and others in the hospitality industries (e.g., hotel employees and travel agency personnel) are taking the initiative to learn some Putonghua. No wonder knowledge of Putonghua is one important or even required skill in many local job adverts.

44.4.2 Macao Special Administrative Region

Situated in the estuary of the Pearl River Delta some 40 nautical miles to the west of Hong Kong, Macao is a former Portuguese enclave with a total land area of about 30 square kilometers; it is home to over half a million people (542,200, as of January 2010). Like Hong Kong, the majority of the inhabitants in Macao have Cantonese as their usual (home) language.

Unlike Hong Kong, however, little significance is attached to Portuguese, the language of the former colonizers. As the colonial government was not very keen in promoting Portuguese, there were very few fluent speakers of Portuguese.⁵ In this regard, little has changed in the postcolonial era. There are signs that Putonghua is getting more important; knowledge of Modern Standard Chinese is a requirement for joining the civil service.

Economically, Macao is probably best known for its gaming industry and tourism. Many casinos and luxury hotels have been opened since the return of sovereignty to China in 1999. In recent years, China’s “Monte Carlo of the Orient” has outperformed other gaming capitals such as Las Vegas in terms of total revenues. In the tourism sector, the MSAR government’s successful application in 2005 to add Macao to China’s “UNESCO World Heritage List” is like a magnet attracting tourists and business travelers from different parts of the world. The need to interact with English-speaking and Putonghua-speaking visitors every day has generated a great demand for learning English and Putonghua. The principal economic activities in Macao thus help explain why English and Putonghua are increasingly important in the SAR’s manpower planning.

44.5 PROSPECTS OF PUTONGHUA AS AN INTERNATIONAL LINGUA FRANCA

As a national lingua franca, Mandarin has the largest number of speakers in the world. It is one of the six working languages of the United Nations. Thanks to the rise of China as a global political and economic player in the new millennium, more and more people outside of Greater China are attracted to learning Chinese as an additional language. There is some indication that Putonghua is slowly evolving into an international lingua franca; witness, for example, the rapid increase in the number of Confucius Institutes worldwide (more than 300 as of January 2012), and the Swedish government’s plan to make Chinese a mandatory school subject in primary and secondary schools starting in 2020 (“Every School Must Teach Chinese” 2011).

NOTES

1. In Singapore, Standard Chinese is called *Hiayau* 华语, literally ‘language of Han Chinese.’ The norms of speaking and writing are largely modeled on those in mainland China, including the use of simplified characters.
2. The other two important goals are (a) the codification and standardization of Modern Standard Chinese, spoken and written and (b) the simplification of Chinese characters.
3. The corresponding ‘us’ designation is *benshengren* 本省人, literally ‘people of this province’, referring to descendants of early settlers who have always belonged to Taiwan.

4. Japanese was imposed for fifty years during the colonial period (1895–1945). Guoyu was mandated beginning in 1949 under the Nationalist Kuomintang government.
5. There is a small group of Macanese of mixed Portuguese and Asian descent (less than 10,000 as of 2006). Many Macanese are professionals fluent in Portuguese and Cantonese; some have a good knowledge of English as well. During the colonial era, they served as middle persons between Portuguese officials and local Chinese.

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CHAPTER 45

SOME BASIC AND SALIENT LINGUISTIC FEATURES ACROSS CHINESE SPEECH COMMUNITIES FROM A CORPUS LINGUISTICS PERSPECTIVE

BENJAMIN K. TSOU AND OI YEE KWONG

45.1 INTRODUCTION

To systematically study the characteristics of a language, especially the differences across various communities where it is spoken, a sufficiently large amount of comparable linguistic data is critical. Corpus-based approaches are particularly helpful in this regard (see, e.g., Kennedy 1998; McEnery and Wilson 2001). In the linguistic domain, a corpus (plural: corpora) refers to a large collection of naturally occurring text or speech, collected systematically with representative samples and often annotated at various linguistic levels. Smaller corpora of single works or authors have been developed for linguistic studies in the pre-electronic days. In recent years, the advancement of information technology and the Internet have opened up new opportunities for the cultivation and utilization of large curated textual corpora, enabling various language phenomena to be monitored and tracked from the linguistic perspective and investigated not only per se but also with respect to the underlying social and cultural variations (Tsou et al. 1998).

45.2 CORPUS-BASED APPROACH TO STUDY THE LINGUISTIC CHARACTERISTICS OF CHINESE

Our discussion is based on the continuous analysis of massive Chinese news media texts from several major speech communities in the unique synchronous Linguistic Variation in Chinese Speech Communities (LIVAC) corpus (<http://www.livac.org>).¹

From its inception in 1995, LIVAC has been designed to accumulatively analyze massive newspaper material sampled regularly and synchronously from representative media in six Chinese speech communities, namely Hong Kong, Beijing, Taipei, Singapore, Shanghai, and Macao, and its coverage has been extended to cover other communities such as Guangzhou and Shenzhen. The textual materials cover a wide variety of domains, including front-page news stories, local news, international news, editorials, sports news, entertainment news, and financial news.

LIVAC's innovative design makes it one of the important Chinese corpora in computational linguistics, among its contemporaries like the Peking University Corpus (Yu et al. 2002), Sinica Corpus (Huang and Chen 1992), Penn Chinese Treebank (Xue et al. 2005), and later the Lancaster Corpus of Mandarin Chinese (McEnery and Xiao 2004) and the Chinese Gigaword Corpus (Graff and Chen 2003), as well as many smaller corpora compiled for more specialized purposes.

By 2013, over 500 million characters of parallel newspaper texts had been analyzed. After the continuous strings of characters in the texts are automatically tokenized, or segmented into words, the results are manually verified: 1.7 million distinct word types have been obtained in the curated LIVAC corpus. The findings presented here are based on the analysis of these words and the texts in which they are embedded.

Distinct from many other existing balanced corpora or specialized corpora, LIVAC is unique for being *synchronous* as well as *homothematic* because of considerable overlap in the thematic materials reported at the same time in the Pan-Chinese media. Such textual materials thus provide for an innovative "window" approach for a whole variety of comparative studies and useful applications in the computer processing of natural language. As such, it is also a good example of a *monitoring* corpus.

45.3 CHARACTERS VERSUS WORDS

One of the foremost considerations in analyzing Chinese, for computational purpose or many other purposes alike, is the important distinction between *characters* (字) and *words* (词). Because of its morphosyllabic nature and logographic writing system, the average syllable/character per word in Chinese has been a regular subject of interest and

discussion. Chinese words can thus be monosyllabic (formed with one single character) but more often are disyllabic or even multisyllabic in practice, especially if one takes native speakers' intuition and psychological reality into account. However, Chinese word length remains a fuzzy concept, and there are considerable variations because calculations have not been based on uniform standards of word segmentation. Thus it is crucial to compare the average syllable/word ratios between different textual materials based on a set of well-defined criteria commonly applied throughout the segmentation process, which would then enable us not only to determine global characteristics of texts in Chinese newspapers but also to fairly compare among specific textual types such as newspaper headlines and different domains such as political, financial, or sports coverage and language used across various Chinese speech communities.

Based on a subset of the LIVAC data containing about 1.6 million characters, a comparison of the average word lengths observed from various communities is shown in Table 44.1. It is apparent that the average word in Chinese has 1.75 characters (and hence 1.75 syllables), with the Beijing and Taipei average about 2.5% more than that of Hong Kong and Guangzhou.

Questions on the minimal number of Chinese characters and words needed to read newspapers impinge on long-standing issues regarding the literacy threshold in the Chinese language. As a matter of concern from the greater part of a century, the most commonly used 3,000 characters (三千常用字) have often been referred to as the threshold requirement for basic education and for the eradication of illiteracy.

Figure 45.1 shows the incremental coverage of characters found in Chinese newspapers of different Chinese communities, based on the analysis of the aforementioned subset of synchronous data from LIVAC, using uniform segmentation standards.

The curves in Figure 45.1 overlap considerably, and as the legends indicate, the steepest curve refers to Singapore, followed by Taipei, Hong Kong, Macao, and Shanghai. As shown there, for all communities alike, the most frequent 450 to 550 characters of each community would have already covered 80% of all characters found in its newspaper texts. The coverage approaches 100% with the most frequent

Table 45.1 Character-to-word ratio across different Chinese communities

| Region | Average Word Length (Characters) |
|-----------|----------------------------------|
| Hong Kong | 1.74 |
| Macao | 1.76 |
| Taipei | 1.77 |
| Singapore | 1.76 |
| Shanghai | 1.73 |
| Beijing | 1.78 |
| Guangzhou | 1.73 |
| Overall | 1.75 |

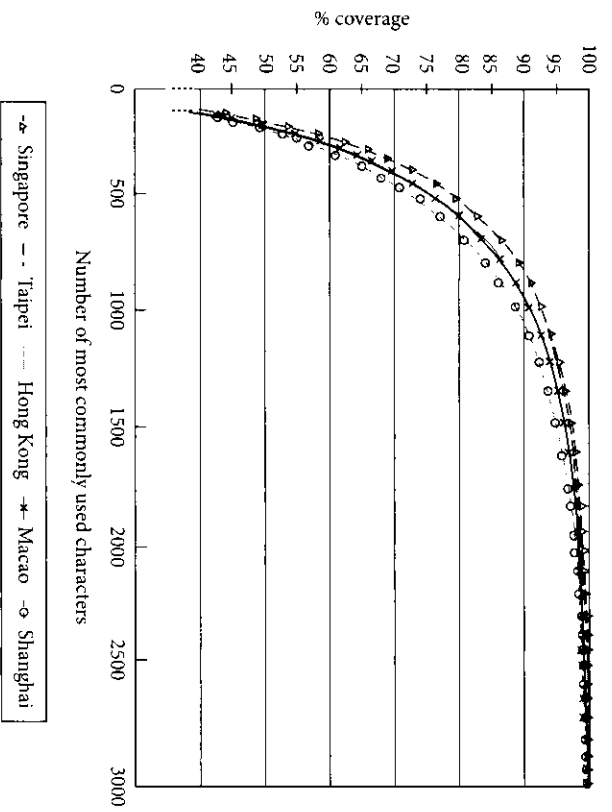


FIGURE 45.1 Coverage of characters (字) in newspapers

2,500 to 3,000 characters. In other words, if we assume 80% comprehension of the characters in a newspaper as adequate threshold, the traditional idea of needing 3,000 most common characters to eradicate illiteracy is far from correct, because at the character level only one-sixth is needed. Nevertheless, recognition of characters does not imply full comprehension of texts. At the same time, it is noteworthy that the basic sets of the 450 to 550 most frequent characters from the different communities are not identical.

Given that the average word length in Chinese is about 1.75 characters, as shown in Table 45.1, knowledge of single characters alone is insufficient to understand the Chinese language. For example, the opposite ordering of constituent characters can result in different words, for example, *di-shi* 的士 'taxi' and *shi-di* 士的 'stick'. Thus we need to examine the use of common words in newspapers, as presented in Figure 45.2. Again, the curves exhibit a similar trend, and the steepest curve refers to Singapore, followed by Taipei, Hong Kong, Macao, and Shanghai.

It would seem from Figure 45.2 that at the word level, the most common 2,500 to 3,500 words would have covered 80% of all words in newspaper texts in any Chinese community, while on average the top 10,000 words would reach 93% coverage for all communities. Given the 80% threshold, it would seem that the 3,000 most common words would be an adequate minimum threshold for literacy, and the wisdom of past thinking applies more appropriately to the level of the *word* (词) and not *character* (字). Moreover, it should be realized that for an individual to enjoy more comfortable literacy, especially in the Pan-Chinese context, doubling this number of words or even more would be reasonable (Cheng 1998).

Despite the similar trends in character and word coverage, there is, however, considerable difference observed in the actual usage of words across various Chinese speech communities. For example, the subcorpora of Beijing, Hong Kong, and Taipei share about 0.9 million words in a fourteen-year period. As can be seen in Figure 45.3, only an average of 25% of these words have appeared in all three communities, whereas over half of the words found in each community are not commonly found in the others, though many may be readily understood. Focusing on words that occur only in two communities, it is not surprising but interesting to note that in the fourteen-year-long period under study, the overlaps between Hong Kong and Beijing (10.7%) and Hong Kong and Taipei (9.3%) are significantly higher than the overlap between Taipei and Beijing (7.1%). This could well be a reflection of nearly half a century of political separation between Taipei and Beijing and of the intermediary role played by Hong Kong between the two.

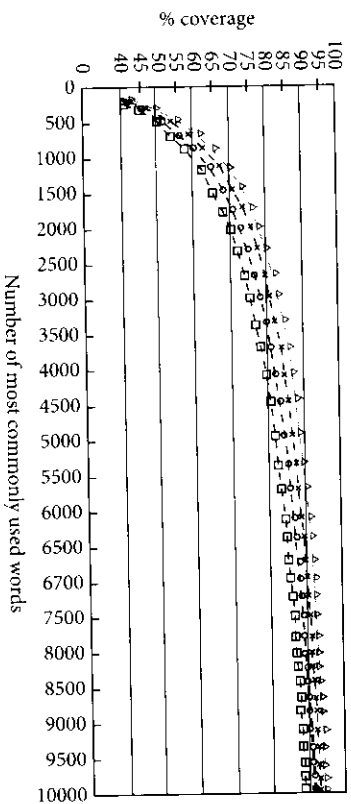


FIGURE 45.2 Coverage of words (词) in newspapers

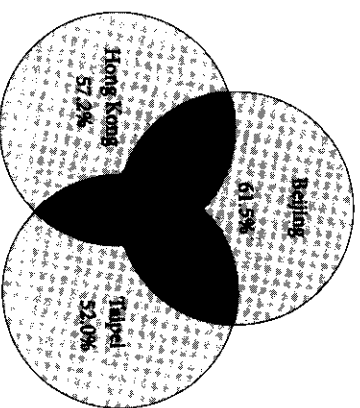


FIGURE 45.3 Overlapping words in Beijing, Taipei, and Hong Kong vocabulary

If we change the window size in terms of time and location, we can see other variations that suggest considerably different developments within individual communities and dynamic interactions among them.

45.4 NONUNIQUE PARTS OF SPEECH

From Section 45.3, we can expect the linguistic differences to be manifested in different ways. The use of individual words operating in the grammar system with different parts of speech (POS) is a good way to view linguistic unity and diversity across the communities.

The problem of POS variation or categorial ambiguity (i.e., ambiguity in grammatical category), especially between nouns and verbs as well as adjectives and verbs, has been of considerable concern. For instance, one may “suspect” something, and he or she may be “suspicious” of something, and that thing is his or her “suspicion.” While it assumes different forms when used as a verb, an adjective, or a noun, respectively, in English, Chinese uses the same disyllabic word *huayi* 怀疑 in all situations, with or without any grammatical word like *de* 的. Many contemporary Chinese grammarians are of the mind that Chinese words have predefined (innate) grammatical categories even though it has no overt morphological mark-up, as in English, and that they should not be contingent upon the grammatical function the words take in particular sentences (e.g., Zhu 2001). But in practice a significant percentage of words that have a predefined POS are often used with another, as we shall see in this section. For example, just like the proper noun Google (referring to the website), which can often be used as a verb to mean looking for information with the search engine in that website, as in “she has been *googled* a lot,” the Chinese proper noun *Weibo* 微博 (Chinese equivalent of “Facebook” or “Twitter”) can similarly function as a verb, for example, 每天上网或用手机传短信 [微博]一下, 上传自己的工作、旅游、生活照片 getting online or using mobile phones to “weibo” for a while every day, posting one’s pictures from work, travel, or casual activities.¹

This phenomenon can pose a dilemma not only for the language users and learners but also for comparative and practical analysis of the Chinese language, including machine translation and other natural language processing efforts. On the one hand, the theoretical and lexicographic concerns are to keep the whole classification of Chinese syntactic categories straightforward, so that all words can be prescribed a category and all categories can be adequately described. On the other hand, the practical concern is to understand the extent of such POS shifts. This perennial and classical problem in Chinese POS tagging has been handled differently in the past (e.g., CKIP 1993; Yu et al. 1998; Xia 2000). For instance, regarding the fluidity between verbs and nouns, Xia (2000) assigned a verb tag if the word is used as a verb and a noun tag if it is used as a noun, whereas CKIP (1993) assigned a single tag to a given word but used features to

encode specific grammatical functions in the text, such as using [+nom] to indicate a nominalized usage of a verb. In Kwong and Tsou (2003), a suggestion was made that the two concerns could be compromised, possibly via the tagset, and the mutual relation could then be maintained between the treatment of categorially fluid words and empirical evidence.

We consider categorial fluidity a continuum, from genuine ambiguities to specific cases of “word play,” and categorial shift to be not static but reflecting a dynamic transitional process between these two ends. Thus we can distinguish three levels of ambiguity, namely *regular ambiguity*, *transitional ambiguity*, and *innovative ambiguity*. We adopted a corpus-based working definition of nominalization, which applied to verbs appearing in one of the following five contexts: (i) directly preceded by a number and numeral classifier, (ii) directly modified by an adjectival phrase, (iii) directly modified by a noun, (iv) as a modifier in a nominal phrase, or (v) directly used as the object of *you* 有 ‘to have’. The phenomenon was studied with a synchronous subcorpus of LIVAC consisting of about 104,000 word tokens for Hong Kong data, 97,000 word tokens for Beijing data, and 74,000 word tokens for Taipei data. As expected, the type-token ratios are found to be similar for all three text sources. The texts were segmented into words, and each word was manually POS tagged.

With all verbs exhibiting noun or nominalized usages extracted from the corpora together with the corresponding frequencies, a simple ratio was computed for all these words as follows:

$$r = \log_2 \left(\frac{\text{verb uses}}{\text{noun uses}} \right)$$

The log ratio gives a linear scale. If verb usage outnumbers noun usage to a certain extent (i.e., when $r \gg 0$), it is very likely that the word is originally a verb and has just begun to shift. If verb usage and noun usage are more or less equal (i.e., when $r \approx 0$), then either the shift is mature enough or there is genuine ambiguity. Meanwhile, if noun usage outnumbers verb usage significantly (i.e., when $r \ll 0$), it would mean that either the verb has over shifted or the word is originally a noun and is occasionally denominalized.

Some overall results and examples are shown in Table 45.2.

Our findings show that, in real use, one in about seven commonly used verbs in Chinese show categorial fluidity in the Pan-Chinese context. Furthermore, Beijing texts show 3% to 4% more nominalized usage of verbs than Hong Kong and Taipei. Such innovation could lead to a new genre of writing. Table 45.3 shows asymmetry between deverbialization of verbs and denominalization of nouns across the three communities on some individual items, with sample sentences given in Table 45.4.

Table 45.2 Categorical fluidity between verb and noun categories

| $r \geq 1$ | $1 > r > -1$ | $r \leq -1$ | | | |
|--------------------------|--------------|----------------------------|---------|---------------------------|---------|
| Example | r | Example | | | |
| 了解 understand(ing) | 4.1699 | 安排 arrangement | 0.8074 | 活动 be active (activities) | -4.9542 |
| 爱 love | 4.1699 | 支援 support | 0.8074 | 增长 grow(th) | -4.4263 |
| 怀疑 doubt | 4.1699 | 保障 protection | 0.2226 | 优惠 favour | -4.3923 |
| 直播 live broadcast | 4.0875 | 轰炸 bombing | 0.1926 | 反应 reaction | -4.1699 |
| 保留 reserve (reservation) | 4.0000 | 上市 listing on stock market | 0.1769 | 选举 election | -4.1293 |
| 结束 end | 4.0000 | 建议 suggestion | 0.1255 | 指引 guide (guidance) | -4.0875 |
| 关注 concern | 3.9069 | 影响 influence | -0.0317 | 主管 manage(r) | -3.3219 |
| 加价 inflate (inflation) | 3.8074 | 表演 performance | -0.1375 | 行动 action | -3.3219 |
| 上升 rise | 3.5850 | 限制 restriction | -0.1520 | 监制 produce(r) | -3.1699 |
| 打算 plan | 2.8704 | 规定 regulate (regulation) | -0.1520 | 运动 exercise | -3.0000 |

Table 45.3 Comparison of categorical fluidity of selected lexical items

| VN Word | r (Hong Kong) | r (Beijing) | r (Taiwan) |
|----------------------------|---------------|-------------|------------|
| 宣传 promote (promotion) | -1.3785 | 1.5850 | 0.4854 |
| 合作 cooperate (cooperation) | 1.3785 | -1.1635 | 0.4594 |
| 感受 feel(ing) | 2.8074 | -1.4150 | -1.3219 |

Table 45.4 Examples of categorical fluidity between verb and noun

| Text source | Sentence |
|-------------|--|
| Hong Kong | (a) 难过的时候，她会看看大自然，从一草一木中感受自己的渺小。 (verb usage) When distressed, she would look at nature; from a blade of grass and a single tree, she would feel her own insignificance. |
| Beijing | (b) Dennis 讲感受时既感人又爆笑。(noun usage) It is both touching and amusing when Dennis talks about his feelings. (c) 观众感受到的是一个群体声音和形象的轰炸。(verb usage) What the audience feels is a bombardment of collective sound and image. (d) 这种换位给观众带来的感受很可能是全新的。(noun usage) The feel brought about by the new seating arrangement could be all new. (e) 沈世朋等人……提早感受过节的氛围。(verb usage) Shen and others feel the festive ambience in advance. (f) 不过，最重要的还是合作的方向和感受。(noun usage) But the direction and feeling of cooperation remain most important. |
| Taiwan | |

44.5 INFORMATION CONTENT AND ENTROPY

As noted earlier, the morphosyllabic Chinese language incorporates a relatively unique logographic writing system that is in great contrast to the prevalent alphabetic languages of the world. Such a situation invites comparison on the efficiency and efficacy of the different languages as communication systems whose primary function is to encode and convey information. Studies on entropy (i.e., information content) provide interesting indices on the extent and efficiency that useful information can be or has been encoded or conveyed. It is therefore of interest to compare alphabetic and logographic languages in terms of the most basic graphic components of the writing systems as well as the overall systems.

Table 45.5 shows that the graphic components of the Chinese logographic writing system carries more than double the information of the alphabetic languages. This is not surprising because the logographic writing system of Chinese contains a cognitively salient ideographic component, which is absent in alphabetic languages.

In Table 45.6, we also compare entropy of words in Chinese and English. From Table 45.6 we can see that the Chinese language carries noticeably more information load than English.

We can also compare the entropy of the written language used in the news media of Beijing, Taipei, and Hong Kong in terms of the information content of its news media.

Table 45.7 shows noticeable variations. They invite the suggestion that information content in Hong Kong is less predictable than Taipei and Beijing, which could possibly reflect wider societal management of information content.

Table 45.5 Entropy of graphic components of Chinese (characters) and some alphabetic Western languages

| Language | Entropy |
|----------|---------|
| French | 3.98 |
| Italian | 4.00 |
| Spanish | 4.01 |
| English | 4.03 |
| Russian | 4.35 |
| Chinese | 9.71 |

Note: Chinese data is from Liu et al. (1987) and data of other languages is from Feng (1989).

Table 45.6 Entropy of words of Chinese and English

| Language | Entropy |
|----------|----------|
| English | About 10 |
| Chinese | 11.46 |

Table 45.7 Entropy of Chinese words in Beijing, Taipei, and Hong Kong

| Location | Entropy |
|-----------|---------|
| Beijing | 11.47 |
| Taipei | 11.69 |
| Hong Kong | 11.96 |

Note: Tsou et al. 2005.

45.6 CORPORA AS TIME CAPSULES

Imagine what use could be made of comparing rigorously sampled material from sequential time capsules. Take, for example, regular rosters of popular songs, celebrities, bestselling books, or financial indices that are collected over time. They can provide interesting and indicative overall trends of social and cultural developments in the relevant society.

As a rigorously cultivated synchronous corpus of media texts over a continuous and extensive period, LIVAC can be seen to provide a series of time capsules, not only for studying the development of the Chinese language but also for studying the underlying cultural dynamics of various communities.

Take the case of tracking celebrities and how they are received in Hong Kong. Figure 45.4 shows the use of the nationalistic attribute in Hong Kong on two key officials, Chinese President and Premier over seventeen years from 1995 to 2011, which straddle the political reversion of sovereignty on Hong Kong from Britain to China.

It can be seen that shortly after 1997, Hong Kong media began a significant reduction of the attribute “China (Chinese)” for the leaders in China whereas past Hong Kong media had always added “Chinese” in reference to them. This situation can be compared with Britain and the United States where normally only Prime Minister Cameron and President Obama would be referred to in the indigenous media, but when referring to a third-country leader, the country name would become an attribute (e.g., *German Chancellor Angela Merkel*). This shift in the use of titles in the Hong Kong media can be seen as a notable and speedy cognitive adjustment of nationalistic identity in Hong Kong following its political adjustment on sovereignty. What is of further interest is that

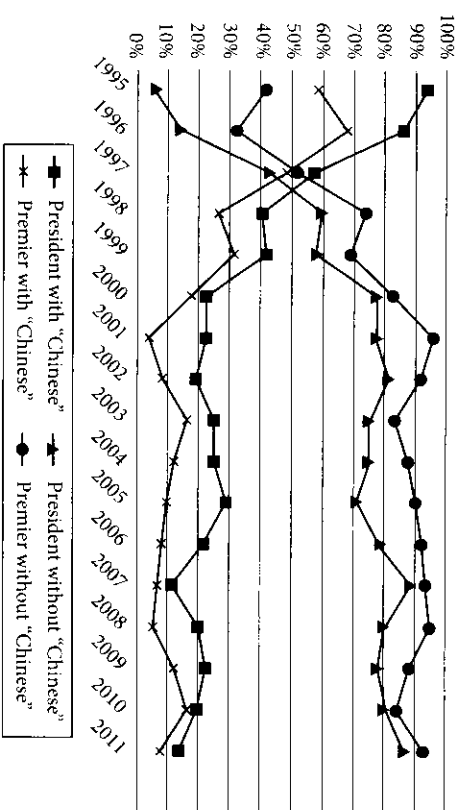


FIGURE 45.4 Use of attribute before national leaders in Hong Kong (1995–2011)

reference to the Prime Minister of Britain in Hong Kong has always included the attribute “British.”

Another good use provided by such time capsules is it can allow us to look systematically at the new words surfacing in the Chinese communities on the whole or individually. These new words relate to new cultural artifacts being foregrounded in society. In the past ten years, new words have been introduced often by prefixing or suffixing. Take the following examples:

a. Words ending with *headword zu 族* ‘tribe’ (referring to a group of people sharing similar characteristics, as identified by themselves or others):

| | |
|-------------------------------|-----------------------------------|
| 「上班族」 (report-work-tribe) | “salary men” |
| 「钟摆族」 (pendulum-tribe) | “the pendulum group” ² |
| 「蜗居族」 (snail-living-tribe) | “small home dwellers” |
| 「纳税族」 (pay-tax-tribe) | “tax-payers” |
| 「兼职族」 (part-time-work-tribe) | “part-time workers” |
| 「网购族」 (Internet-buying-tribe) | “net purchasers” |

These new words show that the traditional blood-tie requirement for “tribe” membership in China has been relaxed, possibly following Japan.

b. Words ending with *nan 男* ‘male’ (referring to a group of males with a shared set characteristics):

| | |
|--------------------------------|-----------------------|
| 「型男」 (cool-man) | “dude” |
| 「宅男」 (house-bound game addict) | “geek” |
| 「筋肉男」 (tendon-muscle-guy) | “muscular man” |
| 「住家男」 (domestic-man) | “househusband” |
| 「体贴男」 (considerate-man) | “considerate man” |
| 「家暴男」 (domestic-violent-man) | “violent male spouse” |

c. Words ending with *nü 女* ‘female’ (referring to a group of females with a similar set of characteristics):

| | |
|-------------------------------|---------------------------------|
| 「熟女」 (mature-girl) | “spinster” |
| 「洗脚女」 (washing-feet-girl) | “foot-masseur” |
| 「下岗女」 (off-position-girl) | “jobless female” |
| 「应召女」 (on-call-girl) | “call girl” |
| 「高职业女」 (high-position-girl) | “well-paid female white collar” |
| 「躁郁女」 (manic-depressive-girl) | “depressed maniacal female” |

What is interesting is that there are more new “male-based” words than “female-based” words, and it would seem that the inequality of the sexes is developing, with greater male role differentiation noted in society.

d. Words starting with *ying* 硬 'hard':

- 「硬资产」 (hard-asset)
 「硬推销」 (hard-sale)
 「硬军事」 (hard-military)
 「硬执行」 (hard-execution)
 「硬方针」 (hard-policy)
 「硬优惠」 (hard-concession)

e. Words starting with *ruan* 软 'soft':

- 「软着陆」 (soft-landing)
 「软商品」 (soft-product)
 「软手腕」 (soft-wrist)
 「软优势」 (soft-advantage)
 「软学科」 (soft-science)
 「软宣传」 (soft-promotion)

It is noteworthy that there are more words associated with "soft" than "hard," which might be explained as an indication of a more flexible disposition than in the past in matters relating to daily life and broader societal developments.

f. Words starting with *ling* 零 'zero':

- 「零团费」 (zero-tour-fee)
 「零成本」 (zero-cost)
 「零意外」 (zero-accident)
 「零容忍」 (zero-tolerance)
 「零交流」 (zero-exchange)
 「零拒绝」 (zero-rejection)

The word *ling* 'zero' is primarily an objective number without connotations. It has evolved to become an attributive marker to mean "the absence of" and could convey concern between extreme cases of noncustomary absence of normal events and of those when they may be expected.

44.7 CONCLUDING REMARKS

The relatively unusual logographic writing system of Chinese, combined with its morphosyllabic structure, invites questions not only on the nature of the language itself but also on larger issues related to language in general and to the society and culture in which language thrives. We have shown that a corpus-based approach taken here

could shed useful light on some of the issues, such as threshold literacy, the structure of words and their subcomponents in a morphosyllabic language like Chinese, grammatical classes of words and their fluidity, efficiency in handling information content (entropy), and consequential lexical developments as windows on social and cultural trends underlying the speech communities.

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NOTES

1. LIVAC was launched by the Language Information Sciences Research Centre of the City University of Hong Kong in 1995 (Tsou and Lai 2003) and between 2010 and 2013 was maintained by the Research Centre on Linguistics and Language Information Sciences of the Hong Kong Institute of Education. Since July 2013, it has been dynamically maintained by Chilin (HK) Ltd, a spinoff from CityU Enterprises Ltd.
2. Usually spousal pairs who have fixed assets, live apart in different locations, and commute on weekends.

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CHAPTER 46

CODESWITCHING

LI, WEI

46.1 CODESWITCHING AND OTHER

TYPES OF BILINGUAL SPEECH

PRODUCTION: TERMINOLOGICAL AND
METHODOLOGICAL ISSUES

BILINGUAL speech production takes places in many different forms, ranging from implicit influence of one language on the speech production in another language to frequent alternation between different languages. The following are some examples:

- (1) “Can you open the light?”
- (2) Mother: *Nei mut-ye a?*
 (Cantonese. *What do you want to eat?*)
- Son: (1.0) *Just apples.*
- Mother: Just /n/ just apples? *Dingai m sik yoghurt a?*
 (Cantonese. *Why not have some yoghurt?*)
- (3) *Ngaw wei solve di problem*
 (Cantonese. *I will, that/those. I will solve that problem.*)
- (4) *I have cha del-ed chulai*
 (*de*—Chinese case marker. *I have checked.*)
- (5) *Traditional de, simplified/de* (*de*—Chinese case marker)
- (6) *She asked me, ‘nei ha m ha-ppy la?’ So I told her, ‘ho m happy la.’*
 (Cantonese. *You NEG. PART. very PART. Are you happy or not? Very unhappy.*)
- (7) *Sho shemme ping!*
 (Mandarin. *What. What shopping*)

Example (1) is produced by a Chinese-English bilingual speaker and is an example of what might be called *interference* or *transfer*. It sounds non-native and could be regarded as a learner error. It is triggered by a mismatch between two collocations: *kai deng* (literally 'open light') in Chinese and *switch on light* in English. The Chinese verb *kai* is in fact a polysemic word and can be used with a variety of objects such as *kai men* 'open the door', *kai hui* 'have a meeting', *kai che* 'drive a car', *kai huo* 'fire', and *kai yan* 'start a show'. However, on its own, it is often translated as 'open', which seems to be the meaning that is generalized to other usages by Chinese-English bilinguals. In producing such an utterance, the speaker seems to be thinking in one language yet producing another. Psycholinguists would argue that the English production has gone through a Chinese filter, or mental translation process.

Example (2) is an instance of a frequently occurring type of codeswitching. In a given episode of interaction, the speakers may choose to use different languages in consecutive turns, as in the first two turns in the example. This would be interturn and interspeaker codeswitching. When one of the speakers changes her choice of language in a subsequent turn, as the mother does in the example, we have an example of interturn but intraspeaker codeswitching, that is, the same speaker codeswitching in different turns. Furthermore, when the mother switches from English to Cantonese within the same turn, we have an example of intraturn and intraspeaker codeswitching.

Example (3) contains instances of both *interclausal* and *intraclausal* codeswitching. *Interclausal* codeswitching is sometimes also called *intersentential*, as some people use the notion of *sentence* in their analysis of bilingual speech. However, this can cause confusion because interclausal codeswitching can occur within what technically may be described as a sentence. Indeed, some people use the term *intrasentential* codeswitching to refer to instances of interclausal codeswitching. In the meantime, intraclausal codeswitching can take many different and complex forms, as examples (4) through (7) show.

Examples (4) through (7) illustrate various kinds of morphological codeswitching. However, in (4) and (5), the marking is ambiguous. In Chinese, the completion of an action can be marked by *de*, which sounds very similar to the English present perfect marker *-ed*. While the English auxiliary *have* may suggest that it is *-ed* that the speaker produced, the Chinese intensifier *chulai* 'done' suggests that it could be *de* as well. Such double marking is by no means rare in bilingual speech, where the speaker produces compromised structures, leaving the interpretation to the hearer. Example (5) involves a Chinese marker that has the same phonological form but this time marking adjective. We can be sure that the *de* after traditional is definitely Chinese, but the one after *simply* is ambiguous.

Examples (6) and (7) involve splitting two-syllable English words and inserting a Chinese element in between. The speakers are evidently following a commonly occurring Chinese discourse strategy, which is to insert elements into the so-called splittable words, standard two-syllable words that involve syntactic relations of various kinds (Siewierska et al. 2010). For example, the Chinese word *shuizhao* 'sleep' can be made into *shui lan jiao* 'have a lazy sleep' and *bangmang* 'help' into *bang da mang* 'offer a big help'.

In the present examples, Chinese elements are inserted in unspittable English words. Again, the end product seems to have gone through a Chinese filter.

There is much controversy as to whether some or all of these examples should be described as instances of codeswitching. Indeed, on what grounds can we distinguish codeswitching from other language-contact phenomena that involve mixing elements from different languages, such as lexical or syntactic borrowing, linguistic convergence, pidginization, and creolization? Moreover, should alternation between different dialects, registers, and styles of the same language be regarded as codeswitching as well? The term *codeswitching* seems to imply two things: (i) it can be a linguistic code of various kinds; indeed, some have suggested that the underlying mechanisms for codeswitching and style-shifting are very similar (Milroy and Gordon 2003: chapter 8); (ii) the speaker can switch back and forward between different codes. This second point has led some researchers to argue that in codeswitching the speaker must know the equivalents in different languages or language varieties and has a choice of which code to use in the given context. It is further suggested that codeswitching usually takes the form of overt, unintegrated elements from different languages or language varieties, thus differentiating it from *borrowing*, which is usually integrated into the recipient linguistic system.

Muysken (2000) offers a typology of codeswitching, namely (i) insertion, (ii) alternation, and (iii) congruent lexicalization, each inviting a particular structural analysis. In the insertional type of codeswitching, one language will determine the overall structure into which constituents from another language are inserted. Example (3) above is of the insertional type. Various grammatical models exist to account for the different roles played by the different languages (e.g., Myers-Scotton 1997). In alternation, on the other hand, different languages occur alternately, each with its own structure, with the switch point being located at a major syntactic boundary. Example (2) is an example of alternation. At exactly which point in the exchange an alternation takes place seems to be governed by both grammatical constraints (e.g., Poplack 1980) and interactional principles (Auer 1984; Li 2005). In the third type, congruent lexicalization, the grammatical structure is shared by the contributing languages, and a succession of single lexical items from different languages is selected seemingly randomly. This type of codeswitching tends to occur between typologically similar languages, especially where there is no tradition of overt language separation and where the contributing varieties have roughly equal prestige. It is likely to occur among speakers of similar Chinese dialects who alternate phonological and morphological forms from different dialects in a lexically congruent utterance.

A very different way of defining codeswitching is proposed by Poplack (2004). Following the variationist sociolinguistic principles, Poplack first establishes, on quantitative grounds, that "lone other-language items are by far the most important—in some cases, virtually the only!—component of mixed discourse," and "multiword other-language fragments, other than tags and other frozen forms, while frequent in some communities, is in the aggregate relatively rare" (590). She then sets out to compare the lone other-language items with their counterparts in both the donor and recipient languages: "If the rate and distribution of morphological marking and/or syntactic

positioning of the lone other-language items show quantitative parallels to those of their counterparts in the recipient language, while at the same time differing from relevant patterns in the donor language; the lone other-language items should be considered as *borrowing*. In borrowing, only the grammar of the recipient language is operative. On the other hand, if the lone other-language items "pattern with their counterparts in the monolingual donor language, while at the same time differing from the patterns of the unmixed recipient language" (591), they are examples of codeswitching.

Once these two broad types of bilingual phenomena are distinguished, we can compare the sociolinguistic norms of the communities in which they occur. Poplack (2004) identifies four community norms of combining languages intrasententially: (i) smooth code-switching at equivalence sites, (ii) flagged codeswitching, (iii) constituent insertion, and (iv) nonce borrowing. This typology enables not only a more careful distinction between the various linguistic manifestations of language contact but also a systematic examination of the key factors influencing the use of codeswitching over and above the grammatical constraints that affect the location in the sentence of the codeswitching.

46.2 MOTIVATIONS: WHY DO BILINGUALS ENGAGE IN CODESWITCHING?

The typologies of codeswitching proposed by Muysken (2000) and Poplack (2004) raise the issue of what motivates bilingual speakers in codeswitching. Why can't bilinguals speak one language only or one language at a time? After all, these ideologies are prevalent in many situations, especially those that involve young children (e.g., Li and Wu 2009). The community norm as Poplack has described it is clearly a factor: in some communities, codeswitching is the normal discourse mode, and most speakers who switch frequently between languages are bilingual. But in other communities, codeswitching is used in specific contexts and conveys special communicative meanings.

Many myths surround the reasons for why bilinguals engage in codeswitching. To those who have little personal experience with codeswitching, it is sometimes seen as a sign of lack of mental control or confusion. Young children, therefore, are often discouraged from codeswitching even though their parents and other adults they regularly interact with are habitual codeswitchers. Even distinguished scholars sometimes claim that bilinguals codeswitch because they have temporary word-finding difficulties. Yet existing research evidence all points to the fact that codeswitching requires a high level of cognitive control, involving neural networks known as the executive system in the brain, as well as a good knowledge of the grammatical systems of the different languages. Uncontrolled codeswitching has been observed in only a handful of patients who have suffered specific brain damage. John Gumperz was among the first to distinguish between factors that are external to the speaker from those that are internal that

trigger codeswitching. He called the former *situational* and the latter *metaphorical* (see Blom and Gumperz 1972; Gumperz 1982).

The external or situational factors for codeswitching may include the setting of the interaction, the participants and the relationships among them, as well as the topic of the exchange. In situational codeswitching, the change of language usually corresponds to changes in the situation; for example, in many parts of China, speakers use local dialects at home but speak a localized standard Putonghua in semipublic settings and change to more standard Putonghua when speaking to a nonlocal person. As Blom and Gumperz (1972:425) comment, "the notion of situational switching assumes a direct relationship between language and social situation." Subsequently, it is possible to formulate predictive models of codeswitching at the community level. More recently, sociolinguists have spent a considerable amount of time analyzing the history of language contact as well as linguistic ideologies of the communities under investigation to argue that sociocultural values, power relations, and identity are all factors that can motivate codeswitching of specific kinds.

The internal factors, in comparison, are mainly to do the speaker's intention to convey specific communicative effects through codeswitching, and they tend to do so when there is no change in participants, setting, or topic. Codeswitching is therefore used as a "metaphor." Gumperz (1982) identifies a number of communicative functions of metaphorical codeswitching, including quotation, addressee specification, interjection, reiteration, message qualification, and personalization versus objectivization. Other functions can easily be identified and added to this list.

Myers-Scotton (e.g., 1993) tried to bring the external and external factors together into an integrated model of the social motivations of codeswitching, namely the markedness model, which has been recast as a rational choice model. She argues that bilinguals have an innate theory of socially relevant markedness and indexicality of the different languages and language varieties. This theory enables them to make rational choices in social interaction by calculating the costs and benefits of their actions. The centerpiece of the markedness model is a "negotiation principle," which directs speakers to choose the form of one's conversational contribution such that it symbolizes the set of rights and obligations that they wish to be in force between the participants for the present exchange. Bilingual speakers can make unmarked choices in cases where situational factors change during the course of a conversation or marked choices when they wish to disidentify with the unmarked rights and obligations set for the interaction and negotiate a change in the social distance between the participants.

Myers-Scotton (1993) suggests that the bilingual speaker's innate knowledge of the markedness and indexicality of the various linguistic codes not only provides a normative framework for them to make choices but also limits the interpretations of codeswitching; that is, participants interpret each other's moves with reference to the rights and obligations set. One problem with such an approach is that the meaning of codeswitching is the accumulation of the associations between linguistic varieties and conventionalized conversational exchanges. Linguistic codes come to index a particular rights and obligations set because they are regularly used in a particular interaction

type. Codeswitching itself does not seem to be constitutive or creative, as interaction merely consists of the reproduction or reification of preexisting meanings. There has been considerable debate over the question of how much of the meaning of codeswitching is "brought along" and how much of it is "brought about" in interaction (Li 1989). The markedness theory of codeswitching emphasizes the "brought along" meaning. The languages involved in codeswitching have distinctive social, symbolic values, which simply have to be indexed in the interaction in order to become, or to remain, relevant. The alternative is to focus on the emergent character of the meaning of codeswitching in interaction: meaning emerges as a consequence of bilingual participants' contextualization work. It is "brought about" by the speakers through the very act of codeswitching.

46.3 PATTERNS AND STRUCTURES: HOW DO BILINGUALS CODESWITCH?

Another common myth of codeswitching is that it is a random behavior. This has turned to be a rather complex myth to dispel. Linguists with a particular interest in structural patterns of codeswitching have tried to develop various models to account for the mixed code constructions they have observed with various language combinations. But the predictive power of the models remains weak, as outliers and counterexamples are frequently cited. Nevertheless, the majority of researchers agree that in most cases codeswitching is well formed and conforms to the grammatical structures of the contributing languages. The disagreement is over the question of whether there are universal grammatical constraints that operate in all language combinations. What lies at the heart of the disagreement seems to be the issue of whether codeswitching should be regarded as part of the speaker's linguistic *competence* or *performance*. Linguists approaching codeswitching from a competence perspective tend to argue that codeswitching patterns can be and should be accounted for within the general, and primarily generative, frameworks without evoking any codeswitching-specific mechanisms (e.g., MacSwan 1999). Yet even those linguists who insist on codeswitching-specific constraints often appeal to the notion of competence. Myers-Scotton, for example, described her matrix language frame model as a "bilingual language competence model" (1993, 2002; Myers-Scotton and Jake 1995).

One point that seems to have often been missed in the search for the patterns and structures of codeswitching is that it is essentially an interactional strategy that bilingual speakers deploy either in response to other participants' moves or to indicate their own, specific communicative intents. The sequential organization of codeswitching in talk-in-interaction therefore should be given priority over other structural considerations. Indeed, from the speaker's point of view, the immediate interactional task is to find what he or she would regard as the most appropriate language to use for his or her speaking turns. The intricacies of the grammatical structural juxtaposition, important

as they may be, are only secondary considerations and may in any case depend heavily on the speaker's proficiencies in the different languages as well as other sociolinguistic considerations. Using the analytic framework provided by Conversation Analysis, Auer (e.g., 1984) identified a number of sequential patterns of language choice in bilingual conversation.

To those who are interested in both the structural patterning as well as the meaning of codeswitching, the Conversation Analysis approach has at least two advantages. First, it gives priority to what Auer (1984) calls the "sequential implicativeness" of language choices in conversation, that is, the effect of a participant's choice of language at a particular point in the conversation on subsequent language choices by the same and other participants. Second, it "limits the external analyst's interpretational leeway because it relates his or her interpretation back to the members' mutual understanding of their utterances as manifest in their behavior" (Auer 1984:6). There is a tendency in codeswitching research to attribute macrosocietal value to individual instances of switching and to assume that speakers intend such meaning to be understood by their cointeractants. Analysts who adopt the Conversation Analysis approach argue that while codeswitching is indeed a socially significant behavior, their task is to try to show how their analyses are demonstratively relevant to the participants. One must not assume that, in any given conversation, speakers switch languages in order to "index" speaker identity, attitudes, power relations, formality, and so on; rather one must be able to demonstrate how such things as identity, attitude, and relationship are presented, understood, accepted, rejected, or changed in the process of interaction. These points imply an important shift of analytic focus. While there are clear links between the motivations (*why*) and the patterns and structures (*how*) of codeswitching, any interpretation of the *why* questions must come after fully examining the *how* questions, that is, the ways in which the participants locally constitute the phenomena.

46.4 FROM CODESWITCHING TO TRANSLANGUAGING: TOWARD A POETICS OF MULTILINGUAL INTERACTION

Taking codeswitching seriously as a conversational activity also means looking at it not simply as a juxtaposition of different grammatical structures but as an expressive act, a creative performance. While we focus on the details such as phonetic and morphological integration, sequential organization, co-occurrence of pauses, loudness, and other paralinguistic features, we must also give greater attention to context and the consequentiality of the performative, the act of codeswitching. As anthropological linguists such as Hymes (1981), Bauman (1984), and Sherzer (2002) demonstrate, in what they call ethno-poetics, each performance is keyed and relies on a performer's assumption of responsibility for the emergent event. Ethno-poetics as a performance theory is an

analysis of the rich convergence of the performer, the situation and setting, the audience, and the wider society. It recognizes that the symbolic forms have their primary existence in the action of people and their roots in social and cultural life. It also recognizes that not all performances are equal. Full performance involves a level of competence that produces artistry or creativity, though measures of competency are to be discovered in each situation and with awareness of local measures of creativity. Less than full performance, on the other hand, may give us clues as to the performers' individual capacity, their sociocultural background and position, as well as their relationships with and the culture of the social group and the audience (see further Hymes 1981; Bauman 1984; Sherzer 2002).

From the perspective of performance theory, codeswitching is a creative and critical act that multilingual language users perform in specific social contexts for specific purposes. As part of a large research project on the multilingual practices of ethnic minority children in heritage language schools in four urban centers in Britain, I have tried to examine the structural, cognitive, and sociocultural dimensions of codeswitching by the British-Chinese children in an integrated way and have focused on the children's creativity and criticality that manifest in their multilingual practices.

Example (8) is taken from a recording of a Mandarin session in a London Chinese school. The school was set up as a Cantonese school. The majority of children in this school are Cantonese-English bilinguals, but since 2001, Mandarin is also offered to all children. One of the tensions in the Chinese complementary school classrooms is between the traditional way of teaching and what is appropriate for this particular group of Chinese pupils. In the example, the teacher has asked the class to make sentences with the Chinese adverb *jiu 就*. This is a particularly complex word, as it has several meanings, including *at once*, *as early as*, *just about*, *really*, *simply*, *exactly*, and so on, and it can be used for various functions. G1 responded to the teacher and made a sentence with the target word. The teacher asked the class whether or not G1 got the sentence right. This is a typical teaching method in Chinese classrooms, where the teacher asks the pupils to point out each other's mistakes and correct them collectively. In written examinations, 'correcting mistakes' is often used as a method of assessing the learner's linguistic knowledge. However, as we can see in the example, the pupils think that this kind of pedagogical activity is picking on people, not just pointing out the language errors. There seem to be two kinds of cultural expectations and practices at work here.

(8) (G1: girl in class; T: teacher; B1 and B2: boys in class)

G1: *Ta jiu xiang shuizhao.* (他就想睡觉)

'He really/just wants to sleep.'

T: Good. Is there any mistake in what she said?

(no response from pupils)

T: (To B1) XXX, what do you think?

B1: *Mji la?* (唔知啦)

NEG. Know PART.

'Don't know.'

T: (To B2) XX, *ni ne?* (你呢)
You PART.

'How about you?'

B2: *Wo ye mu ji.* (我也唔知/母鸡)

I also

'I also don't know/ am a hen.'

All laughed loudly.

T: Stop it. *Anjing.* (安静) Be quiet.

Silence.

B1: Can we do something else?

T: *Xian shuo wanle zheige.* (先说完了这个)

'Let's finish talking about this first.'

B2: *Why zongyao tiao renjia cuo a?* (总要挑人家错啊)

always pick other people mistake PART.

'Why do we always pick on other's mistakes?'

When the class did not respond to her initial question, the teacher specified B1 and asked him to say whether he thought G1 had produced a correct sentence with the target word. B1 responded in Cantonese as he is a Cantonese first-language speaker and he knew that the teacher also understood Cantonese. His response consists of a typical Cantonese negation marker *m*, a verb *ji* 'know', and an utterance particle *la*. I have spelled these out in Roman letters as the pronunciation here is a crucial factor. When the teacher turned to B2 and asked for his opinion, B2 made a pun by simply adding a vowel to the Cantonese negation marker. However, *mu* in Mandarin means *female*, and *ji* in Mandarin means *chicken*. By changing the pronunciation from *m ji* to *muji*, B2 made the phrase into *I am also a hen*. Cantonese-Mandarin bilinguals would understand the pun easily, and the whole class laughed. G2 thus gained some authority in the classroom context. When the teacher tried to stop him making fun of the activity, both boys, B1 and B2, protested and asked the teacher to change the activity to something different. B2's direct question to the teacher challenges the pedagogical practice.

There is another even subtler but perhaps more important point of the two boys' responses to the teacher in this example. Remember that this is a Mandarin session to a group of children, most of whom are Cantonese-English bilinguals. They are learning Mandarin as an additional language. Mandarin is being actively promoted in the Chinese community in Britain as a new Chinese lingua franca to connect with mainland China and is fast gaining currency at least in formal settings. Official visits by the Chinese embassy staff to the local Chinese community organizations are always conducted in Mandarin, and cultural events such as the Chinese New Year celebrations are increasingly done in Mandarin as well. Mandarin has also replaced Cantonese in much of the satellite television and other entertainment media in Europe. Even Cantonese-speaking parents often encourage their children to learn Mandarin at the Chinese school. However, enthusiasm for Mandarin is not universal in the Chinese diasporas. There are groups who feel a stronger affinity to Hong Kong and nostalgia for the pre-1997 life in the former British colony. They see the spread of Mandarin as another

example of the increasing power and influence of the Chinese government in Beijing. Even among people who are not directly linked to Hong Kong, there are those who see the spread of Mandarin as a threat to the Cantonese cultural heritage. Recent reports from Guangdong province of mainland China of public protests against the testing of Mandarin proficiency for people who wish to hold public offices and the increasing use of Mandarin in the media are examples of the popular unease. What we do not know is how the British-born generations of Chinese children and young people feel about the elevated status of Mandarin vis-à-vis Cantonese. While we cannot be absolutely sure why B1 chose to respond to the teacher in the present example in Cantonese, his choice of language, and B2's making fun of it, certainly has the effect of undermining the purpose of the class, which is to teach Mandarin.

The highly creative nature of the multilingual practices as seen in this example calls for an alternative conceptualization and terminology to the existing ones of codeswitching. What the children in our examples are doing is *translanguaging*, both going between different linguistic codes and structures and going beyond them (Li 2011). These include the full range of linguistic performances of multilingual language users for purposes that transcend the combination of structures, the alternation between systems, the transmission of information, and the representation of values, identities, and relationships. Translanguaging provides a clear example of multicompetence.

To many bilingual speakers, codeswitching is a routine, rapid, and unremarkable linguistic behavior. Yet there is a widespread perception that such behavior is somehow out of the ordinary, abnormal, or deviant. There is a pervasive belief in society, bilingual and monolingual alike, that languages are best to be kept separate, discreet, and pure; mixing and switching between languages are seen as an interference or as trespassing, which would have a detrimental effect on both individual language users and the communities in which they live. While considerable progress has been made in understanding what motivates bilingual speakers to engage in codeswitching and the complex nature of the structural configuration of codeswitching in interaction, more work is clearly needed in order to dispel the many myths and fears that still surround this defining bilingual behavior. For any future work, the different dimensions of codeswitching—the structural, the cognitive, and the social—ought to be examined as an integrated whole. Codeswitching is a highly dynamic and creative behavior that requires analytic approaches that transcend traditional disciplinary boundaries. But above all, it cannot be regarded as a disembodied superorganic object. It needs to be studied in situ, that is, in the interactional, linguistic, historical, and ideological contexts.

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CHAPTER 47

GENDER DIFFERENCES
IN CHINESE SPEECH
COMMUNITIES

DAMING XU

47.1 INTRODUCTION

As in the literature of the studies of many other languages, there are abundant descriptions and explanations of gender differences in the literature of Chinese linguistics. The Chinese literature about cultural stereotypes and linguistic performances not only supports the general theory of language and gender but also exemplifies its application in specific contexts. However, a number of recent studies in Chinese sociolinguistics have raised issues regarding gender differences with certain results of community investigations. Consequently, this chapter focuses on those issues by placing them in the general perspectives of language and gender.

Gender differences refer to the differences between males and females in their social behaviors, while sex differences usually look at the physiological differences between men and women (Parke and Clarke-Stewart 2010). Gender differences in language can mean how gender-related concepts are represented by linguistic forms. For instance, in English a third-person singular pronoun indicates the sex of the referent, while in spoken Chinese, the third-person singular pronoun *tā* 'she/he' does not distinguish gender. Meanwhile, researchers also focus on how males and females use language differently. For instance, it was reported that women tend to use more standard forms and men tend to use more local forms in English communities (Trudgill 1974; Labov 1966; among others). This is also found in Chinese communities (Xu 2007; Van den Berg and Xu 2010, among others). While gender differences of the representational type are studied in cultural perspectives or framed in a social theory such as feminism, those concerning language use more properly fall into the realm of sociolinguistics. For the former the readers can refer to R. Sun (2010), W. Sun (2009), Chiang (1996), and others, and

an interesting discussion on whether Chinese is not a gender-biased language can be found in Ceccagno (2006). Moreover, in recent years a variant of the Chinese script called *wushu* 'female script' was discovered. The script was used exclusively by women in certain dialectal areas in China for hundreds of years (Zhao 1991). There are many fascinating topics like these concerning gender and the Chinese language (see also M. Chan 1998). However, in a sociolinguistic chapter in a volume on Chinese linguistics, the current debate about gender in Chinese should take priority.

47.2 GENDER ISSUES IN SOCIOLINGUISTICS

There are two major branches of sociolinguistic research: the variationist and the interactional sociolinguistics. Both contribute significantly toward the study of language and gender (Lakoff 1975; Eckert 1990; Tannen 1994; Wodak and Benke 1997; Tabot 2010, among others). The variationist studies are noted for their documentation of women's preference for the standard forms in various speech communities and the discovery of women's roles in the social mechanism of language change (Cheshire 2002). The interactional studies are noted for their description of different discourse and interactional patterns employed by men and women and the several theories explaining the patterns (Baxter 2004). The two strands of research complement each other. The variationists reveal many hitherto unnoticed gender differences in language use, while the social interactionists lead the turn from essentialism to social constructionism. We address the issue of social constructionism in Section 46.5. First we need to review the issue on the constraining effect of gender in variationist studies, which can then serve as the basis for further discussion.

Variationists study linguistic variation by investigating speech communities. In their investigations, a number of social factors, of which gender is one, are found to constrain the variation together with linguistic constraints. Henceforth the social factors are defined as social constraints. The social constraints include a long list of sociodemographic factors, but on top of the list are social class, gender, style, and a few others. Consequently, the results of the speech community investigation show a pattern of sociolinguistic constraints, which consists of a set of linguistic and social constraints. The constraint patterns tend to vary from community to community in their exact contents, but some patterns become familiar because they show up time and again. The constraint patterns of linguistic variation uncovered by the early sociolinguistic studies always included the constraint of gender (Labov 1966, 1972, among others), and this was also replicated by hundreds of studies conducted in many different communities (Fasold 1990; Chambers 1995; Labov 2000; Xu 2007, among others). With time, more knowledge has been gained about the language use of women: It is probably not that women always prefer the standard forms but rather that women tend to lead language change (Labov 2000). Whatever the case is, the constraining effects of gender appear omnipresent.

However, a number of investigations on Chinese speech communities have yielded different results (H. Chan 1984; Xu 1992; Huang 2000; Rau 2001; Chen 2004; among others). In those studies, although some other social constraints were uncovered, the gender effect did not emerge. These results raised the issue of whether or not the gender constraint, previously shown to be an apparent sociolinguistic universal, would fail as such (Chambers 1995; Xu 2004a, among others). In the following sections I introduce one such investigation and then connect it with others.

47.3 THE KUNDULUN COMMUNITY INVESTIGATION

A sociolinguistic investigation was conducted in the Kundulun community of Baotou City in China in 1987 (Xu 1992, 1993). The investigation followed the standard procedures of the variationist approach, but the findings were strikingly different from those of other investigations at that time. Among the differences, the lack of gender constraining effect stood out. In a variationist study, linguistic variation is defined as a number of linguistic variables, which are then examined with a set of linguistic and social factors as potential constraints. Those factors found to effectively constrain a variable are included in its sociolinguistic constraint pattern. The sociolinguistic constraint patterns of the variables represent an evaluative system shared by members of a speech community (Labov 1972). The Kundulun study focused on three linguistic variables of the Mandarin spoken in the community, namely *nasalization*, *deletion*, and *retroflexion*, representing a range of phonological variations with the nasal finals of Mandarin. Table 47.1 gives the sociolinguistic constraint patterns of these three variables.

As is shown in Table 47.1, different variables were constrained differently, with varying numbers of linguistic and social constraints. This is expected, as it shows the diffusion of variation in the linguistic system and in the speech community. However, while a good number of linguistic constraints were found for all the variables, only a few social constraints were found for some of the variables. Moreover, no effective social constraints were found for the variable of *retroflexion*. Compared to the "normal" sociolinguistic constraint patterns at that time, the relative lack of social constraint effects in the Kundulun community appears to be bizarre. Compared to the familiar ones in the literature, these patterns appear as though they were incomplete.

The Kundulun speech community was reinvestigated in 2003–2006, sixteen years after its first investigation. The same methodology was adopted and the same linguistic variables were reexamined with a newly collected set of data. Table 47.2 gives the sociolinguistic constraint patterns as part of the results of the investigation. As can be seen, this time the patterns resembled much more the "normal" ones. Many more social

Table 47.1 Sociolinguistic constraint patterns extracted from the 1987 data

| Variable | Sociolinguistic Constraint Patterns | |
|--------------|-------------------------------------|-------------------|
| | Linguistic Constraint | Social Constraint |
| Nasalization | Onset | Occupation |
| | Vowel | Place of origin |
| | Nasal deletion | Social network |
| | Stress | |
| | Adjoining nasalization | |
| Deletion | Nasal final category | |
| | Retroflexion | |
| | Onset | Occupation |
| | Vowel | Speech style |
| | Nasalization | |
| Retroflexion | Stress | |
| | Tone | |
| | Nasal final category | |
| | Adjoining nasalization | |
| | Onset | |
| Nasalization | Vowel | |
| | Nasalization | |
| | Tone | |
| | Nasal final category | |

constraints were included and, specifically, the variable of *retroflexion* included some social constraints as well. Importantly, the constraint of gender was found with *nasalization*, although still not for *deletion* and *retroflexion*.

The changes in the sociolinguistic patterns are now thought to reflect a process of speech community formation (Xu 2010). However, because the former investigation was the first of its kind carried out in China, its investigator was unaware of the fact that the Kundulun community differed from those investigated in the West at the time in that it was a "new town," a planned industrial urban center whose population is mostly made up of migrant families.

The sociolinguistic patterns obtained for Kundulun in 1987 reflect an early stage of speech community formation. The Kundulun community of 1987, generally speaking, consisted of only two generations. The adult generation was all migrants who had moved into the community successively since 1956 when Kundulun was first made an urban center and the younger generation consisted of children of the migrants. The migrants spoke a wide range of Chinese dialects, most of which were subdialects of Mandarin. After decades of speech interactions and accommodations in the community, the adult speakers should have made many adjustments in their speech. Consequently, we hypothesize that at the time of the investigation in 1987, a speech community had already emerged over the dialect contact situation of Kundulun. This hypothesis was

Table 47.2 Sociolinguistic constraint patterns extracted from the 2003–2006 data

| Variable | Sociolinguistic Constraint Patterns | |
|--------------|-------------------------------------|-------------------|
| | Linguistic Constraint | Social Constraint |
| Nasalization | Onset | Occupation |
| | Vowel | Speech style |
| | Nasal deletion | Place of origin |
| | Stress | Social network |
| | Adjoining nasalization | Education |
| | Nasal final category | Age |
| | Retroflexion | Gender |
| | Tone | |
| | On-glide | |
| | Following segment | |
| Deletion | Onset | Occupation |
| | Vowel | Speech style |
| | Nasalization | Place of origin |
| | Stress | Social network |
| | Tone | Education |
| | Nasal final category | Age |
| | Retroflexion | |
| | On-glide | |
| | Following segment | |
| | Onset | Occupation |
| Retroflexion | Onset | Speech style |
| | Vowel | Place of origin |
| | Nasalization | Social network |
| | Tone | Education |
| | Deletion | |
| | Following segment | |

supported by the sociolinguistic patterns found, since a sociolinguistic constraint pattern is a defining feature of a speech community (Labov 1972; Patrick 2002; Xu 2004b). However, as the aforementioned sociolinguistic constraint patterns show, this speech community was still quite underdeveloped, in contrast to such urban communities as New York (Labov 1966), Norwich (Trudgill 1974), or Shanghai (Shen 1993).

At the time of the second investigation, although there were already three generations including two predominantly native-born, the Kundulun community was still relatively new, with a good proportion of newly arrived migrants. As shown in the sociolinguistic literature, linguistically a new town is characterized by koineization (Kerwill and Williams 2000) and formation of a new speech community (Xu 2010).

Given the fact that the gender constraint is always found in a mature speech community, we wondered why it was still absent with two of the variables at the time of the second Kundulun investigation in 2003–2006. The partial absence of the gender effect

is indicative of the developing nature of the community, despite the fact that it seemed to have already advanced a step in maturation from what it was in the 1980s. With the ongoing trend of development, in due time, the two variables will also be constrained by gender, evidence that the speech community has further developed.

47.4 GENDER AND THE SPEECH COMMUNITY

The Kundulun case shows the relationship between gender and the speech community. When the community first emerged in 1987, it was “gender-less.” Sixteen years later it started to respond to the gender constraint but was still unlike the fully gender-constrained mature speech communities. As the theory of speech community dictates, a speech community is not any aggregation of speakers but a social organization of speakers with its own disciplines and appeals (Gumperz 1968; Patrick 2002; Xu 2004b, 2006). Among the defining features of a speech community is the shared evaluative system of speech, embodied by the sociolinguistic constraint patterns of linguistic variables (Labov 1972, 2000). Therefore, as the Kundulun case has shown, the inception and enlargement of the sociolinguistic constraint patterns are symptoms of the birth and growth of the speech community.

The studies of koineization show the special functions of native-born generations (Kerwill and Williams 2000). Similarly, the native-born speakers are pivotal in the formation of a new speech community. As a supplementary piece of evidence, a finer analysis of the variables of *nasalization*, *deletion*, and *retroflexion* from the Kundulun data shows that there was much more agreement among the native-born than the migrants in speech behaviors and in speech evaluations.

Absence of gender constraint may not indicate that the males and females all speak the same way, but it indicates that at the level of the community a system in evaluating gender difference is not yet established. A speech community is a product of sustained interactions of a group of speakers and the evaluative system is a natural outcome of their protracted practices. The early sociolinguistic studies revealed the social structure of a (mature) speech community, but it was not until we studied speech community formation that we came to know how it had ended up there (Xu 2011; Otheguy et al. 2012).

Gender differences in language use are fostered since childhood (Lakoff 1975; Labov 2000; Baxter 2004, among others). However, this all happens in particular communities, and each in its particular way. Therefore, with the increased number of native-born and natively brought-up speakers, the social conventions of gendered linguistic behavior were being established in the Kundulun community.

Of other studies that show the absence of gender effects, Chen (2004) needs special mention. Chen studied variation in Taiwan Min by investigating the Toa-gu-tiau 大牛栏 community in Taoyuan 桃园 County, Taiwan. Of the six linguistic variables examined by Chen, only one showed some gender-constraining effect. As explained by Chen, the

exceptional variable was *devoicing*, and the gender effect was created by the large number of Hakka women who were married into the community.

Interestingly, in the Toa-gu-tiau case it was the migrants who created the gender effect, while they were the cause of the lack of gender effect in the Kundulun case. This needs some explanation. In the case of Kundulun, since they were with various dialectal backgrounds, the migrants could not agree on the pattern of variation. Conversely, in the case of Toa-gu-tiau, the gender group was made up predominantly of speakers of the same dialectal backgrounds. A group of migrant women brought the *devoicing* feature from their previous community, and it surfaced as a gender effect in the current community because of their large number in the local female population. Consequently, the Kundulun and the Toa-gu-tiau cases both support the hypothesis that for a gender constraint to be included in the community's constraint patterns, there must be a sufficiently large number of speakers agreeing on the constraint. Migrants who come from a mature speech community can bring in a gender constraint and transplant it in the host community if they are in such a large number. Meanwhile, in a new community composed of migrants from many different communities, the gender constraint will be absent if there is not a singly large group to carry it over.

As more recent studies show, the lack of gender effects is not restricted to the group of Chinese speech communities (Llamas 2011). Nevertheless, all the communities that do not give the "normal" constraint patterns involve migration, intensive mobility, and language contact. The newly industrialized and urbanized communities are relatively more common in the Chinese-speaking societies in comparison to the societies that have long completed the process of industrialization and urbanization. Incidentally, the latter happened to be where the early sociolinguistic studies were conducted. Thus it was accidental that the developing speech communities were first studied in China. It was also accidental that the lack of gender effect was first noted in Chinese speech communities. However, it is beneficial for us to note that new speech communities tend to develop gender constraint later than some other constraints. This is significant as gender is regarded as the primary social factor that divides the speech community (Chambers 1995; Xu 2004a, among others).

The step-by-step building-up of the constraint patterns of a speech community is reminiscent of the Optimality Theory (OT) proposed by Prince and Smolensky (1993). OT gives an account of the relationship of linguistic universals and diversities. Languages of the world differ from each other because they select different constraints from the pool of universal constraints and combine them in different ways to construct their grammars. Similarly, social constraints like gender and style are also universal. Moreover, as shown in the process of speech community formation, the social constraints are also for selection by speech communities (Xu and Zhang 2011). Language does not have a will, and it cannot really select. It is people who select. We would propose that OT should include social constraints as well as linguistic constraints. The collective behaviors of the members of a speech community make the selection. Just like the procedures of variationist analysis, the community selects from the pool of universal constraints, as much as it can select a linguistic constraint, such as, say, VCC* (Xu and Zhang 2011), it can

select the gender constraint and order it after or before the constraint of *style* or *class* in the sociolinguistic "grammar" of the community.

47.5 THE SOCIAL-CONSTRUCTIONAL APPROACH TO GENDER AND LANGUAGE USE

Studies like the early investigation of Kundulun helped turn sociolinguistics from largely essentialist approaches' to predominantly social constructional approaches. In the latter, speakers are portrayed as actively constructing their identities, including gender identities, through the use of language. In illustrating the projection of a gender identity, a Chinese case of language use can serve as an example. This case, usually called *nyguoyin* 'feminine Mandarin pronunciations', involves a group of students although none of them have explicitly claimed a social constructionist theoretical frame. Among several relevant studies, noteworthy are Hu (1991) and Cao (1987).

Nyguoyin is in fact a linguistic variable of *fronting*, involving a group of palatal consonants in Beijing Mandarin. In natural speech, a palatal is variably pronounced with a fronted position or as a dental sibilant. What is interesting is that the fronted variants are used only by some young female students in Beijing as claimed by Hu (1991) or, although predominantly by young females, occasionally also by some young men, as claimed by Cao (1987). It is also found that variation tends to occur when followed by the vowel /i/. In the variationist term, the *following segment* is therefore a linguistic constraint in the constraint patterns of the variable. Hu (1991) points out that this feature of pronunciation serves to convey a social meaning of "femininity," while Cao (1987) tries to attribute it to dialectal contact influence from a number of southern Chinese dialects that have the fronted pronunciations as a norm. Hu does not believe that any males would use this pronunciation and rejects the dialectal influence explanation on grounds that there was no motivation for Beijing students to imitate a southern dialectal pronunciation. In Hu's explanation, the sounds of the fronted pronunciations symbolize "fragility," which conforms to a traditional cultural image of the Chinese woman. Moreover, in using such a pronunciation the mouth is relatively more closed, which is associated with good manners in speaking for women. As pointed out by Hu, according to traditional teaching, Chinese women should not talk with their mouths wide open.

Nyguoyin has been noted for many decades and is labeled as such owing to its association with the young female group. It is observed that with female speakers, the phenomenon appears around the time of puberty and usually disappears after marriage or in the 30s or 40s. Therefore, it is a stable variable, and at the level of speech community we see no change. In distinguishing variations that indicate changes in progress and those that do not, a type of variation called "age-grading" is defined (Labov 1972; Hockett 1950), and it fits with *nyguoyin*. A typical age-grading variation

observed in some communities, especially in the Western societies, is when people enter workforce their speech starts to include more standard variants, and when they retire those variants tend to disappear. However, in the case of *nvguoyin*, although typically age-grading, it is notably confined to only one gender group. Since it is an identity label for women, Hu does not trust Cao's result that some young men also use it. Here we can see the influence of essentialism. From a social-constructionist point of view, identity expressing is a choice, so even if it is a "femininity" label we cannot deny that some men may use it. Indeed, in Hu's (1991) own studies, he found that some of the young females he studied selectively used the pronunciation for different occasions.

The phenomenon of *nvguoyin* serves as a good example of "doing gender" (Gary 1993; Baxter 2004), one of the speakers' choices (Coulmas 2005). However, we should not forget the limitations of the choices. If the Beijing speech community does not have the notion of *nvguoyin*, the fronted pronunciation may not serve the purpose of expressing the female identity. It may be mistaken as a southern dialectal accent. Indeed, in the case of cross-community communication, the social meaning of a certain pronunciation may not be conveyed properly and can even be wrongly received. It is reported that when men of southern dialectal background come to Beijing, their fronted pronunciations and similar features are interpreted as *niangniangqiang* 'womanish speech' (M. Chan 1998).

47.6 CONCLUSION

In addressing the issue of whether gender is universally present in the social context of language, we propose an OT-like selection theory. The theory states that, although gender is a universal social constraint, its effect on language use has to be filtered through the sociolinguistic patterns of a speech community. The speech community selects from the pools of social and linguistic constraints and forms its specific constraint pattern, which directly governs the language use of the members of the speech community. Consequently, how a speaker performs a gender role and when a hearer expects and hears a gender-indexing utterance are both conventions of a speech community.

In its recent transformation from essentialism to social constructionism, sociolinguistics has focused on various specific community-internal contexts and social organizations such as social networks and communities of practice. However, we should not forget the importance of speech communities for the following reasons: (i) the social meaning of language use is to be interpreted against the backdrop of the common practices of the community, and (ii) the speech community as a social unit can also socially construct itself.

The identity of a speech community, as much as it can be expressed with the selection of a linguistic variety, can be expressed also with the selection of a constraint for

a linguistic variable. In the use of *nvguoyin*, a speaker is consciously or unconsciously expressing a gender identity. Similarly, in the case of Kundulun, the collective practices of members of the community eventually pushed up the gendered expression in nasalization, which is seen as a constraint in the sociolinguistic constraint patterns in the variationist perspective.

The gender constraint on *fronting* has existed for a long time, and many people are aware of it in Beijing, whereas the gender constraint on *nasalization* is just beginning and most people are unaware of it in Kundulun, but both are nevertheless of the same nature: they are the conventions of the speech communities.

NOTES

1. For a critique of essentialist approaches, see Howard and Hollander (2000).

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PART 8

NEURO-
PSYCHOLOGICAL
ASPECTS

EARLY VOCABULARY
LEARNING IN
CHINESE-SPEAKING
CHILDREN

TWILA TARDIF

DESPITE much agreement and cross-linguistic similarity in when children begin to produce words and reach various milestones, there are important differences in the types of words that children begin to produce when they first enter into language. Across a large number of studies, children learning English and many other languages tend to start off their word-learning experiences by learning many different kinds of words for objects. However, the same is not true for children learning Mandarin, Cantonese, or even Korean. This chapter details these differences, using naturalistic observations and transcripts, as well as laboratory-based procedures and large-scale norming studies of vocabulary checklists.

48.1 WHAT IS A WORD TO A CHILD, AND
DO CHILDREN'S "WORDS" DIFFER FROM
ADULTS' WORDS?

Word learning, for both children and adults, requires establishing a mapping between words and concepts. Yet even before this mapping occurs, children need to attend to and identify conceptual units from perceptual inputs (Hollich et al. 2000; Yu et al. 2005; Waxman and Lidz 2006)—and they must do this at a time when their ability to *perceive* and to *form* these conceptual units are undergoing rapid change. Thus the question of “what is a word” has implications broader than the structural and social features of the linguistic elements that make up words for adults.

More complicated yet is the fact that it is difficult to determine when exactly children begin to produce their first words, as well as to specifically identify what these words refer to. Even more challenging is to determine when they begin to understand words, which words they understand, and even which aspects of the words they do and do not understand. The following sections discuss both the findings and the methods for how we discover when and which words children first begin to produce and understand.

48.1.1 When Do Children Learn Their “First Words”?

Although children are reported to begin to *say* their first words around ten months of age (see Table 48.1), the actual process of word learning begins much earlier—with identifying relevant features and units of the speech stream and with identifying basic concepts. At six months, infants are able to reliably comprehend familiar labels for the people who take care of them on a daily basis (Tincoff and Juczycyk 1999): at seven months, they can comprehend their own names even when spoken by an unfamiliar experimenter (Mandel et al. 1995); and at eight months, they are able to comprehend a number of frequently heard words and phrases (Bates et al. 1994; Tardif, Fletcher, Zhang, et al. 2008). Yet how children learn these words is still a topic of great interest to many researchers around the world. The following sections present, first, what we know about the words that children can say and, second, what we know about the words that they can understand.

48.1.2 What Kinds of Words Do Children Learn?

Despite much agreement and cross-linguistic similarity in when children begin to produce words and reach various milestones (see previous discussion, as well as Bornstein et al. 2004), much controversy remains over the types of words children produce beyond their very first word. In explaining commonalities across the first ten to fifty words in English-learning children, Nelson (1973:31), noted that “with very few exceptions, all the [nouns] listed are terms applying to manipulable or movable objects.” In other words, English-speaking children tend to learn the names for things that move and act (agents)

Table 48.1 Mean age in months and standard deviation (in parentheses) of when boys and girls produced their first word in the Cantonese Communicative Development Inventories norming studies conducted by Tardif et al. (2008) and Fenson et al. (1994)

| | Beijing | Hong Kong | US |
|---------|--------------|--------------|--------------|
| Males | 10.58 (2.48) | 10.40 (2.90) | 10.65 (1.53) |
| Females | 9.79 (1.72) | 9.90 (1.97) | 9.68 (1.46) |

or are acted upon directly by the child (manipulable objects). Both the Mandarin- and Cantonese-speaking children in Tardif, Fletcher, Liang, et al.’s (2008) study showed this same pattern for the nouns they acquired, even though they did not acquire as many nouns as the English-speaking children.

Instead, Mandarin-speaking children from Beijing tended to learn terms that named the people around them. Specifically, for children producing only one to five words, an average of 80% of these words referred to people. While words for people were common, also, for speakers of English, only 30% of the first one to five words referred to people. Interestingly, speakers of Hong Kong Cantonese showed a pattern that was intermediate to that of Mandarin and English—with close to 50% of the first one to five words referring to people and a gradual decrease that stayed between the Mandarin and English proportions of people terms with increasing vocabulary size. Thus, across languages, *early nouns tend to be names for the people around them as well as the objects that the infants themselves manipulate.*

Similarities exist also in the verbs acquired by English- and Mandarin-learning children, despite the fact that they enter their vocabularies at different points. Tardif (2006), for instance, reports that for the top twenty verbs learned by sixteen-month-old English- and Mandarin-speaking children in the Communicative Development Inventories norming studies, the vast majority were action verbs (seventeen out of twenty in English, plus three perception/mental-state verbs, and eighteen out of twenty in Mandarin, plus two perception/mental-state verbs). Furthermore, most of these early verbs are transitive (fourteen out of twenty in English, seventeen out of twenty in Mandarin). *Early verbs, in both English and Mandarin, tend to be action verbs performed by familiar agents on familiar objects.*

48.1.3 Chinese-Speaking Children “Say” More Verbs than English-Speaking Children: Evidence from Vocabulary Checklists

Large-scale norming studies using the MacArthur-Bates Communicative Development Inventories, a checklist that parents or other adults use to report on the vocabulary of young children, finds large differences in the relative proportion of nouns and verbs that English- and Mandarin-speaking infants and toddlers are reported to be able to “say” in their early vocabularies. In the following discussion, data from the norming studies of the “Infant” checklists for Mandarin, Cantonese, and English were used with samples sizes of seventy children per age group, half male and half female, from ages eight- to sixteen months. These checklists have a total of almost 400 words, organized into specific categories, from which parents and/or caregivers select the words a child “can say.” For the comparisons reported in the following, a total of nine categories of common nouns (animals, vehicles, toys, food and drink, clothing, body parts, furniture and rooms, small household items, outside things/places) with a total possible number

of words reported as 209, 188, and 182 for the English, Mandarin, and Cantonese forms, respectively, were contrasted with the category of verbs (action words), containing 55, 78, and 64 words, respectively.

As can be seen from Figure 48.1, English-speaking children, from the earliest stages of vocabulary learning through to a point when they have hundreds of words in their vocabularies, have more than nine common nouns for every verb that appears in their vocabulary (i.e., a ratio of nouns/[nouns+verbs] of over 9). In contrast, Mandarin-speaking children start out with more verbs than common nouns and even at vocabulary sizes of 300 to 400 words, common nouns represent no more than double the number of verbs in their total vocabularies (i.e., a ratio of nouns/[nouns+verbs] of .75 or less). These data clearly demonstrate that despite the similarities in the specific words acquired within a word class, there are still large differences when it comes to object versus action words for children acquiring these two languages. Action words in English did not occur in any children below ten months of age and remained low but increased steadily. Mandarin-speaking children, however, showed a different pattern with eight- to ten-month-olds producing a much larger proportion of people terms than English-speaking children and action terms from the very youngest ages. In fact, the number of action terms is equal to or greater than the number of object terms for Mandarin-speaking children from eight to thirteen months of age. At fourteen months, the number of object terms becomes greater than the number of action terms, and this increases until twenty-two months, where it appears to plateau. Action words in Mandarin also continue to rise until twenty-two to twenty-four months, where they plateau, but words for actions consistently represent a higher proportion of

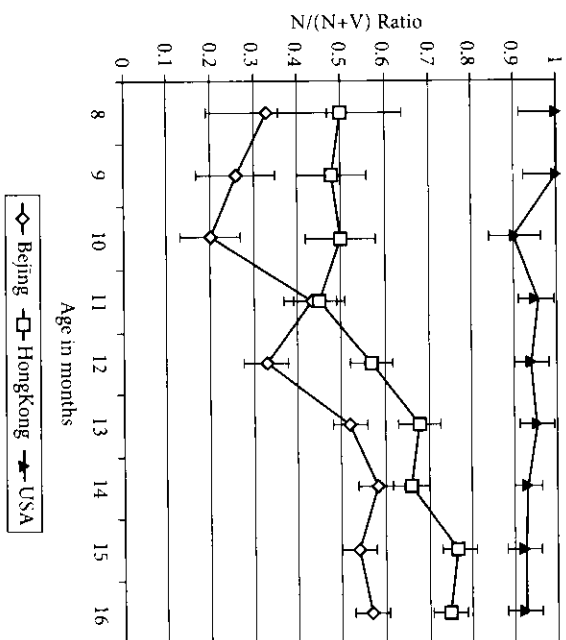


FIGURE 48.1 Proportion of nouns/(nouns + verbs) that child is reported by caregivers to "can say" as a function of age in MacArthur Bates Communicative Development Norming Study for English, Mandarin, and Cantonese (N = 70 children per age group)

overall vocabulary terms for Mandarin- than English-speakers. Similarly, object terms are higher for English-speakers throughout the entire age range of the norming samples. Cantonese-speaking children show a pattern that is intermediate between English and Mandarin, with roughly equal numbers of nouns and verbs in the first few months of productive speech, followed by an increase in the number of nouns that parallels the pattern for Mandarin but with a relatively greater proportion of nouns to verbs in Cantonese yet not as many nouns as same-aged English-speaking children.

48.1.4 Chinese-Speaking Children "Say" More Verbs than English-Speaking Children: Evidence from Naturalistic Studies

These differences are even more evident in the number of words that young children say in their conversations with caregivers and others in their daily lives. As reported by Tardif (1996), nine of the ten children in a Beijing sample of twenty- to twenty-two-month-old toddlers produced more verb types than noun types in a one-hour sample of their everyday speech. Because there are potential differences in the conditions under which these Mandarin-speaking children might have been sampled versus the types of conditions that English-speaking children were sampled in the United States, a follow-up study was conducted that controlled the toys and play contexts for twenty-four similarly aged toddlers in each of Beijing, China, and Ann Arbor, Michigan. In this study, although the play contexts affected the numbers and proportions of nouns and verbs produced, they did so in similar ways across languages, and, regardless of context, cross-linguistic differences were found such that Mandarin-speakers had higher proportions of verbs in their spoken vocabularies than English-speakers in any given context. Nonetheless, across languages, book-reading contexts elicited more nouns than verbs, and play contexts in which interactive mechanical toys were involved elicited more verbs than nouns (Tardif et al. 1999). Thus, across both uncontrolled, naturalistic contexts and in controlled, laboratory contexts, Mandarin-speaking children consistently produced more nouns than verbs in their everyday speech. Moreover, the proportion of verbs produced in everyday speech is even higher than the proportion of verbs parents report children have in their total vocabularies.

48.2 PRODUCTION VERSUS COMPREHENSION: ARE THE WORDS THAT CHILDREN SAY THE SAME AS THE WORDS THEY UNDERSTAND?

One might wonder, therefore, whether this difference in production might also carry over to comprehension. Specifically, do Mandarin-speaking children show the same

kinds of developmental trends (from people terms and verbs to a vocabulary that is more balanced with common nouns) in the words that they understand?

While it is not an easy feat to ascertain, reliably and over a number of children, which words children produce at different stages of acquiring a vocabulary, it is even more difficult to ascertain what words they understand. In order to examine this question, researchers have relied on two methods—vocabulary checklists from parents or caregivers on their assessment of the words that children understand and experimental studies that control for a number of contextual factors and provide a very strict set of criteria for establishing “comprehension” that can vary according to the particular aspects of the word that are considered sufficient for demonstrating comprehension. Recent findings using each of these methods are presented in the following.

48.2.1 Do Chinese-Speaking Children “Understand” More Verbs than English-Speaking Children? Evidence from Vocabulary Checklists

Despite the large number of studies reporting on children’s productive vocabularies, very few studies report on the actual words that children comprehend, even for studies using the MacArthur-Bates Communicative Development Inventories. One exception to this is a study conducted by Caselli and colleagues (1995), which compared the productive and receptive vocabularies of English- and Italian-learning infants on the respective versions of the Communicative Development Inventories. Overall, these two groups of eight- to sixteen-month-old infants were reported to have very similar levels and patterns of vocabulary development, both for production and for comprehension, despite the argument made by the authors that Italian-learning children might be expected to show patterns similar to those shown by Chinese-learning children because of the ability to drop the subject of a sentence in Italian. Interestingly, however, both Cantonese- and Mandarin-learning children show a pattern that is different from either English- or Italian-learning children, and this is most apparent for children’s productive vocabularies but is also evident in early comprehension data, as is shown in Figure 48.2. Whereas English- (and Italian-) learning infants have a strong preponderance of nouns (from 25% to almost 50% of all words reported to be “understood”) in their early vocabularies, Mandarin- and Cantonese-learning children show a greater balance between the number of common nouns and verbs in their vocabularies. Interestingly, however, English-learning children are reported to be less noun-biased and understand more verbs in the words that they understand than the words that they are reported to be able to say. Similarly, Cantonese- and Mandarin-learning children are reported to have relatively more nouns and relatively fewer verbs that they understand than the words that they are reported to be able to say. Thus it appears that *parents’ reports of the words that English- versus Mandarin- and Cantonese-learning children are able to understand are more similar than the words that they are able to say.*

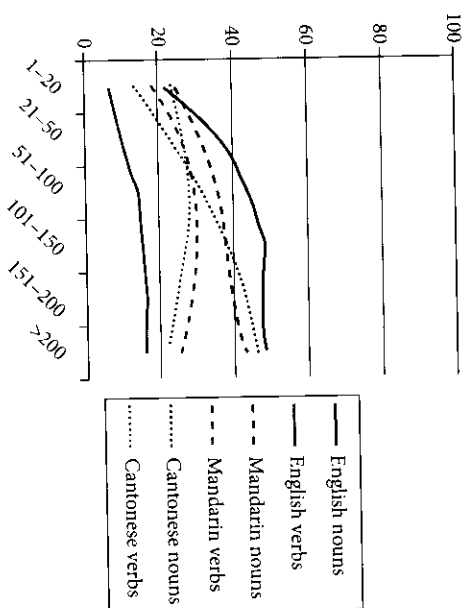


FIGURE 48.2 Percent of common nouns and verbs that child is reported by caregivers to “understand” as a total words understood in MacArthur Bates Communicative Development Norming Study for English, Mandarin, and Cantonese (with data from Caselli et al. 1995, Table 3, and Tardif et al. 2010)

48.2.2 Do Chinese-Speaking Children “Learn” Verbs More Readily than English-Speaking Children? Evidence from Experimental Studies

A number of studies examining English-speaking children’s early word comprehension in experimental settings that carefully manipulate the ways in which words are presented and tested have found interesting similarities and differences in the ways in which children learn labels for objects versus actions (Pruden et al. 2006; Brandone et al. 2007). For both types of words, children are found to rely on perceptual salience more heavily before they integrate social information, and this sequence is identical in both object and action-word learning. However, English-learning children appear to take longer to master the integration of multiple cues when learning labels for actions than they do to learn labels for objects (Brandone et al. 2007). Such findings suggest that children are able to use a combination of linguistic and nonlinguistic cues to learn nouns earlier than they are for verbs. However, given that most of these studies were conducted with English-learning children, and children learning Mandarin do not share the same patterns of acquisition in either their productive language or in the words that they are reported to comprehend, it is important to consider whether these same patterns would hold for the learning of new words in Mandarin.

If the language that one learns and the culture one is exposed to have deep and pervasive impacts on the types of words one is expected to learn, then it would not be surprising for learners of Mandarin to find it easier to learn verbs than learners of English. Given the existing data on both production and comprehension, moreover, it would be

interesting to see if Mandarin-learning children show a "bias" in these studies toward verbs (as is seen from the very early production findings), or whether they would be more balanced in their acquisition of both nouns and verbs (as is seen in the reports of infants' comprehension). Indeed, this is a very exciting question and, to date, there are only three studies that have examined this question with direct comparisons between English- and Mandarin-learning children.

The first set of studies, conducted by Imai and colleagues (2008), looked at Japanese, English, and Mandarin-speaking three- and five-year-olds' performance on a controlled experimental task, in which children viewed videos of an actor performing unfamiliar actions on unfamiliar objects and found, much to the authors' and others' surprise, that Mandarin-learning children performed much worse on the verb-learning condition than either the English- or Japanese-learning children. Specifically, when children heard audio with morphosyntactic cues for whether the novel label referred to the action or the object (e.g., "Ni kan! Ayi zai jing2 yige dongxi!"—Look! She's *daxing* it!), children in all three languages extended novel nouns more readily than novel verbs, with the poorest performance in the verb condition for the Mandarin speakers. This is at odds with the previously found patterns in Mandarin that verbs were earlier to appear and much more frequent in children's vocabularies than they were in English. The authors explain this discrepancy by noting that the Mandarin-learning children in their study were more sensitive to extralinguistic contextual factors such as the appearance of a "still" frame immediately before the videotape of the action in the verb-learning condition. These authors argued further that the relatively greater number of verbs in Mandarin-learning children's early vocabularies may be more related to the overwhelming amount of support for verb learning in the gestures and frequencies of verbs in adult-to-child speech, as well as increased opportunities for producing them in everyday contexts of Chinese languages and cultures. Given this, Imai and colleagues suggested that verbs may actually be *harder to learn* in Mandarin than they are in English or Japanese and the fact that children know (i.e., produce and comprehend) more of them is simply because they have had many more opportunities to learn and produce them. Although this is an intriguing argument and deserves close follow-up, two further studies with younger children suggest that this pattern may be unique to the specific experimental conditions and to stimuli used in this study and/or perhaps also to the inclusion of preschool- and school-aged children, as opposed to the much younger children examined in previous comparisons of Mandarin- and English-learning children.

The first study of novel word learning comparing infant learners of Mandarin with infant learners of English was conducted by Chan et al. (2011) and used an experimental design to investigate novel word mapping with fourteen- and eighteen-month-old infants. In this study, the Habituation-Switch method (Werker et al. 1998) was used to both minimize and control, across languages and across word types, the pragmatic and linguistic cues that might be available in naturalistic word-learning situations (e.g., Tardif et al. 1997; Snedeker et al. 2003; Lee and Naigles 2005). Specifically, English- and Mandarin-learning fourteen- and eighteen-month-olds were shown, separately, two separate scenes of a woman performing a novel action on a novel object. Each of

these scenes was paired with a novel "word" that followed the phonotactic properties of children's early words in English (for English-learning infants) or Mandarin (for Mandarin-learning infants). These scenes were presented for 30 seconds at a time until the infants were no longer interested in looking at (i.e., were "habituated" to) either scene. Once this had occurred over two presentations of each of these scenes, infants entered into the "test" phase of the experiment in which they saw one of the two scenes paired with its usual (familiar and expected) auditory label (the "Same" trial) and the other scene paired with a familiar but unexpected label (the "Switch" trial). Infants who learned and remembered the correct mapping between the scenes and their labels were expected to look longer at the "Switch" trial (because it was a novel pairing) and to remain habituated to the "Same" trial. Given the very minimal cues given to both English- and Mandarin-learning infants, we then examined the infants' ability to map novel labels with objects versus actions and whether this differed for either of the language groups at fourteen versus eighteen months of age.

In this study, English-learning infants were able to map the novel labels in the object switch condition, whereas the Mandarin-learning infants were not able to do so. Instead, Mandarin-learning infants were able to map the novel labels in the action switch condition. This is unique in that Mandarin learners showed a different pattern of development than what would be expected from previous experimental word-learning studies. Specifically, both fourteen- and eighteen-month-old Mandarin-learning infants reliably mapped the novel labels to *actions* but *not to objects*. The success in the action condition is consistent with prior data on early vocabulary development of Mandarin-learning infants and toddlers (e.g., Tardif 1996; Tardif et al. 1999; Tardif, Fletcher, Liang et al. 2008; Tardif, Fletcher, Zhang, et al. 2008) obtained from parental checklist interviews and naturalistic observations indicating the early presence of verbs and inconsistent with the Imai et al. (2008) findings with preschoolers discussed previously. One possible interpretation of these data may simply be that Mandarin learners (compared to their English-learning peers) have accumulated more experience in mapping labels to actions through their increased exposure to verbs in adult-to-child speech (Tardif et al. 1997) and their increased production vocabularies for verbs, which may, in turn, have resulted in greater expectations (or affinity) for a word-to-action association in an experimental paradigm. By the time Mandarin-learning children advance to preschool, however, this relative advantage may no longer occur simply because word-learning experiences may have become more noun-focused in the preschool years.

Nonetheless, what was most surprising was Mandarin learners' failure to reliably map words to objects, even at eighteen months of age. Interestingly, mere experience with nouns does not seem to explain this failure. Fifty-one out of the sixty-four Mandarin learners in this study had nouns in their vocabulary as reported on the Communicative Development Inventories checklist. Thus the majority of children in the study had repeated experiences of associating words to objects and demonstrated this in their speech. Further studies comparing Mandarin- and English-learning infants under carefully controlled conditions of learning are clearly warranted, but this study provides preliminary evidence not only that Mandarin-learning children produce and comprehend

more verbs in their early vocabularies than English-learning children but that these differences may translate to long-lasting preferences in how new words are learned for speakers of different languages.

In an unrelated series of studies children's early verb-learning abilities, Waxman and colleagues have also shown that both English- and Mandarin-learning twenty-four-month-olds are able to learn and extend novel verbs in an experimental word-learning paradigm (Waxman et al. 2009; Arunachalam and Waxman 2010; Leddon et al. 2011). Interestingly, these studies, although controlled in their presentation of verbs and actions across languages, provided much more support for learning the novel verbs than either the Chan et al. (2011) or the Imai et al. (2008) study. Specifically, they presented a novel verb several times in full, naturalistic sentences and viewed multiple exemplars of the action to be learned, as well as a contrasting exemplar that was explicitly labeled as "not" the action/verb to be learned. Although these studies have not explicitly compared Mandarin- and English-learning children, nor have they explicitly contrasted the noun- and verb-learning conditions in English and Mandarin, they do provide clear evidence that, given both minimal (as in Chan et al. 2011) or rich (Waxman et al. 2009) experimental conditions, Mandarin-learning children from fourteen to twenty-four months of age are able to learn novel verbs even when they are not provided with the full richness of cues and environmental pressures to produce verbs that they typically receive in speech directed to them by their caregivers.

48.3 SUMMARY: CHINESE CHILDREN'S EARLY VOCABULARY LEARNING—WHAT THEY KNOW AND HOW IT GOT THERE

Nouns and verbs are not the only words that children learn, nor are they the only words that might be different for learners of Mandarin versus other languages. Nonetheless, the past two decades of research have shown clear similarities in the factors that make words easy versus difficult to learn across languages and some interesting differences in *which* words are easier or harder to learn in particular languages. As discussed previously, one of the major ways in which Chinese languages (and perhaps Korean and Mayan languages) differ from English, Italian, German, and other languages, including, perhaps, Japanese, is in the relative prevalence of nouns and verbs in children's early vocabularies. The evidence presented here shows that these differences are strongest for the words that children produce and for the very earliest stages of vocabulary learning. However, they are also present in the words that children are reported to comprehend and, perhaps, in the abilities that children bring to the task of word learning, even in controlled laboratory situations. And yet there are many factors that affect the production, comprehension, and ability to rapidly map meanings onto a word. Even for two closely related Chinese languages such as Cantonese and Mandarin, these factors result

in differences in the proportions of nouns and verbs and extend to phenomena such as the growth of specific classifiers, relative to children's overall vocabulary size (e.g., Tardif et al. 2009).

So what are the factors that make some words more learnable than others, or make it easier to learn verbs in Chinese, for instance, than in English? In terms of semantic properties, recent findings suggest that words that are highly imageable (Ma et al. 2009; McDonough et al. 2011) or specific in meaning (Tardif 2006; Pulverman et al. 2010) tend to be more easily acquired, and many Mandarin verbs used with young children have been found to possess these characteristics. In terms of input, studies have demonstrated the relatively high frequency of verbs in the naturalistic speech of Chinese caregivers, across diverse contexts such as book reading, toy play, and everyday routines (Tardif et al. 1997, 1999). In terms of nonlinguistic cues, when viewing muted videos of mother-child dyads playing together, adult raters were found to have greater success at identifying nouns than verbs when the interaction was in English. When the interaction was in Mandarin, a similar asymmetry was not found (Snedeker et al. 2003). Thus the extent to which both linguistic and nonlinguistic cues support the comprehension and use of nouns versus verbs seems to vary across languages: the same type of cues that highlight nouns over verbs in English may emphasize verbs over nouns at early stages of acquisition and perhaps equally at later stages in Mandarin.

Nonetheless, this review clearly demonstrates a need for future studies that not only provide careful comparisons across languages, controlling for contextual and other factors, but also focus on various stages of word-learning—from the very earliest stages of attention to sounds and concepts, extending to novel word mapping and comprehension. Moreover, there is a need to continue to understand the naturalistic situations in which children learn words so that we can more fully understand the multiple cues that children utilize when they begin to learn, use, and develop their vocabularies.

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CHAPTER 49

CHILDREN'S EARLY PRODUCTION OF PHYSICAL ACTION VERBS IN CHINESE

HELENA HONG GAO

49.1 INTRODUCTION

STUDIES of children's early vocabulary show that 70% of their first 100 words are verbs and the remaining 30% consists mostly of names of movable and manipulative objects that can be used when playing with hands or feet (Tomassello 1992; Gao 2001; Ma et al. 2009; Tardif et al. 2009). Also, more than half of the verbs are found to be typical physical action verbs. These findings show that physical action verbs are children's main lexicon in their early years of life. They are the direct linguistic expressions of human physical activities observed or experienced by children in their everyday life. Movable and dynamic aspects of inanimate objects, human physical activities, and children's own physical involvement in action events are all assumed to have contributed to their early understanding and conscious learning of the domain-specific lexical terms. These stimuli for children to learn are ample, dynamic, and available to children at all ages.

Research on child language development addresses the correlation between cognitive development and language development (Gillette et al. 1999; Dapretto and Bjork 2000; Marchman et al. 2004; Snedeker and Gleitman 2004; Fernald et al. 2006). Domain-specific lexical development, such as children's learning of physical action verbs, can be viewed as having a typical feature for such a correlation. This is because when children start to use physical action verbs that describe various body part actions (e.g., *bite*, *kiss*, *shake*, *knock*, *hit*, *kick*, etc.), their understanding of the lexical terms is essentially based on their own physical experience of the actions. Further more their lexical knowledge can be identified as fully acquired conceptual knowledge. The conceptual knowledge in turn supports children's cognitive understanding of the interaction

between self and other and between their own world and the world around them. Therefore, the types and the ordering of children's learning of physical action verbs may advance parallel with their experience and understanding of the physical world around them.

Children around two years of age become more active in trying their physical capabilities. Their daily activities are no longer simply children's games. They begin to imitate their parents while joyfully helping them with household chores and attending to adults' activities. The action verbs that depict these activities start to enter into children's vocabulary.

In terms of increase of their vocabulary size, there may not be much difference between children speaking different languages. However, the domain-specific lexical features that reflect the social and cultural contexts in which children are brought up, may affect their understanding of the lexical usage with respect to age and context. It is assumed that there is a correlation between the linguistic characteristics of the physical action verbs that the children acquire and the nonlinguistic factors that affect their understanding of the effects and intentions of the physical actions the verbs describe. The linguistic factors may include the semantic types of physical action verbs, such as the polysemous feature of a physical action verb, the synonymous relations among a group of physical action verbs, and the language-specific constructions of verb semantics and syntax. The nonlinguistic factors may possibly include children's cognitive abilities in projecting the trajectories of various kinds of event actions and in understanding the causative effect in perceiving actions with motion, force, speed, direction, and so on, their physical capabilities in participating in various physical action events, and the social and cultural environment in which they were learning the language. To find evidence to support the assumption made, this chapter first analyzes ten Chinese-speaking children's production of physical action verbs within a period of six months and then discusses the relationships between the children's domain-specific lexical knowledge and their nonlinguistic knowledge that supports their language development.

49.2 DATA COLLECTION

The data extracted from the Beijing corpus under the East Asian Corpora of CHILDES (MacWhinney 2000; Tardif 1993, 1999) were from ten families and their toddlers (eight boys, two girls) recorded in a naturalistic setting. All the infants' parents were native speakers of Chinese living in Beijing. The children's mean age was reported to be 21 months and 24 days at the time of the first recording. Within a six-month period, there were altogether 50 one-hour recordings, with five recordings from each child between one year nine months and three days (1;9.3) and two years three months and two days old (2;3.2). The children's mean utterance length was 1.82 ($SD = 0.60$) morphemes per utterance.

49.3 DATA ANALYSIS

In total, 131 physical action verbs were produced by the children. Most of them were used more than once by more than one child. The appendix only shows first-time occurrences of the verbs produced by any of the ten children. Categorically the verbs can be divided into verbs of eye actions, teeth actions, lip actions, mouth actions, shoulder actions, back actions, hand actions, hand actions with a tool, buttock actions, knee actions, foot actions, and whole-body actions. Altogether twelve different body parts were involved in the actions, with hand actions representing the most and foot actions the second most (See Figure 49.1).

In the first recordings, when the children's mean age was twenty-one months and twenty-four days, they used fifty-six physical action verbs, among which seven kinds of body-part involvement were identified. Of the twenty-three hand-action verbs used, seven of them involved tool uses, such as pencil, scissors, toy shovel, toy gun, and knife. Verbs that describe sophisticated actions and whole-body actions were all used appropriately when communicating with their parents and other adults during different game playing sessions and ordinary daily activities.

In the last recordings, when the children's mean age was twenty-five months and twenty days, they used fifty-two more verbs of sophisticated hand actions, eleven of which were verbs of hand actions with tools (e.g., toothbrush, toy tool, crayon, pencil, rag, broom, fish net, and comb). Verbs of actions that involve specifically lips, a shoulder, and knees were three more kinds of verbs used.

49.3.1 The Acquired Verbs of Actions with Manner Distinctions

Physical action verbs are characterized by encoding manner distinctions in the verb roots. Most of the children's acquired verbs that distinguish action manners can be

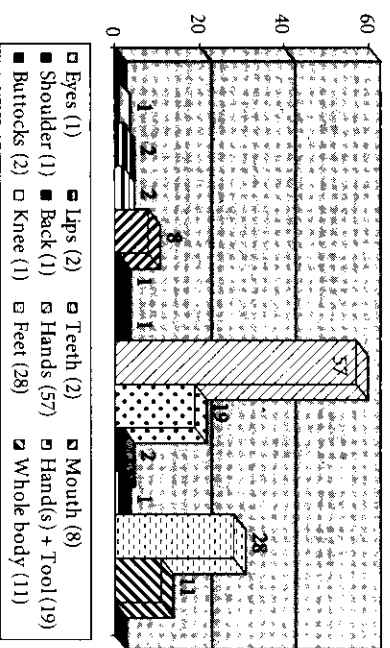


FIGURE 49.1 Children's production of physical action verbs classified based on body-part involvement

identified in terms of degrees of force executed, speeds, and motion direction of the actions. With the force distinctions, some of the verbs used indicate that the actions were completed with the force being applied gently (e.g., *pāi, rǒu, lǎo, dié, bāi, kē, wò, fú*), others with the force being applied to a moderate degree (e.g., *bāi, bān, bāo, chā, pèng, xī, rēng, zhuā*), and others still with the force being applied vigorously (e.g., *shuāi, yáo, tuō, là, zòn, tuī*). The action speed specifying the features of the verbs learned vary from slow (e.g., *tuō, là, fú, pǎ*) and moderate (e.g., *gǔn, bāo, bǎng, bāi, shuā*) to fast (e.g., *shuāi, rēng, dǎ, tiào, bèng, tī, dèng, zòn*).

The motion directions of the hand actions include the trajectories of downward, upward, forward, horizontally back and forth, vertically up and down, and sophisticated actions with multidirectional motions, such as *sǎ, shuāi, guà, chā, jǎng, yáo, rēng, bǎ, zhāi*. The Chinese specific verbs with an indication of motion of the feet and action manner of other body parts, such as *bei, bao*, and *káng*, were found to have been used by the children in the contexts of asking their parents to carry them or describing their own carrying actions.

Hand actions involving tools are another kind of distinctive manner. The children were found to have learned to express their own hand actions involving tools with the verbs that specify the tools, such as comb (*shū*), scissors (*jiǎn*), knife (*qiē*), crayon (*huà*), toy repair tool (*xiū*), toy shovel (*wǎ*), spoon (*chī, wèi*), piano (*tǎn*), broom (*sǎo*), rope (*bǎng*), and pencil (*xiě*). These learned verbs indicate that the children's conceptualized knowledge of the verb meanings is acquired with the support of their own experience of using the tools in the events in which the verbs are generally used.

The foot-action verbs (some traditionally termed "directional verbs") that specify motion directions used in a "serial verb construction" (Chao 1968; Wang 1973), as shown in the following, were all found to have been used by the children before the age of two. This shows that the children's activities by this age were diverse enough to experience all kinds of motions with directions.

| | |
|----------------------------|-------------------------|
| <i>chūlái</i> 'come out' | <i>jìnlái</i> 'come in' |
| <i>chūqù</i> 'go out' | <i>jìnqù</i> 'go in' |
| <i>guāilái</i> 'come over' | <i>qīlái</i> 'get up' |
| <i>guòqù</i> 'go over' | <i>shàngqù</i> 'go up' |
| <i>huīlái</i> 'come back' | <i>shàngqù</i> 'go up' |
| <i>huìqù</i> 'go back' | <i>xiàlái</i> 'go down' |
| | <i>xiàqù</i> 'go down' |

49.3.2 More Physical Flexibilities, More Near-Synonymous Action Verbs Acquired

When children were close to two years of age their physical development in strength and flexibility start to allow them to participate in many activities that involve physical actions of various kinds. They can keep their bodies balanced better when walking

or running. They have learned how to ride on swings, climb up stairs, and play on the seesaw and slide. Gradually they begin to try using their hands to play with more sophisticated toys such as building blocks and laying puzzles. They also begin to deliberately imitate and learn from adults how to carry out what parents do for them or for the family, such as putting on clothes and shoes, cleaning their faces, opening or closing doors, folding paper toys, cutting paper with scissors, and so on. All these activities involve physical flexibilities and coordination of various body parts. After having imitated enough and experienced the actions, children's perception and cognition for the understanding of human physical actions in relation to linguistic expressions are well achieved and conceptualized. This is the time that children start to produce further types of physical action verbs. Linguistically, categorically distinctive verbs that can be defined as near-synonyms become part of their lexicon. The ones acquired by the children as listed in the following are categorically manner-specific, and most of them are distinguished from each other only by subtle differences in the action manners.

| | | | |
|-----------|--------------------------------|-------------|---------------------------------|
| Biting: | <i>yào, kěn</i> | Kicking: | <i>tī, dēng</i> |
| Carrying: | <i>bào, káng, bei, nā, bān</i> | Picking: | <i>tiāo, zhāi</i> |
| Catching: | <i>jiǔ, zhuā, lāo</i> | Pouring: | <i>dào, chōng</i> |
| Wearing: | <i>dài, chuān, tào, tuō</i> | Pulling: | <i>tuō, lā, bá</i> |
| Cutting: | <i>jiǎn, qiē</i> | Putting: | <i>fàng, bái, gē, zhan, chá</i> |
| Drawing: | <i>huà, huà</i> | Rubbing: | <i>cuā, cā, mó, rǒu</i> |
| Hitting: | <i>dā, zǒu</i> | Scratching: | <i>zhuā, huá</i> |
| Holding: | <i>wò, ná, niē</i> | Throwing: | <i>shuāi, rēng, sǎ</i> |
| Jumping: | <i>tiào, bèng</i> | Touching: | <i>pèng, pāi, dòng, tán</i> |

Studies in bilingual children's lexical development and adult language learning state that one of the challenges in word learning is the learning of near-synonyms and that the ability in choosing an appropriate word among several and using it in the right context can be regarded as an indicator that the learner is at a higher level of learning (Gao and Ouyang 2009; Gao and Wang 2012). Thus the findings in this study suggests that the children were at a peak of lexical development and that there was a strong correlation between the speed of gaining language competence and the learning environment. Moreover, the different types of the acquired near-synonyms may also reveal more about how nonlinguistic knowledge gained by the children in daily activities supports particular aspects of child language learning. After all, the learning of physical action verbs is not the simple learning of lexical words per se.

49.3.3 Senses, Interpretations, and Intentions

In all the recordings, the adults' utterances to their children transmitting the same messages were found to be repeatedly rephrased as the adults were trying to elicit more word productions from their children. The adults' repetition of the action verbs was often

accompanied by their own physical demonstrations of the actions as well as their verbal descriptions of the causal effects of the actions, such as people's feelings of pain and happiness, etc. This feedback played an important role in helping the children connect their physical experiences to the meanings of the verbs and at the same time learn to infer, for instance, in what situation and to what persons certain actions are proper or not.

With regard to the relation between the children's physical activities and the learning of word senses, *dǎ* used by the children is a typical example of how they acquired lexical meanings in their daily activities. *Dǎ* is a polysemous verb with its senses extended far beyond its prototypical meaning of hitting with a bare hand. The children's uses of the verb fall into seven different semantic categories that can be specified as hitting a ball in game playing (e.g., *dǎqiú*); hitting actions performed with tools (e.g., *dǎqì, dǎ diànhuà, dǎ zhēn*); destroying something by hitting (e.g., *dǎ sǐ*); and hitting someone to give physical pain (e.g., *dǎ téng*); to show a strong dislike (e.g., *dǎ guǎn*); to give a physical attack in self-defense (e.g., *dǎ nǐ*), and to give physical punishment (e.g., *dǎ pīpì, dǎ pīgu, āidǎ, yào dǎ, dǎ nǐ*).

Among the seven senses of *dǎ* used by the children, the sense of giving physical punishment was used by most of them (seven out of ten) in the first-time recordings and by all ten children in the rest of the recordings. Its frequency was the highest of all. The different senses, various interpretations, and highly frequent uses of such a single verb acquired by the children at this young age indicate that they understand well physical action intentions as well as the socially expected interpretations of the responses. Besides, parents' verbal and physical behaviors influence their children's learning of lexical meanings.

49.4 DISCUSSION

The findings of this study support the hypotheses that there is a correlation between the Chinese domain-specific verbs that the children learn and the nonlinguistic factors that affect the children's understanding of the effects and intentions of physical actions. The semantic types of the physical action verbs that the children used include the top-ranked polysemous verb *dǎ* 'hit/beat', whose seven different senses were used by them in various contexts. Eighteen pairs or groups of physical action verbs were found and identified as near-synonyms. Syntactically, the Chinese-specific serial verb constructions were common in the children's uses of the physical action verbs to specify motion directions and causative action results.

The nonlinguistic factors include the children's physical capabilities in participating in the physical activities that involve actions of various body parts; their cognitive abilities in perceiving action manners and causal effects, such as degrees of force, motion, speed, motion direction, and so on; and their social and cultural understandings of the implications and intentions of the verbs used in different contexts. The physical experiences by which the children came to know what a physical action verb depicts and what

causal effect it may have seemed to be part of the preconditions for their learning of physical action verbs. In other words, children's cognitive understanding of the physical action verbs and their physical capability in participating in the action events help them learn the corresponding lexical terms. Besides, the number of the verbs and the ordering of the senses acquired seem to suggest that their physical and cognitive developments are parallel to their social and cultural developments.

Cross-linguistic studies provide evidence of children's ability to learn about particular actions and to structure the action categories (Slobin 1981; Chang and Maia 2001; Piaget 2002). Such extralinguistic knowledge can facilitate children's lexical categorization of new words. For instance, the verbs acquired by the children can be categorically defined both in terms of the types of body-part involvement and the linguistic features of the verbs. The types and features are also correlated with the learning order, the action manners, and the types of the children's daily activities; the more specifically the verb refers to an action that involves a single part of the body and that is common in children's daily activities, the higher tendency that children learn its sense first. This accords with the findings of other recent studies on children's lexical development (Maouene et al. 2011; Gao and Wang 2012).

In relation to manner distinctions, other studies reported that words that are manner-specific in meaning tend to be more easily acquired (Imai et al. 2002, 2005; Buresh et al. 2006; Tardif 2006; Pulverman et al. 2006; Chan et al. 2011) and words that are highly imaginable were found easy for children to learn (Ma et al. 2009; McDonough et al. 2011; Wang and Gao 2012). Possibly for similar reasons, the children in this study were found to have learned most of the commonly used physical action verbs that are both manner-specific and manner-imaginable. Moreover, they used the verbs not only to express the manner-distinctive actions but also how the effects they felt.

The social and cultural environment influences children's development in general. This study shows that the children's learning order of the verb senses was particularly influenced. The fact that 90% of the verb *dá* used by children means physical punishment is a good example. One may ask the question: Why do Chinese-speaking children learn this particular sense of *dá* at such an early age? First, we need to know that *dá* is the simplified term of *dǎ pīgu* 'spank', which is often used by Chinese parents on their children. The utterance of *dá pīgu* is generally merely a warning to their misbehaving children, though real spanking may not follow the verbal warning, as was the case found in quite a number of parents' utterances in this study: "Spare the rod and spoil the child." Culture may be defined as what a society does and thinks (Sapir 1921; cf. Lee 1996). The view that children will flourish only if disciplined and that physical punishment for any wrongdoing is necessary seems to be rooted in Chinese parents' thinking. As a self-defense and an imitation of parents' behavior, children learn the meaning of the verb with a clear understanding of its implications.

From the sociolinguistic perspective, the children's usage of *dá* support the assumption that children's conceptualization of word senses for the learning of physical action verbs are based on their cognitive understanding of human physical actions as well as the implications of human actions in a social context. They are both good indicators of

people's norms in a society. A good case in point is Gao's (2001) comparative study of the Swedish children's uses of the Swedish verb *slå* 'beat' and the Chinese children's uses of its Chinese equivalent verb *dá*. A striking difference found was that the Swedish children used *slå* only to refer to accidental actions with an inanimate agent as the subject (e.g., "the ball hit me"), while the Chinese children at about the same age used *dá* only to mean human intentional actions mainly for physical punishment. According to the UN Committee on the Rights of the Child, physical punishment of children was officially banned in China in 1949, almost ten years earlier than in Sweden (1958). Yet the use of the verb as a verbal reference to the physical punishment in Sweden has disappeared while the practice in China has obviously been going on to the present day. This shows that children's language is a reflection of the social and cultural environment they live in, and the trajectory of language development is shaped by both linguistic and extralinguistic environments (Tomassello 2003; Gao and Zelazo 2008).

In sum, the study introduced in this chapter shows that the Chinese-speaking children around two years of age were learning and using physical action verbs actively. Their production reveals interesting characteristics of domain-specific lexical development and their acquisition of the various kinds of extralinguistic knowledge. The findings can contribute to the future studies of children's language development in relation to their cognitive, social, and cultural developments.

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APPENDIX

CHINESE-SPEAKING CHILDREN'S PRODUCTION OF PHYSICAL ACTION VERBS

| Children's Production | Age | Children's Production | Age |
|-----------------------|-------|------------------------|-------|
| 看 kàn 'look' | 1;9-3 | 挤 jǐ 'squeeze' | 2;1-4 |
| 咬 yǎo 'bite' | | 剥 bāo 'peel' | |
| 吃 chī 'eat' | | 撒 sā 'drop' | |
| 叫 jiào 'call' | | 动 dòng 'touch' | |
| 打 dǎ 'spank' | | 刷 shuā 'brush (teeth)' | |

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CHAPTER 50

SEMANTIC PROCESSING

Access, Ambiguity, and Metaphor

KATHLEEN AHRENS

50.1 INTRODUCTION

SEMANTIC processing studies in Mandarin Chinese have been conducted since the late 1990s and demonstrate that when experiments focus on ongoing processing of meaning, the findings are in line with what would be expected (or has been found) in English. That is, there is no evidence that semantic processing of Mandarin Chinese is special because it is done in Chinese. Of course, in experiments designed to examine special properties of Chinese characters, especially those involved in the early stage of word identification, differences can be found (see Perfetti et al. 2007 for further discussion on issues related to reading in Chinese). But even though it has been hypothesized in the literature that Chinese may be processed differently than English for syntactic (Huang 1984) or discourse reasons (Bates et al. 1982, 1999; Ahrens 1998), the data gathered from online reaction time studies on lexical access, lexical ambiguity resolution, or conceptual metaphor processing have not supported this hypothesis.

50.2 THEORY CONSTRUCTION
AND METHODOLOGY

Construction of a psycholinguistic theory of sense processing, including construction of a cognitive model to explain conventional and novel metaphor use and processing, involves psycholinguistics tasks that tap both into reflective processes (i.e., offline tasks) as well as immediate and automatic language processing (i.e., online reaction-time tasks). Offline experiments refer to experiments in which participants are given written

questionnaires. In offline data collection, the time it takes for participants to complete the questionnaire is not measured. In online experiments, the participant sits in front of the computer and responds to stimuli presented on the computer screen. These are called reaction-time experiments because they are based on the amount of time it takes the participant to react to the stimuli on the screen by means of pressing a key or activating a voice-response key. Of course, many other types of experiments can be used in psycholinguistic studies as well. For example, researchers can look at the blood flow in the brain in response to linguistic stimuli, as in fMRI studies. They can also track eye movements, or the time course of event-related potentials (ERPs), which are averaged EEG signals after a particular stimuli (in this case, linguistic) has been seen or heard by a participant. Each type of study has its own advantages and disadvantages, and oftentimes mixed findings in the literature are due to the fact that the inherent constraints in one type of experiment involve substantially different language-processing mechanisms than another type of experiment. Moreover, even within the same type of experiment, slight differences in the timing of the visual presentation of stimuli or in the way the subjects are asked to respond can often lead to very different results. In addition, not all linguistic stimuli are created equal. Researchers often define what they mean by metaphor or meaning differently from one another. Thus, because linguistic stimuli may differ in terms of type, conflicting conclusions are sometimes found.

50.3 LEXICAL REPRESENTATION
AND ACCESS

For example, for many years there has been a debate in the psycholinguistic literature as to how lexical meaning is represented and accessed. One possibility is that the representation of lexical meaning can be considered to be stored in different nodes—one node for each meaning. In a random access model, a greater number of nodes would lead to quicker lexical access because it is easier to locate the meaning of the word that has more, rather than fewer, nodes. But under a competition model, the same type of representation would lead to a slowdown (or inhibition) in lexical access, because the greater number of nodes would compete with each other. Another type of model posits its lexical representation in the form of a listing of meanings from greater frequency to lesser frequency. This type of model constrains the access of meaning to occur in serial order, from most frequent to least frequent or least frequent to most frequent. The findings from experiments in English have had mixed results—some researchers found that the more meanings the word had, the quicker the word was responded to in online lexical decision tasks. But others found that words with more meanings had a slower access time (for an overview of the related literature, see Lin and Ahrens 2010). One reason for the differences in findings were related to the fact that the researchers defined number of meanings and calculated numbers of meanings differently. Some researchers used the

number of meanings in the dictionary, while others looked at the total number of meanings that speakers of the language provided in an offline task. Others collected only the first meaning the participants thought of and then calculated how many first meanings there were for each word under study. In addition, the calculation of meanings was often difficult to do with researchers struggling to make distinctions between words that have polysemous (related) or homonymous (unrelated) meanings. Lin and Ahrens (2010) approached the issue of lexical representation and access of nouns in Mandarin Chinese by following a computational framework of lexical semantic representation (Ahrens et al. 1998), which distinguishes between two levels of meaning, as in (1):

(1) A word's senses have the following characteristics:

- a. a sense is not an instance of metonymic or meronymic extension but may be an instance of metaphorical extension;
- b. the extension links between two senses cannot be inherited by a class of nouns;
- c. senses cannot appear in the same context (unless the complexity is triggered).

Meaning facets have the following properties:

- a. meaning facets are instances of metonymic or meronymic extension;
 - b. nouns of the same semantic classes will have similar extension links to related meaning facets;
 - c. a meaning facet can appear in the same context as other meaning facets
- (Lin and Ahrens 2010:4).

In this model, meanings are distinct senses if they occur in or are involved in different conceptual domains. For example, *huo guo* in (2) has two senses in Chinese—the first sense is a cooking pot and the second sense refers to a blocked shot in basketball games. The first sense, that of a cooking pot, has two meaning facets. The first meaning facet is a physical object itself, and the second meaning facet is the food that is contained in the object, such as soup.

(2) *huo guo* 火锅

Sense₁: a pot, used as a container above the fire when cooking

- Meaning facet₁: physical object: hot pot, the container
- Meaning facet₂: the food contained (e.g., soup)

Sense₂: a blocked shot, a term in basketball games (Lin and Ahrens 2010:4)

With these criteria in hand, a questionnaire was then designed to collect word meanings from participants who were native speakers of Mandarin Chinese. They were asked to write down as many meanings they could think of for each word and provide a sentence for each meaning they generated. Then raters independently decided if the meaning each participant gave was a sense or a meaning facet.

Based on these findings, the experimenters divided the words into two groups: words with only one sense and words with three or more senses. After controlling for the degree of familiarity with these words, the participants were then asked to make lexical decisions on words as they flashed on the computer screen. Making a lexical decision means looking at the words of the screen and deciding if the word has a meaning. For example, in English, words are made up of a string of letters. Experiments have shown that non-words that rely on orthographical features, such as XLPQ, do not ensure that participants access their lexical semantic knowledge when they are making button-press decisions to words and non-words flashing on the screen. They can simply make decisions based on the visual information provided. However, using a type of pronounceable but legal non-word, known as pseudohomophones, (i.e., words such as BERD or TABLE), requires participants to access their semantic knowledge about both the words and the non-words that they are viewing in the experiment. In Chinese, pseudohomophones are created by using two legal characters that do not make up a word when they occur together but instead sound like they do. For example, 剩立 is not a real word in Chinese (though the characters 剩 and 立 both exist): its pronunciation *sheng-li* is the same as 胜利, which means 'victory' (Lin and Ahrens 2010:7).

The task for participants was to decide if the visual target that flashed on the computer screen—either a word or a pseudohomophone—was a word or not. This visual target was displayed on the screen for 2,000 milliseconds (ms) or until a participant responded, and then there was an interval of 1,500 ms before the next trial began. The findings showed that the response times were significantly faster to words with multiple senses as compared to words with only one sense. This is not what a serial model or a competition model would predict. But a probability-based model of random lexical access—whereby words with multiple senses have a greater number of semantic nodes randomly distributed across semantic space—would predict such a finding. Of course, at a certain point in time, sense selection needs to take place, so that the ambiguity can be resolved and the language processor can continue to take in and comprehend additional information.

50.4 LEXICAL AMBIGUITY RESOLUTION

In the preceding section, the representation and access of lexical meaning was examined in the absence of linguistic context. However, in most situations, people encounter and resolve which sense of the word is being used in ongoing context without even knowing that they are doing so. (One exception, of course, is puns.) The question then arises as to whether all senses of a word are accessed in context or only the contextually appropriate sense is accessed. If all senses of a word are accessed in context, at some point the appropriate sense must be selected—usually without the listener noticing that an ambiguity has been accessed and resolved. This line of questioning has been extensively researched in a variety of languages, including English, Italian, Cantonese, and Mandarin Chinese. One reason for this extensive research has to do with the fact that

this question relates directly to hypotheses regarding cognitive processing in general, including the Modularity Hypothesis and the Interactive Activation Framework.

According to the Modularity Hypothesis, all senses of ambiguity are accessed regardless of the preceding sentential context (Fodor 1983). This hypothesis postulates that processing in any given module of the language processor (such as the lexical-level module) occurs independently of the processing that occurs in any other module (such as the discourse-level module) when language is being processed at natural speeds and under relatively natural conditions. The Interactive Activation Framework, on the other hand, postulates that information can pass between modules at any time, and thus it is possible for context to influence lexical access (McClelland and Rumelhart 1981; McClelland 1987). This framework hypothesizes that in a particular context, multiple senses are not accessed; only the contextually appropriate sense is accessed. A variation on this model is known as the reordered access model, which postulates that the primary and secondary senses are activated when the sentential bias is toward the secondary meaning, but only the primary sense is activated when the sentential bias is toward the primary meaning. That is, once the primary sense is accessed, there is no reason to access the secondary sense unless the contextual bias requires it.

Many lexical ambiguity resolution experiments involve participants listening to a complete sentence over headphones and seeing a visual target at some point in the middle of the sentence, in order to avoid wrap-up effects. When participants see the visual target, they may be asked to name it or to make a lexical decision—that is, to decide if it is a word or not a word. The visual target is synchronized to appear at the point in the sentence where the lexical ambiguity has occurred. This visual target may either be a word related to one of the senses of the auditory ambiguity or a matched control word, or it may be a word related to the secondary sense of the auditory ambiguity or a matched control word. The idea is that if both senses of the auditory ambiguity are active, then a word related to either the primary sense or the secondary sense will be faster than when the participants make a lexical decision to words in the respective control condition (Swinney 1979; Onifer and Swinney 1981).

The findings in the literature have been mixed in terms of which model is supported by the data, but an analysis of these findings demonstrate that if the visual target is presented for less than 1,000 ms and is presented no later than the offset of the ambiguous word, then both the primary and the secondary meanings are activated as compared with their control conditions. However, if the visual target is presented for 1,500 ms or longer, then only the contextually appropriate sense of the ambiguous word is activated compared to the control conditions. Extensive research has been done in both English (Swinney 1979; Tanenhaus et al. 1979; Onifer and Swinney 1981; Swinney and Love 1996; Swinney et al. 2000; Nicol et al. 2006) and Mandarin Chinese (Ahrens 1998, 2001, 2002, 2006) to support these findings, while research in Italian has looked only at visual target presentation times of 1,500 ms (Tabossi et al. 1987; Tabossi 1988; Tabossi and Zardoni 1993). Moreover, the research in Cantonese used either sentence-final ambiguities or experiments with sentence-final ambiguities (Li et al. 2002; Yip 2008) that are not preferred in testing modularity claims because they involve wrap-up effects whereby the listener attempts to process

the entire meaning of the sentence, which does not reflect access in ongoing processing. In addition, a different type of cross-modal task, known as a cross-modal gating task (Li and Yip 1998), was also used in a separate study in Cantonese. In this study, participants heard sentences up to the point of the ambiguous word and then heard only a portion of the ambiguity. Although Li and Yip (1998) concluded that context plays an important role in the processing of ambiguity in Cantonese because the gated word was able to be ascertained with less than half the acoustic phonetic information, it is probable that the processor was dealing with the oncoming information in a very different manner, as the participants were being asked to guess instead of automatically processing the ambiguity.

In short, what is critical in experiments on lexical ambiguity resolution is to ensure that the spoken language is able to be processed by the listeners immediately and automatically in ongoing speech as is done in everyday language comprehension. Experiments in all languages that meet these criteria have found support for all meanings to be accessed at the point of lexical access, and then at a later stage, after lexical access has occurred, the ambiguity is resolved.

50.5 CONSTRUCTION OF A COGNITIVE MODEL TO EXPLAIN CONCEPTUAL AND NOVEL METAPHOR PROCESSING

A natural extension from the question of sense processing involves the issue of how metaphorical senses are processed and if there is a difference between how conventionalized metaphorical senses are processed and how novel metaphorical senses are processed. Conceptual Metaphor Theory postulates that metaphors are a cognitive phenomenon (Lakoff and Johnson 1980; Lakoff 1993; Lakoff and Johnson 1999). They are instantiated in language, but they have conceptual underpinnings. Conceptual metaphors link two conceptual domains: a source domain and a target domain. A conceptual domain is a set of entities, qualities, and functions that are semantically linked. The source domain usually consists of a concrete concept, such as BUILDING, while the target domain involves an abstract concept, such as IDEA. By convention, conceptual metaphors are written in small capitals in the form of X IS (A) Y, where X stands for the target domain and Y stands for the source domain, as in IDEA IS A BUILDING.

Conceptual Metaphor Theory postulates that the source domain is used to understand a target domain. For example, when people want to talk about TIME, they can use the source domain of MONEY to do so (i.e., TIME IS MONEY), as in (3):

(3) *Ba shi-qing zuo hao, xu-yao hua yi-dian shi-jian*

BA something do well, need spend one-little time

'In order to do something well, one needs to spend a bit of time on it.'

In this case, the concrete concept of spending (money) is applied in the abstract domain of time, with the associated implication that time is a finite resource that can be used up.

Conceptual Metaphor Theory proponents propose that conventionalized conceptual metaphors such as those in example (3) are processed as quickly as literal language. In addition, one particular model within the Conceptual Metaphor Theory, the Conceptual Mapping Model, proposes that there is an underlying reason why a particular target domain selects a particular source domain (Ahrens 2010). This underlying reason is stated in terms of a mapping principle. An alternate proposal, known as the Attribute Categorization View, instead argues that there are no preexisting correspondences between two conceptual domains, and thus there is no reason why a particular target domain co-occurs or selects a particular source domain (i.e., Glucksberg et al. 1997; McGlone 1996; Keysar et al. 2000). Instead, when a metaphor occurs, the source domain provides properties that are attributed to the target domain. That is, metaphor is understood on-the-fly and is not part of a systematic mapping. These two accounts can be distinguished by the fact that they make different predictions about the processing of conventional and novel metaphors.

The issue of which account is better supported by the data can be considered on two levels: at the level of sentence processing and at the level of paragraph processing.

In terms of sentence processing, the Conceptual Mapping Model predicts that conventional conceptual metaphors (i.e., metaphors that follow the mapping principle and are frequently used in the language) will be treated the same as literal language—they will be equally acceptable and read equally quickly. Next, metaphors that follow the mapping principle but are novel usages will receive slightly lower acceptability ratings and slightly longer reading times. Last, novel metaphors that do not follow the mapping principle will involve even lower acceptability ratings and even longer reading times. These predictions have held in online and offline experiments, which indicate that the mapping principles are psychologically valid (Ahrens 2010). An fMRI study on conceptual and novel metaphors shows that conventional metaphors recruit only a small amount of right hemisphere resources, while very novel metaphors recruit a frontal and temporal region bilaterally (Ahrens et al. 2007), again demonstrating that there is a difference in how novel metaphors and conventional metaphors are processed. In addition, while many researchers have argued that conceptual metaphors are not accessed and understood online, Gong and Ahrens (2007) demonstrate that the visual presentation in paragraph form allows for online integration and access of conceptual metaphors, while line-by-line presentations set up expectations for new information, inhibiting conceptual metaphor access.

All these studies point to a model that processing conventionalized conceptual metaphors is based on a systematic set of mappings and occurs as quickly as the processing of literal language, while novel metaphors require additional processing resources and take more time to process. These findings are expected in a Conceptual Mapping Model, as it distinguishes not only between conventionalized and novel metaphors but also between different types of novel metaphors, while the Attribute Categorization Hypothesis emphasizes the nonsystematicity involved in metaphor comprehension.

50.6 BEYOND SEMANTICS

The studies discussed here focus solely on semantic processing. But there are also studies that look at the interaction between syntax and semantics. For example, a recent ERP study by Zhang et al. (2010) found that it was not necessary for a syntactic structure to be built before the word was semantically integrated into the ongoing sentence. Zheng et al. (2006) ran an ERP study on Chinese *ba* sentences that varied in terms of whether they were semantically or syntactically incorrect and argued that syntactic processes are dealt with earlier than semantic processes but that in the early processing phase they are distinct and only interact later. Zhou et al. (2010) also conducted an ERP study that looked at the mismatch between classifiers and nouns and verbs and nouns (among other conditions) and again argued that the data provided evidence that semantic and syntactic processing is progressing in parallel at the earliest stages, with neither processing having a temporal advantage; Yu and Zhang's (2008) similar type of study had comparable findings. These studies, along with those that deal primarily with syntactic processing such as Yap et al. (2009) and Yang et al. (2010), use characteristics of the Chinese language in creating linguistic stimuli to tease apart processing issues that cannot be dealt with in English due to confounding factors inherent in the language. However, no psycholinguistic studies—outside of those done specifically on understanding processes related to reading—have found that Chinese speakers have unique syntactic or semantic processing mechanisms in ongoing language comprehension; instead the findings to date suggest that Chinese-speakers are dealing with semantic and syntactic processes in ways that are similar to those of English-speakers. Whether future methodological advances into the neural processes of language comprehension will find a different result remains to be seen in the coming decades; the key issue as always is for researchers to understand how subtle differences in task, timing, and linguistic stimuli may affect their results as they seek to further unravel the mysteries of language processing.

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CHAPTER 51

NEUROCOMPUTATIONAL
APPROACHES TO CHINESE

PING LI

51.1 INTRODUCTION

A large body of knowledge has accumulated on the computational and neural mechanisms underlying language acquisition, representation, and processing. Much of this knowledge until recently, however, has come from studies of Indo-European languages. Recent interest in Chinese has shed new light on the understanding of how language-specific experiences help shape the neural and computational systems of language. Chinese provides a particularly important test ground for neurolinguistic and neurocomputational theories. The use of a distinct, nonalphabetic system in writing, the distinction of lexical tones for monosyllables, the lack of inflectional grammatical morphology, and the fluidity of lexical categories are among the few special features of Chinese that researchers have explored in the past decades (see Li et al. 2006 for review chapters on some of these topics).

Recent excitement associated with the study of Chinese has also come from research using computational and neuroimaging tools. In particular, neurally inspired computational models, such as connectionist models, offer researchers a glimpse of the internal processes of learning, representation, and processing of language (MacWhinney and Li 2008; Li and Zhao 2012). At the same time, neuroimaging methods, such as functional magnetic resonance imaging (fMRI) and event-related potentials (ERP), have provided tools that allow investigators to see the brain's hemodynamic or electrophysiological responses *in vivo* as the brain performs language tasks (e.g., listening, speaking, and speech learning). These exciting developments in theoretical as well as methodological fronts have allowed for new perspectives to emerge in the study of the Chinese language, and scholars with access to computational and neuroimaging tools have rigorously attempted to understand the computational and neural mechanisms underlying the learning, representation, and processing of Chinese.

51.2 THE ACQUISITION OF LITERACY

The Chinese characters are uniquely shaped and structured in serving its linguistic functions, distinctly from other scripts and orthographic forms of other languages (e.g., alphabets). There has been also a large literature dedicated to the study of the neurocognition of Chinese reading (Tan and Sioh 2006; Perfetti et al. 2007). This literature, however, has clearly shown that reading in Chinese is different from reading in alphabetic languages and that there may not be a universal mechanism underlying reading processes for all languages. For example, Tan et al. (2001), using the fMRI method, have shown that the middle frontal regions in the left hemisphere are highly important for the recognition and learning of Chinese characters. According to these authors, this area is specialized for handling visuospatial analysis and remembering complex visual patterns, and given that reading in Chinese but not English relies heavily on visuospatial analysis, this brain region represents a "Chinese reading center." Sioh et al. (2004) further demonstrated that in contrast to children suffering from dyslexia in alphabetic languages, children who are dyslexic in Chinese show a lack of brain activities in this brain region during reading. Thus the disruption of the middle frontal regions in Chinese dyslexics, instead of the disruption of other brain regions important for alphabetic languages, is strong evidence against the hypothesis that there is a universal neural basis of reading and reading acquisition.

A number of studies have also used computational methods to investigate Chinese children's acquisition of characters. There has been a wealth of knowledge gained from experimental and corpus studies of how Chinese children learn characters (Shu et al. 2000), but there have been only a few computational models that are developed specifically for Chinese character processing (e.g., Yang et al. 2009). Xing et al. (2004) used a connectionist model to simulate Chinese character acquisition by school-aged children, based on the School Chinese Corpus extracted from elementary-school textbooks used in Beijing (Shu et al. 2003). Xing et al. built a self-organizing connectionist model to learn the most frequent 300 Chinese characters present in the School Chinese Corpus in Grades 1, 3, and 5 (Mäkkäläinen 1997; Li et al. 2004). The learning of the model progressed by pairing/training the orthographic representations of these characters in one network with their phonological representations in the other. Once the training was completed, the model was tested with novel words for character naming, and the testing words varied in their frequency, regularity, and consistency.

The simulation results of Xing et al. (2004) showed that the model was able to learn the structural properties of the Chinese characters, such that similarly shaped characters are grouped together by the network. In addition, the model showed an important interaction between character regularity and frequency: regularity effects were more pronounced for low-frequency characters and novel characters than for high-frequency characters, consistent with previous empirical findings. Xing et al.'s model further showed that naming errors produced by the model had a developmental profile: for

learning at Grade 2, the network tended to read novel characters as totally irrelevant characters, but at Grades 4 and 6, it read the character in the pronunciation of its phonetic part or as another character having a similar phonetic part. Xing et al.'s model not only matched up with what we know from empirical studies of children learning Chinese but also allowed the researchers to systematically vary the composition of the target characters with regard to the linguistic properties such as regularity and frequency of characters.

5.1.3 THE ACQUISITION OF LEXICAL CATEGORIES

One area in which computational modeling is particularly informative relates to the use of identical simulation parameters in two different models that take input from two different languages, respectively. This can be compared to a situation in which the twin brothers or sisters are learning different languages, given the same genetic makeup. Zhao and Li (2008) constructed a model to do just that. Assuming that Chinese and English are significantly different, the learner must pick up different input characteristics when learning one or the other language.

In the child language literature, there is an intense debate on the role of input in the acquisition process (see Goodman et al. 2008). There is also a debate with regard to whether input differences drive the different patterns observed in children's language, especially with regard to the ratio of words in different lexical categories (e.g., nouns versus verbs in early child lexicon). For example, English-speaking children's early lexical repertoire shows a clear "noun bias" (Gentner 1982), a dominance in the number of nouns compared to verbs and other categories of words. This noun bias is found to be weak or nonexistent in other languages, particularly in Chinese and Korean (Tardif 2006; but see a recent study by Hao et al. 2014). Zhao and Li (2008) applied the DevLex-II model to examine cross-linguistic similarities and differences in the development of early lexicon and investigated how specific characteristics of the linguistic input can affect the developmental time course (see Li et al. 2007 for a description of the DevLex-II model).

The simulation results are presented in Figure 51.1. The figure shows different trajectories in the acquisition of lexical categories such as nouns, verbs, and adjectives. Using identical simulation parameters, the model derived different patterns in vocabulary growth, which is strong evidence for the hypothesis that the learning outcomes must be due to characteristics of the input to the model.

Comparing 51.1(a) and 51.1(b) we can first see that the network generally produced more nouns in English than in Chinese, and more verbs in Chinese than in English, across the early stages. For Chinese, it produced comparable numbers of nouns and verbs at the early vocabulary stages. Proportions of nouns increased more dramatically

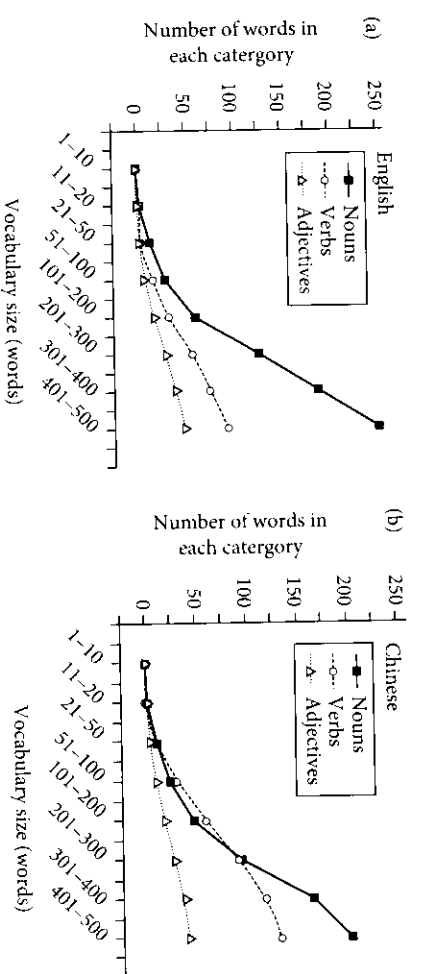


FIGURE 51.1 Early vocabulary development of nouns, verbs, and adjectives in the DevLex-II model (from Zhao and Li 2008)

only after 300 words had been learned. By contrast, in English, nouns always dominated over verbs in number, starting from the very earliest stages. Moreover, the rate of increase for nouns was also more rapid than that for verbs in English. In general, the model displayed a much stronger noun bias in English than in Chinese, consistent with empirical evidence on cross-linguistic differences in vocabulary growth. Such differences between the two languages must be attributed to the input differences, given that the same learning parameters were used in the model. Additional analyses of the input to the model also suggested that linguistic variables such as word frequency and word length differed in the lexical categories of the two languages (e.g., Chinese verbs tend to be shorter than English verbs), which could also influence the ease or difficulty in the model's learning process (as well as for children).

51.4 THE REPRESENTATION OF LEXICAL CATEGORIES

While computational models have been very useful in allowing variables of interest to be flexibly manipulated for the study of language and reading development, as discussed previously, neuroimaging methods have provided cognitive scientists and language researchers with unprecedented power in investigating how language is represented and processed in the brain. These methods allow us to see the brain in action as language processing takes place in real time. In Section 51.2 we mentioned how the fMRI method has enabled researchers to discover important brain regions for reading Chinese. In this section we show that fMRI also enables the understanding of how lexical categories such as nouns and verbs are represented in the brains of monolingual Chinese speakers and Chinese-English bilinguals.

Functional MRI involves the use of strong magnetic fields created by the magnetic coils of the MRI machine to measure hemodynamic changes in blood flow, specifically the blood-oxygen-level-dependent (BOLD) signals (see Scott and Wise 2003 for a primer of the fMRI method). fMRI captures these dynamic BOLD activities in various parts of the brain, presumably reflecting underlying neuronal activities related to specific processes of cognition. In general, increased BOLD signals reflect increased cognitive activities, and by looking at changes of the BOLD signals in various parts of the brain in response to various visual or auditory stimuli, researchers can infer about the role that focused brain regions may play in specific tasks.

51.4.1 Lexical Representation in Monolingual Speakers

A hotly debated topic with regard to how linguistic categories are represented in the brain has been whether nouns and verbs are handled by different brain regions. Previous research based on studies of lexical representation in Indo-European languages has suggested that nouns tend to activate the posterior brain systems encompassing temporal-occipital regions while verbs activate prefrontal and frontal-temporal regions. However, recent evidence suggests that such distinctions are much less reliable as originally thought, and whether we can observe such distinctions depend on a number of variables such as the experimental paradigms and the linguistic properties of word stimuli used in the experiments (see Crepaldi et al. 2011; Vigliocco et al. 2011).

It is important to pursue the neural representation of nouns and verbs in Chinese for an interesting reason. Chinese linguists have long debated whether a clear-cut noun-verb distinction, or distinction between any lexical categories based on grammatical properties, can be observed. In Indo-European languages, nouns are marked for definiteness, case, gender, and number, whereas verbs are marked for tense, aspect, and number. These types of grammatical marking are largely absent in Chinese. In addition, many words in Chinese are class-ambiguous even if we may call them nouns, verbs, or such things (i.e., they are words having “dual membership” status, sometimes with slight meaning differences, such as *wēixiè* ‘threat’ or ‘threaten’). Some estimates have put dual-membership words at as high as 30% of the total number of monosyllabic and disyllabic nouns and verbs in Chinese (Hu 1996). If lexical categories are so fluid and category boundaries so blurred in Chinese (Kao 1990), will the Chinese brain represent nouns and verbs in distinct cortical regions as has been found in other languages?

Li et al. (2004) addressed this question in an fMRI study, in which native Chinese speakers from Beijing were asked to read lists of nouns, verbs, and dual-membership words while their functional brain images were collected. The results showed that unlike in English and other Indo-European languages, nouns, verbs, and dual-membership words in Chinese activated a wide range of overlapping brain areas similarly in frontal, temporal, and cerebellum areas, in both the left and the right hemisphere. The lack of any significant difference between nouns and verbs in the neural representation was

attributed to the influence from language-specific properties of Chinese. The findings are consistent with the hypothesis that language-specific properties of Chinese influence cognitive and neural representations of language and that neural representations develop as a result of experience with specific linguistic input. However, the authors were careful in saying that one should not make the reverse influence, that is, to use the lack of neural distinction of words in support of the argument that there is no lexical category such as nouns or verbs in Chinese.

51.4.2 Lexical Representation in Bilingual Speakers

If brain responses to nouns and verbs in Chinese reflect the language user’s experiences with language-specific properties of Chinese, how do speakers who have experience with both Chinese and English represent nouns and verbs in the bilingual brain? (See Grosjean and Li 2013 for reviews of bilingual neuroimaging research; Li and Green 2007 for neurocognitive studies of Asian languages; and Li et al. 2014 for a review of neuroplasticity due to bilingualism). Would nouns and verbs from two languages be represented and processed in the same way as in one language, or would they exhibit specific patterns of response according to the specific language?

Chan et al. (2008) examined lexical representation of nouns and verbs in bilingual speakers who grew up in Hong Kong. These bilingual speakers learned both Chinese and English from a young age and could be considered “early bilinguals” by any measure. In the study the bilingual participants were asked to read lists of nouns and verbs in Chinese and English while their brain images were acquired. The results showed that the bilinguals responded differently to nouns and verbs in the two languages: consistent with findings from monolingual Chinese speakers as reported in Li et al. (2004), when bilinguals were presented with nouns and verbs in Chinese (first language), they showed no significantly different patterns in brain activities for the two lexical categories; when presented with nouns and verbs in English (second language), however, their neural responses were significantly different, involving stronger brain activations in a set of motor and sensory areas for verbs than for nouns. These findings suggest that the early bilingual brain might be sensitive to language-specific properties of each target language, further confirming the hypothesis that neural patterns of activation may be modulated by specific linguistic experiences.

A recent follow-up study by Yang et al. (2011) further tested a group of late bilingual learners in Beijing who started to learn English only at around age twelve. The authors hypothesized that the differential neural patterns observed in Chan et al. (2008) might reflect the bilinguals’ long-term experiences with the two languages from an early age. Previous behavioral and imaging research has identified age of acquisition as a powerful predictor of second-language performance (Wartenburger et al. 2003; Hernandez and Li 2007). Yang et al. hypothesized that early bilinguals and late bilinguals may show different neural patterns in processing nouns and verbs because for late bilinguals their

first language interferes more strongly with their learning and representation of the second language (Hernandez et al. 2005; Zhao and Li 2010).

Yang et al.'s (2011) results confirmed this hypothesis: for Chinese, consistent with Chan et al.'s (2008) early bilinguals, the late bilinguals showed no neural differentiation of lexical categories between nouns and verbs; for English, however, in contrast to Chan et al., the late bilinguals also displayed no significant differentiation of nouns and verbs. When patterns of neural response to English were compared with those to Chinese, the only significant difference found was that enhanced responses were observed in a few regions for English than for Chinese, which likely reflects the more effortful processing of a second language as compared with the processing of a first language. Figure 51.2 presents a snapshot of the brain activations in the two languages and the direct-contrast images.

The lack of noun-verb imaging differences not only in Chinese but also in English may be accounted for by reference to the age of acquisition effect in light of Chan et al.'s (2008) findings. In other words, the late Chinese-English bilinguals in Yang et al.'s (2011) study may be applying the neural mechanism for native language (Chinese) to the processing of a late acquired second language (English). This is new evidence that language-specific experience not only shapes the neural representation of lexical categories in a first language but also that of a second language, depending on when the second language is acquired (and how proficient the second language may be). Together, these data indicate that the form of representation in the bilingual brain is weighted by properties of the particular target language and may have distinct underlying neural correlates for each language in question. When the key properties of the language in representation differ significantly, the neural systems involved may show greater differences as a result of the learner/speaker's interaction with the linguistic environment.

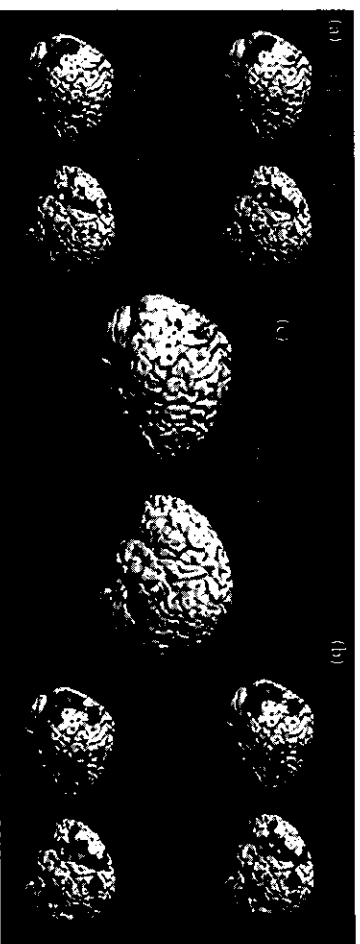


FIGURE 51.2 Surface 3D images showing averaged brain activities of bilingual participants that responded more strongly in the (a) Chinese and (b) English conditions. No significant differences were seen between nouns and verbs in either Chinese or English. (Reproduced with permission from Elsevier)

51.5 THE PROCESSING OF GRAMMATICAL MORPHOLOGY

These studies indicate that the language-specific properties of Chinese may have significant impact on the acquisition and representation of Chinese with regard to computational and neural mechanisms. One other striking aspect of the Chinese language, as discussed earlier, is that Chinese lacks inflectional morphology for grammatical categories. The lack of inflectional morphology in Chinese has led to a large body of previous research in attempts to understand the language-universal versus language-specific mechanisms, in both normally developing and brain-injured individuals (see reviews in Li et al. 2006). The unique properties of Chinese have important consequences on the cognitive processing of words and sentences in Chinese as compared with that in other languages, as previous research has amply demonstrated (e.g., Li et al. 1993, 2010). But what impact do language-specific properties of Chinese (e.g., lack of grammatical inflections) have on the learning of a second language with grammatical inflections?

English has only limited grammatical morphology in the marking of tense, aspect, and number, as compared with other Indo-European languages. But it does require subject-verb agreement with regard to number (singular vs. plural) in sentences such as *the key to the cabinet is lost* versus *the keys to the cabinet are lost*. In Chinese, such requirements are nonexistent. As such, the learning of subject-verb agreement has been a major challenge to Chinese speakers of English and other Indo-European languages.

In an effort to understand the neural correlates of grammatical processing in a second language, Chen et al. (2007) investigated subject-verb agreement in sentence comprehension by proficient Chinese-English bilinguals. They used ERP to measure the bilingual participants' electrophysiological responses. In contrast to fMRI (see Section 51.4), the ERP method measures, on a millisecond-by-millisecond basis, the brain's ongoing electrical activities (electroencephalograms or EEGs) rather than hemodynamic BOLD responses. When raw EEG signals are averaged and "time-locked" to stimulus events (e.g., presentation of a visual word), the corresponding ERPs that fluctuate in voltage can be extracted and analyzed. These fluctuations are designated as "components," the "brainwave peaks and valleys" (see Moltesse et al. 2001; Kutas et al. 2007 for reviews of the ERP method in language processing).

In Chen et al.'s (2007) study, bilingual Chinese-English participants as well as native English speakers listened to English sentences that were either grammatical (subject-verb agreement, e.g., *the price of the cars is too high*) or ungrammatical (subject-verb disagreement, e.g., **the price of the cars are too high*, which is ungrammatical in English, marked by the asterisk), and judged whether the sentences were correct according to English grammar. The results indicated distinct ERP response patterns for the bilinguals versus the native speakers. When the sentences were ungrammatical, native English speakers showed a typical ERP component called LAN that indicates early morpho-syntactic analysis, at around 300 to 400 milliseconds after seeing the critical word (the

verb), followed by another ERP component called P600, which indicates detection of morphosyntactic error, at around 600 to 800 milliseconds. By contrast, such ERP components were totally absent in the Chinese-English bilinguals' responses. Interestingly, the Chinese-English bilinguals, as did the native speakers, could detect the ungrammatical sentences in the behavioral part of the experiment, indicating that the bilinguals were indeed proficient in the second language. The fact that only brain responses as measured by ERPs showed group differences suggests that on the one hand, the electrophysiological measures are highly sensitive, and on the other, when processing syntactic features that are absent in one's native language, the learner may use neurocognitive mechanisms from the native language to process the second language, consistent with our fMRI data discussed earlier in Section 51.4.

51.6 CONCLUSION

In this chapter I discussed neural and computational studies of language acquisition, representation, and processing in Chinese monolingual speakers and Chinese-English bilingual speakers. I examined the acquisition of Chinese characters, the acquisition of lexical categories, the representation of lexical categories in both monolingual and bilingual speakers, and the processing of morphosyntactic agreement in native and second-language speakers. In selecting the discussion of each of these domains, I highlighted the language-specific properties of the Chinese language as compared with Indo-European languages, given that previous cognitive research in Chinese has clearly demonstrated that these specific properties in Chinese script, lexicon, and grammar significantly impact the language user's performance and behavior (see Li et al. 2006 for discussion). In addition, I have also attempted to discuss a number of methods, including computational models and neuroimaging methods such as fMRI and ERP, and show how these methods can benefit language scientists in the understanding of language-universal and language-specific patterns. Finally, the discussions in this chapter are consistent with a general hypothesis that the author has been advocating with many colleagues, that is, that the human brain is highly sensitive to language-specific properties, and the linguistic experience with Chinese, among other experiences, help to shape the neural structure and the neural patterns of response in the learning, representation, and processing of language (see Li et al., 2006; Li, 2014; Li et al., 2014).

It is clear from our discussion that the Chinese language provides researchers with unique opportunities to study the relationship between language, cognition, culture, and the brain. That may be the main reason why the past decade has seen a rapidly growing interest in the study of Chinese from neural and computational perspectives. At the same time, language scientists interested in Chinese should attempt on a larger scale to collaborate with psychologists, neuroscientists, and computer scientists to examine the neurocomputational mechanisms underlying the learning and processing of Chinese and other languages. This will require researchers to take a broad view of the modern

scientific enterprise and to embrace new technological developments. Unlike linguistics practiced in traditional ways, the modern study of language must rely on collaborative work in tackling complex problems such as how the brain supports the mind and how single and multiple languages are acquired by and housed in the same brain. Whether one will use a specific method or tool will of course depend on the specific research questions of interest, and it will be incumbent upon the researcher to assess the accessibility, flexibility, and other pros and cons associated with each methodology. This chapter hopefully provides some useful pointers toward a broader view of neurocomputational perspectives on Chinese and conveys the excitement of new research arenas to new students of the Chinese language.

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CHAPTER 52

DEVELOPMENTAL DYSLEXIA
IN CHINESECATHERINE MCBRIDE, XIUHONG TONG,
AND JIANHONG MO

The etiology and markers of developmental dyslexia in Chinese are of great practical and theoretical interest in part because these may differ somewhat from those of alphabetic orthographies. Whereas the hallmark of dyslexia in alphabetic orthographies is phonological processing, this is not as clear in Chinese, perhaps in part because the phonological cues for character or word recognition are relatively unreliable in Chinese. Rather, Chinese children with dyslexia often manifest particular difficulties with rapid automatized naming, morphological awareness, and visuo-orthographic processing. There is some evidence for difficulties in verbal-visual paired learning and copying skills in these children as well. Whether a phonological coding system is used routinely to teach Chinese in a given Chinese society (e.g., Mainland China or Taiwan vs. Hong Kong) is also important in understanding developmental dyslexia in Chinese. Collectively, these findings highlight the fact that, although all writing systems rely on a conversion from phonological to semantic (morphological) to orthographic representations for reading acquisition, the strengths of the semantic and orthographic representations are stronger and the phonological representations are weaker in Chinese, relative to other scripts. This reality requires that the definition, diagnosis, and treatment of developmental dyslexia in Chinese be multidimensional. Thus both linguistic and nonlinguistic skills must be incorporated in research on the development and impairment of reading acquisition in Chinese.

In the past twenty years or so, researchers have learned a lot about developmental dyslexia in Chinese. Conclusions depend in part on where this research is done, because most Chinese children make use of a phonological coding system as an aid to learning Chinese, whereas some, notably those in Hong Kong, do not. A phonological coding system (*Pinyin* 拼音 on the Mainland; *Zhuyin Fuhao* 注音符号 in Taiwan) likely mediates the process of learning to read Chinese to a certain extent. Nevertheless, at the same time, across Chinese societies, the correlates of dyslexia seem to be centered

less on phonological sensitivity, a hallmark of dyslexia in alphabetic orthographies (e.g., Goswami 2002; Share 2008) and more on skills that integrate visual-orthographic and semantic processes. There is widespread debate about the skills related to dyslexia in Chinese, however, beginning at the neuroscience level.

So far, only two neuroimaging studies have been conducted on Chinese developmental dyslexia (Hu et al. 2010; Siok et al. 2004), and, unfortunately, the two studies appear to hold different views about the neurological basis of Chinese developmental dyslexia. In 2004, Siok et al. used homophone judgment and character decision tasks to test the hypothesis that Chinese developmental dyslexics might differ from their Western counterparts in brain activation because of differences in the orthographies used. Results of the two tasks consistently showed that, as compared with the temporoparietal and occipitotemporal regions, which exhibited some limited functioning during the reading process by their Western counterparts, the left frontal middle gyrus (LPMG) was the brain area exhibiting abnormal patterns in Chinese children with developmental dyslexia as compared to those not manifesting dyslexia. The authors proposed two possibilities to explain the functions of the LPMG associated with Chinese character and word processing. First, the processing of Chinese characters requires integration of visual-orthographic, phonological, and semantic information; therefore, the LPMG may function as a means to coordinate and integrate information in processing Chinese characters and words. Second, the LPMG might be recruited to support the visual-motor activity that may play an important role in learning to read and write Chinese (Tan et al. 2005). Tan and colleagues, therefore, suggested that LPMG might be a neuroanatomical marker of Chinese reading disability.

In another fMRI study, however, Hu and colleagues (2010) reported that Chinese developmental dyslexics exhibited very similar brain patterns as those of their English counterparts. Compared with matched monolingual readers, both Chinese and English dyslexics manifested reduced activation in the LPMG, left posterior middle temporal gyrus, left occipitotemporal cortex, and left angular gyrus when carrying out a semantic words matching task. The authors concluded that there is a universal neural origin for both Chinese and English dyslexics.

These inconsistent results from neuroimaging studies on Chinese developmental dyslexia make it difficult to argue that Chinese developmental dyslexics really have unique cognitive underpinnings or manifestations in associated brain patterns. However, it remains a possibility that more brain regions may be involved in Chinese writing processing, at least at a deeper level, for Chinese children compared to their Western counterparts given the realities of Chinese reading and writing mastery. It is well known, for example, that Chinese characters represent complex visual-spatial structures; Chinese learners must, therefore, memorize a large number of such patterns, each one mapped to a whole word or morpheme, in order to be a good reader. Moreover, within most Chinese characters, there is a semantic radical, which has no clear analogy to alphabetic processing. This radical often gives a clue to the meaning of the character (e.g., related to water, related to the mouth, related to wood, etc.). Most Chinese words are also comprised of more than one character, and individual characters indicate meaning

within words (e.g., the character *ren2* 人 (meaning *person*), is found in many words that indicate a type of person, such as *meiguozhoren2* 美国人 'American', *waiqiaozhoren2* 外国人 'foreigner', *gongren2* 工人 'worker', or *daoren2* 大人 'adult'. Thus at both the character and the word levels in Chinese, meaning-based aspects of print are integral to reading. Finally, Chinese literacy acquisition often requires considerable efforts in visuo-motor skills because copying of Chinese characters is so important for the learning process (e.g., Tan et al. 2005). Thus Chinese literacy acquisition may make use of a variety of linguistic, perceptual, cognitive, and motor skills. In contrast, for readers of alphabetic languages, the key ability is to map letters or letter patterns (e.g., *eight* basically has same sound across words such as *eight*, *weight*, and *neighbor*) onto sounds, a skill that may primarily recruit regions related to mapping of orthography-phonology only (McBride-Chang and Zhong 2003; Perfetti et al. 2006).

Therefore, we think it is likely that more areas of the brain are probably co-opted at a potentially deeper level to learn and recognize Chinese, as compared to alphabetic print. This interesting issue should be considered in future work, both at the level of neuroscientific and behavioral investigation. Importantly, relative to the equivocal results found via fMRI studies related to brain abnormalities in Chinese developmental dyslexia, event-related potential studies on children with Chinese developmental dyslexia appear to demonstrate that, compared to typically developing children, they have deficits in both phonological (e.g. Meng et al. 2005) and orthographic (Meng et al. 2007; Wang et al. 2010) processing. Behavioral studies also point to a relatively wide variety of deficits in Chinese children with dyslexia (Ho et al. 2002). These include rapid automatized naming, morphological awareness, and visuo-orthographic processing as reviewed in the following.

Rapid automatized naming (RAN) is a relatively strong correlate of developmental dyslexia in both alphabetic languages and in Chinese. The RAN task was first used to differentiate children with dyslexia from typically developing children in the 1970s (Denckla and Rudel 1974, 1976; Neuhaus et al. 2001). It is measured as the ability to name as quickly as possible highly familiar visual stimuli, such as digits, letters, colors, and objects. Digits and letters are graphological stimuli, while colors and objects are nongraphological stimuli. Graphological tasks tend to be particularly strongly linked to word recognition skills across languages (e.g., Georgiou et al. 2008b; McBride-Chang and Manis 1996; Pan et al. 2011; Ziegler et al. 2010). Ho and colleagues have demonstrated that while phonological deficits are relatively rare, speeded naming and orthographic cognitive deficits are relatively prominent among Chinese dyslexic children in Hong Kong (Ho et al. 2002, 2004). Indeed, Ho et al. (2004) reported that 57% of their dyslexic sample manifested a rapid naming-related deficit. In a study of Chinese children from the Mainland (Li et al. 2009), the rate of rapid naming deficits in dyslexic children was 26.8%. In both typically developing and dyslexic children, RAN appears to be a consistent correlate of Chinese reading (e.g., Chow et al. 2005; Ding et al. 2010; Ho et al. 2004; Ho and Lai 1999; Georgiou et al. 2008a; McBride-Chang et al. 2011; Shu et al. 2006; Tong et al. 2011).

Despite the acknowledged importance of RAN in predicting dyslexia in Chinese, however, the nature of RAN (i.e., what a RAN construct measures) is under debate.

Originally, RAN was hypothesized to represent phonological processing skill, reflecting the rate of access to stored phonological information in long-term memory (Torgesen et al. 1997; Wagner and Torgesen 1987). Subsequently, Bowers and colleagues (e.g., Bowers and Wolf 1993; Bowers et al. 1994, 2000) proposed that RAN may be a marker of deficits in orthographic processing rather than phonological processing. Manis et al. (2000) offered preliminary support for this hypothesis by showing that RAN tasks accounted for more variance in orthographic-processing tasks than in phonological-processing tasks. In addition, Wolf (1997) argued that RAN is a complex, rapid integration of many cognitive, perceptual, and linguistic processes. Snyder and Downey (1995) suggested that some oral motor components may in part account for the slower naming speed as well. For now, the most important conclusion to be drawn from data across studies of RAN in relation to dyslexia in Chinese remains that RAN is a good clinical indicator of this disorder, both in correlational (e.g., Ding et al. 2010; Ho et al. 2004) and longitudinal studies that ultimately predict reading difficulties in Chinese children (Lei et al. 2011; McBride-Chang et al. 2011), perhaps in part because RAN tasks make use of so many different skills that are actually involved in reading itself.

A second area that has yielded relatively strong findings on correlates and predictors of dyslexia in Chinese is morphological awareness (e.g., Chung et al. 2010; Lei et al. 2011; Li et al. 2009; McBride-Chang et al. 2003; McBride-Chang et al. 2011; Shu et al. 2006; Wong et al. 2011). Chinese has many homophones and homographs; it also makes extensive use of lexical compounding (i.e., formation of compound words). Therefore, tasks that require children orally to distinguish homophone/homograph meanings are helpful in distinguishing those with and without dyslexia. An example is that 夏 in *xiatian* 夏天 (meaning 'summer') and 下 in *xiadun* 下楼 (meaning 'downstairs') share the same pronunciation of *xia4*; they are homophones. Somewhat similarly, 花 in *huaduo* 花朵 means 'flower', but 花 in *huafei* 花费 means 'cost'; 花 is the same character and pronounced the same (as *hua1*) across words. Another task that distinguishes Chinese children with and without dyslexia is one that requires the creation of novel compound words (e.g., a crown for a pig should be called a *pig crown* but not a *crown pig*). This is because children who can distinguish different meanings of same-sounding morphemes and manipulate morphemes easily (e.g., understanding that *take pan* and *pancake* in English or *yazshuai* 牙刷 'toothbrush' and *shuayaz* 刷牙 'to brush one's teeth' in Chinese have different meanings) using their knowledge of oral Chinese can map these morphemes onto print better, individually and in pairs or groups to form longer words, phrases, or sentences. This focus on morphological awareness at the compound-word level in relation to dyslexia is so far unique to Chinese for reasons mentioned previously, although lexical compounding has been found to be associated with word reading in Korean (e.g., Cho et al. 2011) and vocabulary knowledge in both Korean (McBride-Chang et al. 2008) and English (McBride-Chang et al. 2005) as well. Visuo-orthographic processing is a third area that distinguishes Chinese children with and without dyslexia (Chung et al. 2011; Ho et al. 2002, 2004; Wang et al. 2010). Ho et al. (2004) found orthographic deficits to be the second-most prominent deficit in Chinese children with dyslexia. These authors suggested that the association between

word reading and orthographic knowledge in Chinese is likely bidirectional, with grasping and automatizing orthographic rules being particularly challenging for those with dyslexia. Over time, word-reading experience promotes orthographic knowledge as well. Given that dyslexic children tend to read much less than typically developing children because of their frustrations with the process, this bidirectional association likely grows over time. In this context, visuo-orthographic processing often means a clear understanding of the function and positioning of semantic and phonetic radicals within compound characters, that is, those comprised of a semantic and a phonetic radical. Sometimes parents and teachers explicitly instruct children on the character structure (e.g., left-right or up-down), but many children are not instructed explicitly on such information (e.g., Ho et al. 2004). In a comparison of how mothers teach typically developing kindergarten children from Beijing and Hong Kong, for example, Lin et al. (2012) found that character structure was much more clearly emphasized by the Beijing as compared to the Hong Kong families, perhaps because of different approaches or traditions of literacy teaching in each society.

Apart from the clear difficulties of some children with dyslexia in discerning and internalizing orthographic patterns, there is also a question of broader skills related to visual patterning that has been examined in some studies of Chinese dyslexics as well. For example, Li et al. (2009) explored the extent to which dyslexic children have difficulties in pairing novel verbal and visual materials (paired associate learning) together that constitutes a major obstacle for these children. In that study, children were asked to carry out paired associates learning tasks, including both matching new visual stimuli with other visual stimuli (visual-visual) and matching new verbal stimuli with visual stimuli (verbal-visual). Only verbal-visual paired associate learning was significantly poorer in the children with dyslexia as compared to a control group of children. Furthermore, relative to those without dyslexia, these Chinese children with dyslexia had more difficulties with rule-based paired associate learning as contrasted with paired associate learning that was arbitrary. This is interesting given arguments by Ho et al. (2004) that Chinese children with dyslexia likely have particular difficulties in both understanding and internalizing orthographic rules. In the Li et al. (2009) study, the rules were novel and not based on orthographic patterns of print, yet the same difficulties emerged.

Researchers (e.g., Tan et al., 2005) have also argued that writing is particularly important for learning to read Chinese. Chinese calligraphy is an art form unto itself, but apart from this, an important component of instruction across all Chinese literacy learners is the focus on rote copying of Chinese characters. Given the importance of writing itself for Chinese, McBride-Chang et al. (2011) wondered whether copying might be a skill that could distinguish Chinese children with and without dyslexia. By definition, dyslexics have had less exposure to print than nondyslexics. Thus a strong test of copying skill in relation to dyslexia should focus on copying that does not involve character writing but rather unfamiliar print. In that study, the *refo*, McBride-Chang et al. had children copy Korean, Hebrew, and Vietnamese, all novel orthographies to these Chinese children, in different forms to test for copying differences. The copying was coded by coders blind to the identity of each child. Copying skill indeed distinguished the groups,

with dyslexic children scoring significantly more poorly on each of the three types of copying, suggesting that perhaps even copying skill itself might be associated with Chinese literacy acquisition and impairment.

It is important to reiterate once again here that different Chinese societies may manifest somewhat different correlates of reading impairment in Chinese given societal differences. For example, the ways of teaching Chinese in Hong Kong are somewhat different from those used in Mainland China. Hong Kong teachers tend to use the “look-and-say” method to teach children while Pinyin is widely taught in Mainland China and Taiwan makes use of Zhuyin. Thus Hong Kong Chinese children tend to focus on rapid retrieval of the names of Chinese characters, whereas in the Mainland and in Taiwan, as with English, grapheme-phoneme conversions are emphasized as a tool for learning Chinese. In addition, Mainland Chinese children learn to read simplified Chinese, which may present children with more noncompound characters that cannot be decomposed into component radicals. Thus children in Mainland China may need to memorize more morpheme-syllable units than do children in Hong Kong and Taiwan. These differences and their potential effects must be taken into consideration when we compare the research results of different locations, even within the same language family.

To conclude, developmental dyslexia in Chinese is a burgeoning field, with both some intriguing overlaps with findings from alphabetic orthographies and also some new research directions given the nature of Chinese. While children with dyslexia in Chinese do manifest phonological sensitivity difficulties in some studies (e.g., Cheung et al., 2009; Ho et al. 2002, 2004; Lei et al. 2011), such difficulties are often not as prominent as are slow naming speed, relatively weak morphological skills, or inefficient orthographic knowledge. Clearly, phonological skills are an important underpinning of dyslexia in Chinese. However, because there are many homophones and homographs and a relatively simple phonological system in oral Chinese, as well the fact that Chinese is an orthography for which phonological cues are relatively unreliable, researchers have branched out to consider morphological skills as potentially core metalinguistic indicators of dyslexia in Chinese (e.g., Lei et al., 2011; McBride-Chang et al. 2011; Shu et al. 2006). Researchers have also made great progress in understanding the complex visuo-orthographic rules that must be recognized, applied, and automatized in learning to recognize Chinese characters and words. Future research should expand on the idea of a “multiple deficit hypothesis” for understanding developmental dyslexia in Chinese (e.g., Ho et al. 2004) and move forward on clarifying the neurological markers of these difficulties as well.

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CHAPTER 53

DEVELOPMENTAL SPEECH AND LANGUAGE DISORDERS IN CHILDREN

HUA ZHU

SPEECH and language disorders (sometimes referred to as communication disorders) in children refer to atypical development of comprehension and/or production of language and speech. They occur after birth, progress during childhood, and resolve in some children; therefore, are very often described as “developmental.” In 2007, the number of children reported as having speech, language, and communication difficulties in the United Kingdom was 23.8% in primary school and 6.9% in secondary schools (RCSLT 2009). Although some children can recover spontaneously with age to a certain extent, speech and language disorders, if left untreated, can have serious immediate and long-term consequences for the children involved, who tend to have poor communication skills, less satisfactory academic performance, and low self-esteem.

This chapter begins with an overview of the causal and risk factors underlying speech and language disorders. It then provides an overview of the main findings in five types of speech and language disorders about which some substantial research evidence is available among Chinese-speaking children. The last section discusses the provision of speech and language therapy available for Chinese-speaking children.

53.1 CAUSAL AND RISK FACTORS

Aetiological causes are known in the case of organically based speech disorders. For example, developmental dyspraxia is associated with impairment in the motor control system; children with cleft palate tend to nasalize their speech and have difficulties in producing some consonants due to the dysfunction in their speech organs; children

with hearing impairment are likely to use delayed or unusual error patterns in their speech as the result of impoverished input.

Most children referred for speech and language therapy have “functional” speech and language disorders. These children have normal oral mechanism, hearing, intelligence, and social, emotional, and behavioral skills and do not have an apparent organic aetiology such as neurological problems relevant to speech production. To understand underlying causes for functional speech and language disorders, a number of risk factors have been identified.

- Genetic transmission. Parents of children with speech and language disorders often report other family members who have received speech and language therapy.
- Hearing problems. Fluctuating hearing abilities or temporary hearing loss (as the result of acute and frequent middle-ear infections, among others) at various stages of phonological development may result in abnormal speech development.
- Pre- and perinatal problems. Children with speech and language disorder have significantly higher incidence of prenatal and perinatal problems (e.g., difficult or premature birth, maternal infections, fetus-damaging medications during pregnancy, etc.)
- Reduced learning ability. Despite having an adequate amount of exposure to language (i.e., input), children may still have problems in taking in what they are exposed to (i.e., intake). The discrepancy in input and intake may be caused by a reduced learning ability to abstract and generalize patterns of the target language. Evidence can be found in the studies on development of word templates in children with speech disorders (Velleman and Vihman 2002; Zhu 2009).
- Social-economic and gender factors. This is a controversial issue. Although there is some evidence suggesting that more boys than girls and more children from families with low socioeconomic status than those from families with middle or high socioeconomic status are referred for speech assessment, some recent studies have failed to find significant correlation between speech and language disorders and the social-economic factors.

It is not always possible to identify a single causal or risk factor, either due to the lack of clear evidence associating developmental speech and language disorder with specific aetiological antecedents or risk factor (Shriberg and Kwiatkowski 1994) or due to the interaction of several causal or risk factors (Dodd 2005). For example, the possible effect of low socioeconomic status on speech development may be connected with the fact that children of such a background are likely to have less speech modeling and feedback from their parents and as well as inadequate exposure to language.

Many Chinese-speaking children also acquire or are exposed to other language(s) or dialect(s) at the same time in addition to the native Chinese variety they are acquiring. This is very common in areas where one or several varieties are used alongside the “official” or dominant variety of Chinese language (*Putonghua* ‘the common speech’ in the People’s Republic of China, *Guoyu* ‘national language’ in Taiwan, or Cantonese

in Hong Kong), or in diasporic Chinese communities where children are also exposed to the language used by the mainstream society in addition to the Chinese language(s) spoken at home. One of the questions frequently asked by parents and educators is whether bilingualism slows down the speed of learning or leads to speech and language disorders. The research evidence (Zhu Hua and Li Wei 2005; De Houwer 2009) shows that bilingual children may have some unique developmental characteristics. For example, they alternate between two languages in their speech, and they have added capacity to co-ordinate their two languages. The concerns that bilingual children might reach milestones later than children exposed to one language have no research evidence. The anecdotal report of “late” onset of speech among bilingual children is due to normal variations that also exist among monolingual children (De Houwer 2009; cf. Qiu et al. 2008).

53.2 REVIEWS OF DEVELOPMENTAL SPEECH AND LANGUAGE DISORDERS IN THE CHINESE CONTEXT

Systematic studies on developmental speech and language disorders among Chinese-speaking children have begun to emerge in recent years. Many studies focus on the characteristics of disordered speech and language among Chinese-speaking children. A brief summary is provided in the following sections for articulation disorder, phonological disorder, specific language impairment (SLI), dyslexia, and autism where some research evidence is available. We focus on two language varieties that have received most attention among researchers so far, that is, *Putonghua* (also referred to as Mandarin in some studies) and Cantonese. Case profiles are provided where data is available and feasible.

53.2.1 Articulation Disorder

Articulation disorder refers to speech difficulties solely associated with articulatory defects. Children with articulation disorders consistently distort a phone either in isolation or in any phonetic context. There are two well-known types of articulation disorders. One is *lisp* (commonly known as *da shetou* 大舌头 in *Putonghua*, literally, ‘big tongue’). The most common symptom associated with lisp is an inability to pronounce sibilants’ such as /s/ (z), /tʃ/ (c), /s/ (s), /ʃ/ (zh), /ʃ/ (ch), /ʃ/ (sh), /tʃ/ (j), /tʃ/ (q), and /ç/ (x) in *Putonghua*. People with lisp tend to replace target sounds either with dental lisp (the tip of the tongue touches or protrudes between the front teeth), lateral lisp (airstream spills over sides of the tongue), or palatal lisp (the body of the tongue raises against the hard palate). While lisp in some children is developmental and disappears

with age, in some cases it may be caused by articulatory defects such as a short frenum under the tongue and requires intervention.

The second type of articulation disorders is speech impediment caused by cleft palate. In addition to problems in resonance and nasal emission, other symptoms in the speech of people with cleft palate include nasalization of vowels, posterior placement (i.e., using glottal, pharyngeal, or velar sounds), simultaneous alveolar and velar contact or bilabial and velar contact, and initial consonant deletion. The study reports by Wu et al. (1988) on children from Taiwan and Stokes and Whitehill (1996) on Cantonese-speakers suggest that while Chinese-speaking children showed similar error patterns such as palatal realization of alveolar sounds as children from other linguistic backgrounds, there are some language-specific patterns. For example, Cantonese-speaking children with cleft palate tend to maintain the manner of fricatives in their speech production resulting in a good percentage of bilabial and glottal fricatives in their overall sound inventories. They also tend to glide /s/ in their speech. The following case profile is reported in Stokes and Whitehill (1996: 51).

A Cantonese-speaking child with cleft palate (age 9:3)

The child shows a high incidence of errors concerning alveolar plosives and affricates, fricatives /f/ and /s/ and the unaspirated velar plosive. Manner errors were rare, with a much higher incidence of structural processes (i.e. processes affecting the syllable structure). There was high variability in the error patterns for both affricates, both velar plosives, and the alveolar fricative. The overall pattern was mixed (both systemic and structural), but the main error patterns were of syllable structure and nasal emission. The child had moderate hypernasality as detected by perceptual judgement and nasometry.

53.2.2 Phonological Disorders

In contrast to articulation disorders, some children can produce a sound in isolation correctly but fail to produce it correctly in words, some can produce a sound correctly in contexts where it does not belong but consistently mispronounce it when it is expected, and some children have speech errors that are not limited to several sounds but spread over groups of sounds that share some similarities in the phonological features. These children seem to have difficulty not in articulation but in learning the manner in which speech sounds are patterned, or the phonology of the ambient language. This type of difficulty is referred to as a phonological disorder.

Zhu and Dodd (2000a) examine the phonological systems of thirty-three Putonghua-speaking children with functional phonological disorder using both quantitative measures (severity and inconsistency) and qualitative measures (phonetic inventory, phonemic inventory, and error patterns). The individual profiles suggest that children differed significantly in terms of the size of phonetic and phoneme inventories, types of error pattern, and degree of inconsistency. However, these children also exhibited some similarities.

First, despite the diversity of error patterns, the Putonghua-speaking children with phonological disorder seldom made tonal errors: only four (12%) children made vowel errors, and only four (12%) children used delayed processes affecting syllable-final consonants. Most errors affected syllable-initial consonants.

Second, certain sounds (e.g., velar stops /k/ (g) and /kʰ/ (k), retroflexes and affricates) are often absent from phoneme inventories in disordered phonology.

Third, apart from having restricted phonetic or phonemic inventories, disordered Putonghua phonology is similar to that of English-speaking children in that persisting delayed error patterns, use of unusual error patterns, or inconsistency in production occur or co-occur in the child's phonology. The existence of these characteristics allows the classification of subgroups of delayed development, consistent disorder, and inconsistent disorder. Nevertheless, despite these similarities, it is important to remember that which error patterns should be considered delayed or unusual varies from one language to another. For example, while "backing" is considered an atypical process in Cantonese-speaking children (So and Dodd 1994), it is frequently found in normally developing Putonghua-speaking children (Zhu and Dodd 2000b; Zhu 2002). Therefore, a Cantonese-speaking child using the backing process would be considered disordered but a Putonghua-speaking child would not. Note the following summary from Zhu and Dodd (2000a).

A Putonghua-speaking child with phonological disorder: (4:3, boy)

4 phonemes (/l, tɕʰ, s, ts/) missing from his phonemic inventory.

2 unusual error patterns (i.e. error patterns which do not occur in the normally developing phonology and thus indicative of disorder rather than delay in the speech):

- (a) substituting [tɕie] for the weakly stressed syllable [tsi];
 - (b) [n] and [ŋ] added at syllable-final position.
- 2 normal error patterns (i.e. error patterns that occur often in the normally developing phonology of children of similar age group):
- (a) Fronting retroflex as alveolar, e.g., /s/ → [s];
 - (b) Final /n/ deletion, e.g. /lien/ → [lie].

Several studies are available on the phonology of Cantonese-speaking children with phonological disorders (So and Dodd 1994; Cheung and Abbott 2000; Stokes 2002; for a review, see So 2006). The findings of these studies are largely consistent with those in Putonghua. Similar to Putonghua-speaking children, Cantonese-speaking children make very few tonal errors, with consonants being the most likely to be affected. Three subgroups of delayed development, consistent disorder, and inconsistent disorder in addition to articulation disorder are also identified among Cantonese-speaking children. In the following case study reported by So (2006:132), the Cantonese-speaking child is diagnosed with inconsistent phonological disorder.

A Cantonese-speaking children with "inconsistent" phonological disorder (age 4;7, boy)

- Missing phonemes were /s, t^h, n/.
- Most errors affected alveolar consonants /s, t^h, n/ and are summarized below:
 1. /t/ → [j], or delete, e.g. /tin/ was realized as [jin] and [in];
 2. /t^h/ → [h], or delete, e.g. /t^hɔŋ/ was realized as [hɔŋ] and [ɔŋ];
 3. /s/ → [h], [t], or delete, e.g. /sej/ was realized on different occasions as as[hɛj], [tɛj] and [ɛj];
 4. /l/ → [j], delete or correct, e.g. /lej/ was realized as [jej], [ej] or [lej] correctly;
 5. /n/ → [l], or delete, e.g. [nwɪ] was realized as /law/ or /wɪ/.

53.2.3 Specific Language Impairment

In contrast to phonological disorders that are concerned with *sound*, SLI refers to the type of difficulties in *language* production and/comprehension without any known cause such as hearing impairment, physical disability, or cognitive deficit. Current research suggests that the condition might be genetic. Children with SLI are two or three times more likely than normally developing children to have parents or siblings with a history of language problems. Some neurological deficits may co-occur with SLI (for a review, see Leonard 2004; Fletcher et al. 2006). The prevalence of SLI is estimated to be in the range of 2% to 7% of English-speaking preschool-age children (no comparable data is available about Chinese-speaking children).

There are cross-linguistic differences in the areas of language use, posing difficulties for children with SLI. While English-speaking children with SLI have difficulties with phonology and morphosyntax such as tense, agreement, and auxiliary verb omission, Chinese-speaking children with SLI and normally developing children are reported to have difficulties in the following areas:

- Productivity limitations with aspect markers such as *zòz* (过, perfective aspect) *gǎnz* (正在, experiential aspect), *gǎnz* (正在, progressive aspect), *zǎiyǎu* (在, durative aspect), *hǎng* (正在, delimitative aspect), *hǎi* (并, habitual aspect) in Cantonese (the Romanization of Cantonese is that of the Linguistic Society of Hong Kong [2002]). It was found that although Cantonese-speaking children with SLI show a similar pattern of development in frequency of aspect marker use (Stokes and Fletcher 2000) and sentence repetition tasks (Stokes and Fletcher 2003) compared with normally developing children, children with SLI seem to limit their use of aspect markers among a small number of verbs.
- Shorter utterance length and less lexically diverse than children of the same age (Klee et al. 2004).

- Poorer performance with passive constructions (Leonard et al. 2006) and who-object questions (Wong et al. 2004; for a review, see Fletcher et al. 2009).

53.2.4 Dyslexia

Developmental dyslexia refers to the type of impairment to reading ability that cannot be attributed to deficits in general intelligence or learning opportunities. It is estimated that about 5% of Chinese school-aged children experience this condition (Shu 2011). Children with dyslexia are poor spellers, have poor comprehension, or read more slowly than normally developing children. As an example, the following checklist cited in Ho et al. (2004) is used for diagnosing children with dyslexia in primary schools in Hong Kong:

- A poorer understanding of characters compared with that of speech.
- Unable to recognize and read commonly used Chinese characters.
- Takes longer than average in copying Chinese characters.
- While copying Chinese characters, strokes are omitted or wrong.
- Dictation result remains very poor.
- Unable to memorize times table well in spite of hard work.
- Unable to comprehend questions.
- Frequent loss of personal belongings (e.g., stationery, textbook) or forgetting to do homework or to bring exercise book.
- Difficulties in following a series of instructions.
- Gets distracted very easily.
- Difficulties in distinguishing orientation such as up, down, left, or right.
- Poor self-image.

Studies on alphabetic languages such as English, German, and French argue that knowledge about the mappings between print and sound is a prerequisite to development of literacy in these alphabetic languages. For nonalphabetic language such as Chinese, in which logographic writing system entails less systematic relationship between script and sound, the main difficulty for children with dyslexia lies in the accuracy and speed of character recognition, although a relatively small proportion have phonological deficits as well (for a review, see Stok et al. 2008; Klingebiel and Weeks 2009; Shu 2011). Other language-specific patterns among Chinese children show that children with dyslexia are more likely to have problems when learning Pinyin than characters (Yin and Weekes 2003). One-third of children with either language or phonological impairment also develop difficulties in reading and writing later (Lam and Cheung 1996; Cheung 2009).

53.2.5 Autism

Autism refers to the type of disorder associated with impaired functioning across communication, socialization, and imagination. Many children with this condition

have other disability or illness such as mental retardation, hearing impairment, or epilepsy, although they usually have normal physical development and good motor skills. There are more boys than girls who are diagnosed with this disorder. According to the *Diagnostic and Statistical Manual of Mental Disorders* (fourth edition) published by American Psychiatric Association and available research literature (for a review, see Paul 2004), the primary symptoms of autism include the following:

- Impairment in social interaction and difficulty in developing relationships with their peers.
- Impairment in communication, ranging from mutism (approximately half of children with autism never develop speech) to restricted verbal and nonverbal forms of communication. For children who do develop speech, they usually have a significantly delay in comprehension (e.g., echolalia, i.e. imitating speech one hears rather than responding to it) and pragmatic aspects of language use (e.g., marked impairment in turning-taking, initiating conversation, and inferring other people's mental states) and paralinguistic features (e.g., monotonous intonation and poor voice quality).
- Stereotypic patterns of behavior and preoccupations with routines and rituals.
- Delays in imaginative, in particular, symbolic play.

Very few studies are available on Children-speaking children with autism (Ha 1996; Li 2009). The following example is reported by Ha (1996:147). It is a conversation between a teacher and a child with autism.

An example of conversation with a child with autism

- Teacher: 她是阿姨吗?
Ta shi ayi ma?
- 'Is she Ayi (address term for unrelated female of parental generation)?'
- Child: 阿姨好!
Ayihao!
- 'Hi Ayi.'
- Teacher: 她是不是阿姨?
Ta shibushi ayi?
- 'Is she Ayi?'
- Child: 阿姨好!
Ayihao!
- 'Hi Ayi.'

The following example was observed by myself. The boy was about four years old and attending a mainstream nursery. He was imitating the researcher's question.

- Researcher: (pointing at a picture) 这是什么?
Zhe shi shenme?
'What is this?'
- Child: 这是什么?
Zhe shi shenme?
'What is this?'
- Researcher: 这是什么? 你看这是鼻子吗?
Zhe shi shenme? Ni kan zhe shi bizi ma?
'What is this? Is this a nose?'
- Child: 这是什么?
Zhe shi shenme?
'What is this?'

In a recent study, Li (2009) reported a fairly good level of flexibility in pragmatic use among four autistic Chinese-speaking children when interacting with their mothers. Li argued that this may be accounted for in terms of culture-specific parental interaction style associated with Chinese parents, who tend to initiate and lead conversations frequently.

53.3 PROVISION OF SPEECH AND LANGUAGE THERAPY SERVICE FOR CHINESE-SPEAKING CHILDREN

Provision for speech and language therapy service for Chinese-speaking population varies significantly in different regions. With the establishment of the Division of Speech and Hearing Sciences at the University of Hong Kong in 1988, there has been significant development in terms of the number of speech and language therapists, availability of assessments suitable for the local population, and access to the service. Nowadays, speech and language therapy service in Hong Kong is available in hospitals, child assessment centers, health service clinics, special schools, and other locations.

In the People's Republic of China, speech and language therapy services for children with developmental speech and language disorders are very much in an embryonic stage. A quick browse of websites shows that speech and language therapy service is almost exclusively offered at hospitals, and, where it is available, its target population are those with speech and language impairment with "organic" medical causes such as aphasia, cleft palate, dyspraxia, and so on. Special education in China has undergone significant changes since its start in 1949, and now six categories of disabilities

including visual, hearing, intellectual, physical, psychiatric, and multiple impairments are recognized officially. However, speech and language disorder is yet to be on the list.

In Taiwan, the Speech-Language-Hearing Association (*Taiwan Tingli Yuyan Xuehui*) was established in 1986 with the purpose of coordinating speech and language service in Taiwan, bringing together researchers in the field and promoting exchanges with external organizations. A closer look of its activities suggests a strong focus on providing intervention and support for the hearing impaired. The Chinese name of the association, 台湾听力语言学会, in fact puts "hearing" before "language."

In Singapore, where Mandarin is spoken along with three other official languages, there has been a rapid expansion of speech and language therapy since the mid-1980s. Currently there are a number of hospitals, special schools, early intervention centers, rehabilitation centers, as well as private practitioners offering speech and language therapy services, according to the Speech-Language and Hearing Association website. The main challenge facing speech and language therapists in Singapore is its linguistic complexities. In addition to four official languages (English, Mandarin, Malay, and Tamil), other varieties of Chinese languages and Indian languages are also widely used in the community. Singapore Colloquial English is also known to be substantially different from Standard English. Another challenge is that the referral rate is reported to be low, with most of referrals made through parents and doctors rather than schools (except for the schools set up for expatriate communities), and the age of referral seems to be older than in other areas where speech and language service is well established (Gupta 1993).

For Chinese-speaking children growing up outside the main Chinese-speaking countries or regions, speech and language therapy service is rudimentary in most areas. This is partly because there is general lack of understanding on the impact of bilingualism on speech and language development and lack of training in multilingualism among service providers. There is also a shortage of bilingual speech language therapists and a lack of standardized assessment tools in languages other than English. In reviewing challenges in improving services for Chinese American children, Chang (2009) listed some problematic clinical practices. Examples include interpreters are sometimes not used for children; parents are sometimes asked to serve as an interpreter; some parents are told to come back for a screening after the children have better English skills; and evaluations are not provided in the child's native language. To complicate the situation, there is lack of awareness of communication disorders and, sometimes, resistance toward being associated with a "disorder" among many Chinese Americans and immigrants from Asian countries (Cheng 2004; Chang 2009).

To conclude, this chapter is a brief survey of developmental speech and language disorders in the Chinese context and the main features of five types of disorders where empirical evidence are available. Although there has been some significant development in our knowledge about Chinese-speaking children with speech and language disorders, there is still a long way to go. The same also applies to speech and language therapy service for Chinese-speaking monolingual and bilingual children.

NOTES

1. The sounds are given in both /IPA/ and (Pinyin).

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CHAPTER 54

HONG KONG SIGN LANGUAGE

GLADYS TANG

54.1 INTRODUCTION

Sign languages differ from spoken languages in a number of ways. First, they are articulated through a visual spatial modality, and second, in language production, they make use of two independent but identical manual articulators (i.e., the two hands), facial muscles, the signer's body and head, and sometimes vocalizations. The adoption of such many "articulatory organs" has an effect on the ways sign language grammar is structured, in the sense that different combinations of these physiological attributes are employed to encode sign language grammar at the phonological, morphological, and syntactic level, leading to the general observations that the organization of linguistic units in sign language is highly simultaneous (Vermeerbergen et al. 2007). In this chapter, we offer a linguistic sketch about Hong Kong Sign Language (HKSL) based on the research conducted in recent years. Besides, the data suggest that HKSL and Cantonese are independent languages displaying differences in certain grammatical properties.

A discussion about the linguistics of HKSL would not be complete without a description about how it originated in the 1930s in Hong Kong and the course it took until the form we observe today. Like the emergence of a new sign language reported in Senghas and Coppola (2011), the establishment of a signing deaf school played a pivotal role in sparking the development of HKSL in the 1930s. However, it was not until the 1990s that linguistic research on HKSL began. In this chapter, we trace the origin of HKSL since the early 1930s then discuss recent research on the linguistics of HKSL at different levels.

54.2 HISTORICAL DEVELOPMENT
OF HONG KONG SIGN LANGUAGE

In recent linguistic studies about sign languages, various acronyms have been given to refer to the natural sign language varieties adopted by the deaf communities, such

as American Sign Language (ASL), British Sign Language (BSL), Australian Sign Language (AUSLAN), Brazilian Sign Language (LSB), and Chinese Sign Language (CSL). In Hong Kong, the Deaf communities prefer to use the term HKSL to distinguish it from the varieties of the Mainland. By natural sign language, we refer to those varieties that are acquired by deaf children from Deaf parents since birth and the linguistic systems that are passed down from one Deaf generation to the next. However, a great majority of deaf children are born of hearing parents and have no access to sign language. Many of them entered deaf schools when the policy of integration was not in full swing; hence they acquired sign language either from Deaf teachers or Deaf peers whose parents were Deaf. In fact, the evolution of sign language is tied closely to deaf education.

There were few historical records about deaf education, use of sign language, or the existence of a Deaf community before 1930s. A recent survey by Sze et al. (2013) attempted to reconstruct the history by gleaning from newspaper clippings, government documents about deaf news, and verbal reports from the elderly HKSL signers. According to them, the first deaf school—the Hong Kong School for the Deaf (HKSD)—was established in 1935, and it remained one of the main deaf schools in Hong Kong until its conversion to a regular school in 2004. Since its establishment, the school consistently adopted oralism in educating deaf students, and sign language was basically banned in the classroom. Although the education system perpetuates the misconception that learning sign language would adversely affect oral language development of deaf children, recent findings of sign language acquisition have begun to dispel such unfounded myths. In fact, the elderly HKSL signers who had studied at HKSD before recalled that deaf children in those days created signs and communicated through signs/gestures extensively among themselves after class or in the dormitory. These forms of signing spread quickly within the school and probably constituted the earliest form of HKSL. Yet the establishment of two signing deaf schools—the Overseas Chinese School for the Deaf and Dumb—by a deaf couple in 1948 and 1956, respectively, triggered a prolific development of HKSL. The Deaf couple, who fled to Hong Kong from the Mainland, brought with them the signing varieties from Nanjing and Shanghai. They used them to teach and interact with deaf students (*Overseas Chinese Daily News* 1962). As deaf students of these deaf schools intermingled within their communities, one may conjecture that HKSL evolved based on a mixture of Nanjing and Shanghai varieties as well as some indigenous signs from HKSD. Although the Overseas Chinese Schools for the Deaf and Dumb closed down in 1970s, their deaf graduates continued to use the signs and became signing models of deaf students from other education settings such as HKSD (Lo et al. 2010). These historical records justify a closer typological lineage between HKSL and Shanghai Sign Language or Nanjing Sign Language. A subsequent study by Woodward (1993) confirmed that HKSL and Shanghai Sign Language shared about 66% to 68% of the cognates in the basic vocabulary. Indeed the study by Woodward triggered a series of research projects to document the varieties of HKSL, and hence the commencement of sign linguistics research in HK.

Currently, according to the government's 2008 census, there are about 92,200 people who suffer from different degrees of hearing impairment in Hong Kong (1.3% of the total population), among which 8,600 (0.1% of the total population) were categorized as "completely deaf" (cf. Hong Kong Government 2008). Given the prevalence of oralism in supporting deaf children, we suspect that the number of Deaf signers is much smaller. What we as researchers could discern is the phenomenon that while the older signers formed their own cliques, communicating among themselves with an earlier form of HKSL, other varieties of HKSL also came from signs contributed by deaf students from four deaf schools that were in operation in the 1970s and 1980s, two of which had ceased to exist due to shrinkage of deaf student enrolments in recent years in favor of mainstream education. The only deaf school left in Hong Kong, the Hong Kong Lutheran School for the Deaf, claims to favor Total Communication.¹

Given these circumstances described above, HKSL reveals a certain degree of lexical variation, and signers can track the educational settings of their peers through the signs they adopt in their daily communications, giving rise to disputes about which signs are "correct" among the Deaf members of the communities and the misconceived promotion of "standardization" of HKSL. In fact, the onslaught of oralism and integration in deaf education as a government policy has sidelined if not undermined the development of HKSL, as deaf students, young or adult, are not supported by sign language in deaf education and fail to develop knowledge of this language as a first or second language. As a result, the number of fluent signers among the younger generations remains small.

In sum, this section outlines the historical backgrounds of HKSL against which a group of sign linguists embarked on a series of research in the 1990s until now. The findings thus far show that HKSL has its own independent grammar, which is different from that of Cantonese or Mandarin Chinese, the written form of Chinese adopted in Hong Kong education.

54.3 THE LINGUISTICS OF HONG KONG SIGN LANGUAGE

53.3.1 Phonology

Similar to other sign languages, HKSL has a system of sublexical, phonological contrasts in terms of handshape, location, movement, and orientation, allowing the language to create signs with different meanings. Examples are given below:

1. Contrastive handshapes

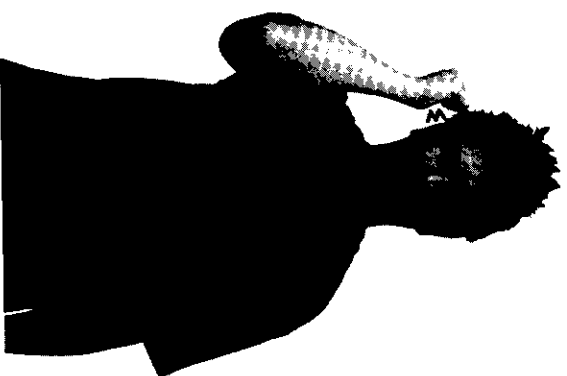


FIGURE 54.1A DIFFICULT



FIGURE 54.1B KNOW

2. Contrastive movements

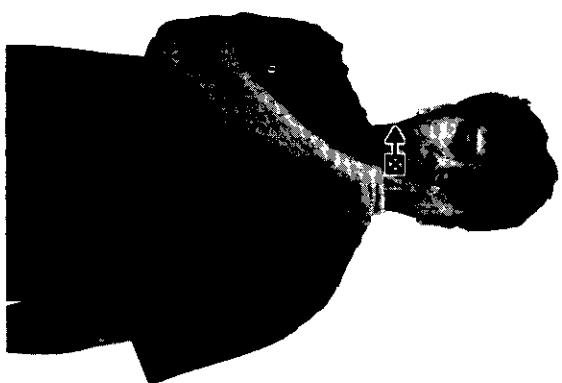


FIGURE 54.2A QUIET

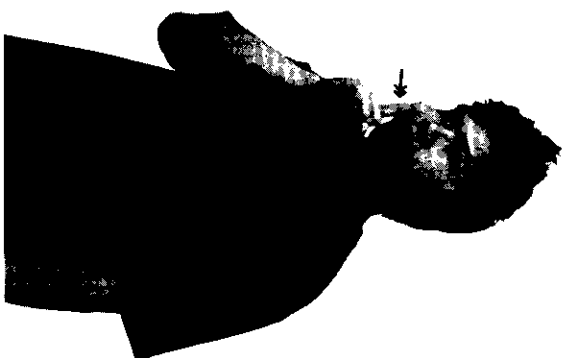


FIGURE 54.2B MOTHER

3. Contrastive palm orientations

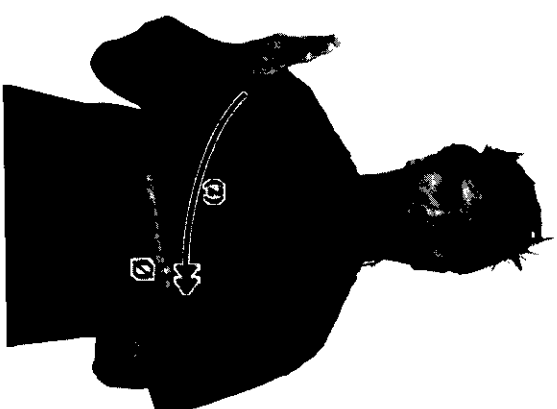


FIGURE 54.3A EXAMINATION

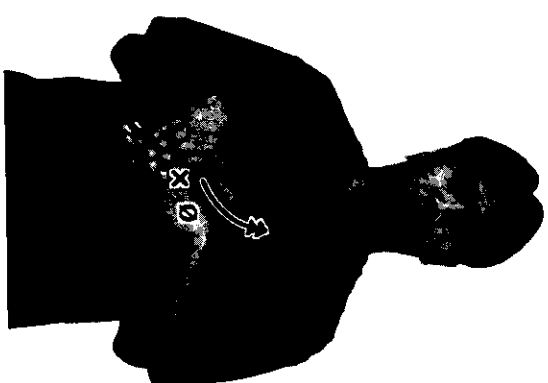


FIGURE 54.3B INCIDENTAL

4. Contrastive locations

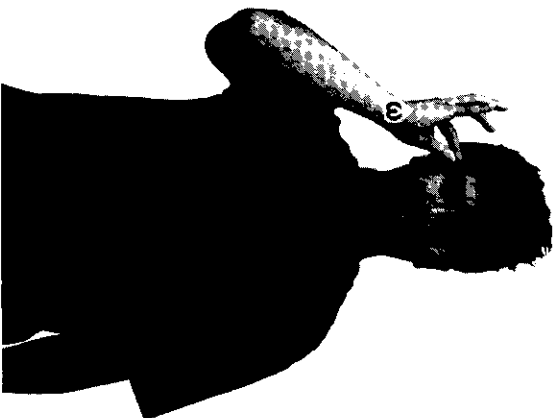


FIGURE 54.4A POOR

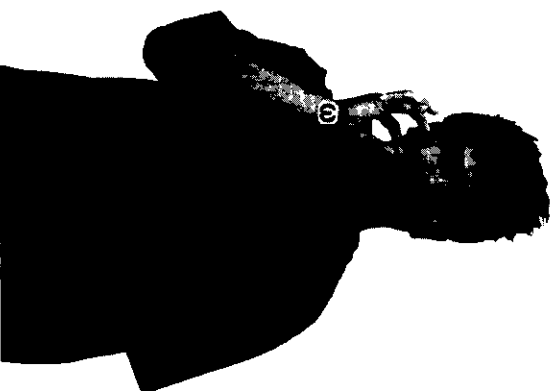


FIGURE 54.4B AGE

The goal of identifying these phonological contrasts is to establish a list of “phonemic” differences in terms of distinctive handshapes, palm orientations, locations, and movements. Brentari’s (1998) Prosodic Model cited different sets of plausible distinctive features within each of the parameters; however, whether these features are applicable to the analysis of other sign languages remains to be seen. An earlier attempt of such application was found in Tang (2007) in which she analyzed about 1,800 lexical signs in terms of “inherent” as well as “prosodic” features. Liddell and Johnson (1989) argued for simultaneity in sign language phonology where features of handshape, movement, palm orientation, and location are “stacked” onto each other in its formation. However, later studies revealed sequentiality in sign language phonology expressed in terms of dynamic changes of the movement parameter (Brentari 1998). Phonetically, movement is expressed in terms of transition between two stases, hence two timing units, leading to setting changes in path movement (e.g., up to down movement in CRUEL), aperture change (e.g., open to close fingers in LIGHT_OUT), or orientation change (e.g., pronation to supination of the wrist in CHANGE).

Simultaneity in HKSL phonology may also be analyzed in terms of combinations of different path and local movements in sign articulation. Mak and Tang (2011) identified three types of movement in HKSL: no movement, simplex movement, and complex movement. There are quite a number of signs in HKSL that contain no movement at all but an epenthesis movement to hold, such as REVENGEFUL. Simplex movements involve one type of dynamic change such as setting change, aperture change, or orientation change. Complex movements involve (a) a path movement overlaid with a local movement or (b) two local movements. For example, the sign SUGGEST involves a path movement from the temple of the head, overlaid with an opening movement of the fingers (i.e., aperture change from close to open). The sign RESOLVE involves a simultaneous combination of orientation change and aperture change. Interestingly, signs involving such combinations are not many in HKSL.

Another level of simultaneous layering of phonological information is by way of combining nonmanuals with the sign’s manual articulation (e.g., BAD). This sign is accompanied with pursed lips. The manual articulation of LAZY is overlaid with tongue protrusion and head tilt.

54.3.2 Morphology

54.3.2.1 *The Hong Kong Sign Language Lexicon*

In approaching the lexicon of a sign language, one needs to take into account the morphology of sign language, the age of the language, and the language contact situation between the sign language and spoken language of the community. The first factor also sets HKSL apart from Cantonese or Mandarin Chinese. HKSL, being an agglutinating language, is rich in inflectional morphology while Cantonese or Mandarin Chinese are said to be analytic with few inflectional morphological markers such as tense and agreement. Second, it has been well accepted that the sign languages under study so far are relatively young.

HKSL, for example, may have a history of no more than seventy to eighty years, which is in stark contrast with Chinese. The age factor has an effect on the extent of lexicalization in the language. Seen in this light, these two factors square well with the observation that the number of lexical signs in the lexicon is usually as small as a few thousand with many sign languages. However, as an agglutinating language, most signs of HKSL are made up of a whole host of affixes attached to a root that can also be a bound morpheme by itself. Lexical signs in the literature are usually referred to as the “frozen lexicon” as compared to the “productive lexicon,” which hosts a lot more signs linguistically analyzed as morphosyntactic constructions rather than lexical signs. The third factor, which is language contact between HKSL and spoken Cantonese, has led to interesting consequences. As sign language may be regarded as a minority language used by the Deaf communities, borrowing is common, and it seems to be unidirectional, that is, properties of the spoken language are borrowed into the sign language system. Brentari and Padden (2001) characterized the nature of a sign language lexicon as constituted by native and foreign signs. In the foreign lexicon, American Sign Language tends to incorporate the handshapes of the English alphabets to create many initialized signs such as *FAMILY* and *UNIVERSITY* and fingerspell signs such as *J-O-H-N*. This “foreign” lexicon is set apart from the native lexicon that is made up of core lexical signs and classifier predicates signs. In HKSL, just as in Taiwanese Sign Language and Chinese Sign Language, foreign signs revealing a Chinese origin are found, though not many, probably due to the complex orthographic nature of the Chinese characters. They are articulated by either finger configuration (e.g., FIELD “田”, Figure 54.5). What makes HKSL different from Taiwanese Sign Language and Chinese Sign Language is that HKSL does not have initialized signs or fingerspell signs in the lexicon because Cantonese romanization is restrictive in use in Hong Kong.

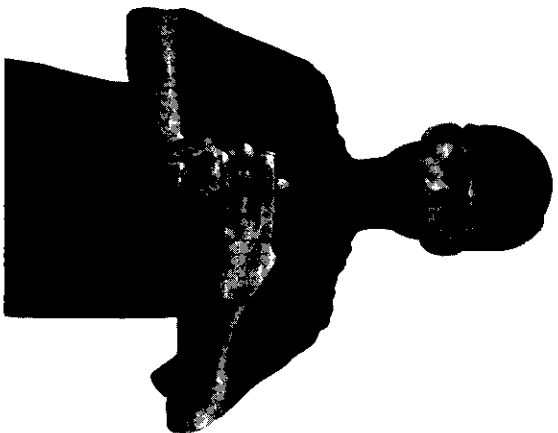


FIGURE 54.5 FIELD

54.3.2.2 Compounding

Citing Plag's (2006) works on pidgins and creoles, Meir et al. (2010) argued that sign languages employ compounding productively as a word formation process just as young spoken languages. Similar to spoken languages, sequential compounds in sign languages may be endocentric or exocentric. Examples of exocentric compounds are *SMALL\NATIVE* 'kindergarten' or *GOVERNMENT\STAMP* 'stamp duty'. It seems that although the meaning of exocentric compounds tends to be opaque in spoken languages, such opacity may be offset by iconicity, a characteristic of sign language, as these examples show. Endocentric compounds are also found. Examples of morphological heads of these compounds are *EAT* or *LEARN*, as in *MORNING\EAT* 'breakfast', *AFTERNOON\EAT* 'lunch' and *NIGHT\EAT* 'dinner', or *BIG\LEARN* 'university', *SMALL\LEARN* 'primary school', and *MIDDLE\LEARN* 'secondary school'. These compounds are said to be right headed, similar to Chinese, which also contains right-headed compounds. Unlike these examples that have a strong Cantonese influence, there are right-headed endocentric compounds that are intrinsic to HKSL, such as *RED\ROUND_OBJECT* 'tomato' and *RED\LONG_EAR\CYLINDRICAL_OBJECT* 'carrot', *GIVE_BIRTH\MALE* 'son' and *GIVE_BIRTH\FEMALE* 'daughter' or *MARRY\MALE* 'husband' and *MARRY\FEMALE* 'wife' where the first sign modifies the second, and it is the head that determines the class membership as well as grammatical category.

In addition to sequential compounds, HKSL also displays a category of simultaneous compounds. Most of these signs have an origin from two-handed signs encoding a classifier predicate. Some of these signs are subsequently lexicalized. Examples of such types of compounds are *LIFT*, literally glossed as “Cl:human_stands_on_flat_surface \RISE” or *HELICOPTER*, literally glossed as “ROTORS\CL:aircraft.” These simultaneous compounds are highly iconic in nature, as most classifier predicates are. However, they are treated as lexical signs rather than morphosyntactic constructions in certain contexts. Simultaneous compounds that do not stem from classifier predicates are exceedingly rare; examples are *WHAT_MONTH\WHAT_DATE* or *HARD_OF_HEARING*, which should be literally glossed as *HALF_ON_EAR\HALF_ON_MOUTH*. With these signs, we observe that the high degree of simultaneity has resulted in symmetry in the phonological components of handshape, palm orientation, location, as well as movement, in compliance with Battison's Symmetry condition of two-handed signs (Battison 1978).

54.3.2.3 Inflectional Morphology

Number and Negative Incorporation: Incorporation of numbers and the negative morpheme NOT is another example showing that simultaneity is at work also at the level of inflectional morphology. In number incorporation, the handshape of the number morpheme is incorporated into the stem sign, the location and movement of which are usually retained, but the handshape slot will be reserved for number, as in *TWO_MINUTE* and *THREE_YEAR* (Figure 54.6a). In negative incorporation, as in *SEE\NOT* and *HEAR_NOT* 'not heard of' (Figure 54.6b), the negator NOT is merged with the stem *SEE* or *HEAR*, and, as such, the phonological form differs from the citation NOT.

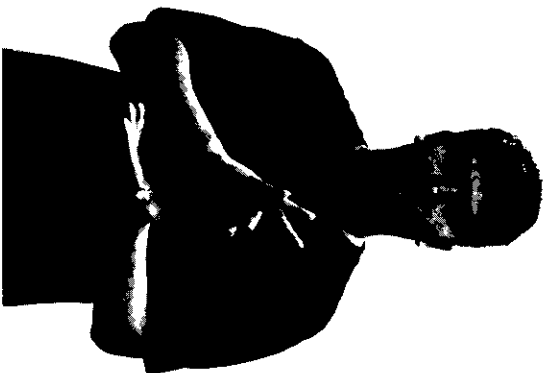


FIGURE 54.6A THREE_YEAR

Agreement and Aspectual Morphology: To understand simultaneity in verbal morphology, we first introduce the way verbs are classified in many sign languages. Generally speaking, they are classified according to whether they are lexical or morpho-syntactic in nature, or whether they involve person agreement and/or spatial agreement. Plain verbs, agreeing verbs, and spatial verbs have a lexical root, but classifier verb root

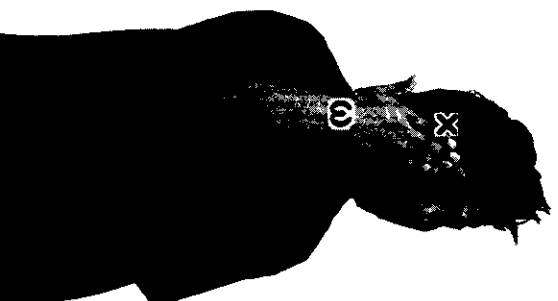


FIGURE 54.6B HEAR^NOT

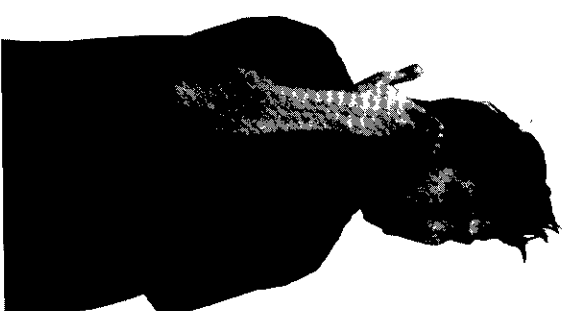


FIGURE 54.6B (continued)

is not lexical in nature. Within the category of lexical verbs, plain verbs do not encode person agreement; neither do they encode spatial agreement. Spatial verbs encode spatial agreement but not person agreement, and agreeing verbs encode both person and spatial agreement. Under these circumstances, simultaneity works on person and spatial agreement through path movement and direction to a locus in space. The locative morpheme is encoded by the beginning and end point of the path in space (i.e. two loci), and the direction of path movement of the verb may encode subject and/or object agreement, as in (1) and Figure 54.7.

- (1) KENNY YESTERDAY CAR, GIVE,
'Yesterday, Kenny gave me his car.'

According to Lam (2003), HKSJL adopts a three-way distinction with person agreement—first, second, and third—to mark grammatical relations, expressed through the direction of movement and location of the referents, real or imagined, in space. Other

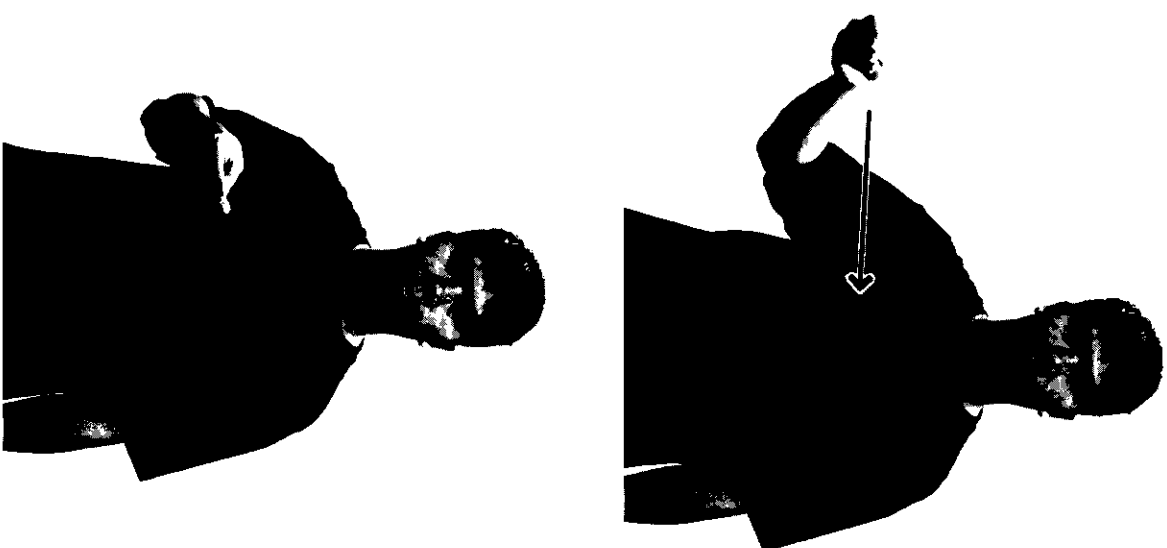


FIGURE 54.7, GIVE,

examples that show the subject and object verb agreement are ²TELL₁ and ³YOU₂. Take for example, in ³YOU₂, the direction of movement through space from one locus (third-person locus is on the either side of the signer's body) to the next (second-person locus is opposite the signer's body) indicates the grammatical relation between the subject and the indirect object. Under these circumstances, the loci as well as the direction of path movement are morphemic. Spatial verbs are less complex than agreeing verbs as they require movement direction to a locus (i.e., a locative morpheme) in space only, but the direction of movement is a phonological but not a morphemic unit. (2).

- (2) YESTERDAY KENNY KNIFE PUT_a, LEAVE. TODAY, KNIFE
NOT_HERE_a
'Yesterday, Kenny put the knife (here) and left. Today, the knife is no longer here'

Verb agreement morphology expressed through modulating the movement in space may be overlaid with additional movement features to encode aspectual morphology. One such feature is [repeat] with added intensity, as in (3):

- (3) IX-3 YESTERDAY TEXT SEND, many times IX-1 IGNORE₃.
'He texted (me) incessantly yesterday; I ignored (him).'

Event Quantification: Lam (2008) also observes that event quantification is encoded through combining the default movement with additional movement features or an additional articulator. She argues that the so-called number markers "trial," "exhaustive," and "multiple" are in fact verbal quantifier markers and number markers combined. "Trial" can be interpreted as "each," "exhaustive" as "every," and "multiple" as "all." Technically aside, these movements for quantification may be combined simultaneously with person and spatial agreement in agreeing verbs, as shown in (4a).²

- (4) TODAY STUDENT THREE COME NOT_HAVE; TEACHER ANGRY
EMAIL_EXHAUSTIVE SCOLD_EXHAUSTIVE.
'Three students did not come today; the teacher was very angry. She/he emailed and scolded each of them.'

In (4), the direction of movement is maintained to show grammatical relations, but the shape of movement is modified for encoding event quantification. In this case, the single straight path to a locus for encoding an event is being reduplicated to different loci for individual subevents. 'Every' is represented by a series of repeated circular paths, and 'all' by an arc.

In sum, the research so far shows that in encoding properties such as grammatical relations, aspectuality as well as quantification simultaneously is made possible by modulating the movement parameter systematically. In the next section, we discuss how simultaneity manifests itself in classifier predicates, a construction commonly observed in sign languages.

Classifier Predicates: Classifier predicates are morphosyntactic structures composed of two obligatory affixes—a handshape affix and a movement affix—together with a host of other inflectional morphemes to encode the event properties. The handshapes, sometimes called “classifier handshapes” are associated with the arguments in the predicate. Following the conventional literature, classifier handshapes can be categorized into semantic, handle, size and shape specifiers, and body parts. The movement affix encodes the predicate root and the associated temporal and aspectual properties of the event. In HKSL, systematic study has been conducted on motion and location predicates (Tang 2003; Tang and Gu 2006), as well as causative and unaccusative predicates (Lau 2002). It has been suggested that iconicity is prevalent in classifier predicates (Tai 2005): in fact, simultaneity is just as prevalent as iconicity in sign languages. Tang et al. (2006) show that coordinated events can be signed simultaneously in HKSL, as in (5) and Figure 54.8:

- (5) BRENDA SIT_i WATCH_TV, APPLE_i take+CL_handle:apple_i eat+
CL_handle:apple+ WATCH_TV
‘Brenda sits and watches TV; (she) takes an apple, eats it and watches TV (at the same time).’



FIGURE 54.8 eat+CL_handle:apple+WATCH_TV

54.3.3 Syntactic Word Order and Nonmanuals

In HKSL, although SVO is the most frequently attested word order variation is common (Sze 2009). According to Sze (2008), plain verb sentences with semantically reversible subjects and objects require a rigid SVO order. However, sentences with agreeing verbs or classifier predicates that invoke spatial elements may lead to SOV orders, as in (6a) and (6b).

- (6) a. FATHER LIKE PIZZA
‘Father likes pizza.’
b. FATHER_a MOTHER_b KISS_{3a}_{3b}
‘Father kisses mother.’

While manual signs occur in a serial fashion, as in (6a) and (6b), it is common that they are overlaid simultaneously with linguistic nonmanuals, the functions of which can be lexical, phonological, morphological, or syntactic (Baker-Shenk 1983; Wilbur 2000; Sze 2008; Tang et al. 2010; Pfau and Quer 2010). At the prosodic level, cues such as eye blinks and head nods occur usually at the right edge of phonological or intonational phrases, which signal constituent boundaries at the syntactic level, as in (7a). Using muscles of the lower face to produce nonmanual adverbials is also attested in HKSL, as such as tongue protrusion in (7b). Last, the muscles of the upper face make possible brow movements for a variety of syntactic functions such as brow raise for topics (Sze 2011), as in (7c), and conditionals (Tang and Lau 2012), as well as brow furrow for wh-questions (Tang 2006).

- (7) a. MALE_i be-located+CL_sem:male_i IX-3 jump+CL_sem:male_i LONG_TIME
‘The man is located here; he has been jumping for a long time.’
(Eye blinks and head nods at syntactic boundaries)
_____ carelessly (protruded tongue)
b. KENNY IX-a PLAY_PIANO.
‘Kenny plays the piano carelessly.’
(adverbial nonmanuals)
_____ br
c. HAT BLUE IXa PETER BUY.
‘The blue hat over there, Peter bought (it).’
(brow raise for topicalization)

These examples show that in sign language production, the manual signs are arranged serially but they may be overlaid with groups of nonmanuals for different linguistic functions. Also, eye blinks and head nods, which occur at constituent boundaries, enable researchers to chunk streams of signing into analyzable syntactic units.

5.4.4 CONCLUSION

In this chapter, we have briefly summarized the organization of linguistic units in HKSL. We pay particular attention to how sequentiality and simultaneity interact with each other in the expression of grammatical properties. Research so far has confirmed that movement may be composed of certain bound affixes associated with agreement, aspect, and number, while handshapes are associated with arguments and sometimes their number in a predicate. Like other sign languages, the manual signs of HKSL combine themselves with nonmanuals for various linguistic functions. One may ask whether this evidence is proof of modality effects, as sign languages are transmitted in the visual spatial modality. In fact, even when it is claimed that spoken languages are articulated serially; simultaneity of linguistic organization is also observed. For example, between segmental and suprasegmental phonology, the study of tone and intonation is exemplary of simultaneity in linguistic organization. As sign language research advances, cross-linguistic comparison might enable us to identify modality dependent as well as independent effects and to point to a better appreciation of the linguistic structure of natural languages.

NOTATION CONVENTIONS

In this chapter, glosses for signs are capitalized (e.g., GO). Signs entering a compound are marked with \wedge (e.g. WHAT_MONTH \wedge WHAT_DATE), and glosses encoding one sign are underscored (e.g., TAKE_A_PLANE). Nonmanuals are abbreviated (hn = head nods; ht = head turn; bd = body), and their scope is marked by a line above the glosses. Pointing signs are glossed as IX (IX-3 = third-person pronominal; IX-det = determiner; IX-det_a refers to a determiner indicating a locus in space).

ACKNOWLEDGMENTS

I would like to thank the Deaf researchers for their rigor in digging up the Deaf history of Hong Kong, in particular, the origin of HKSL and deaf education history. Such records could never have been compiled if not done by Deaf people themselves and to which they earn my deepest respect.

NOTES

1. Underlying Total Communication is the philosophy that deaf children should be allowed as many modes of communication as possible due to their diverse individual needs and capabilities. These include various forms of signing, speech, auditory input, written and visual cues such as cued speech, etc.
2. We are not sure at this stage of whether spatial verbs or plain verbs can merge with quantificational markers and further research will help to resolve this puzzle.

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CHAPTER 55

TAIWAN SIGN LANGUAGE

History, Structure, and Adaptation

JAMES H.-Y. TAI AND JANE S. TSAY

55.1 INTRODUCTION

TAIWAN Sign Language (TSL) is here defined as the native language developed and used by the deaf in Taiwan. Smith (2005) reported that it was used by approximately 30,000 deaf persons residing in Taiwan. According to the 2012 report of the Ministry of the Interior, Taiwan, there were about 122,285 citizens with Hearing Mechanism Disability in Taiwan.

The history of TSL can be dated back to when the school for the deaf was established in 1915 by the Japanese during the period of Japanese occupation of Taiwan (1895–1945). Little is known about what kind of sign language existed in Taiwan prior to the Japanese occupation. Korea was also occupied by Japan during 1910–1945. Therefore, TSL as well as Korean Sign Language are historically related to Japanese Sign Language. Even today, TSL still shares a high degree of similarity of lexicon to sign languages of Japan and Korea.¹

During the Japanese occupation of Taiwan, soon after the first deaf school was established in Tainan (in southern Taiwan) in 1915, another deaf school was founded in Taipei (in northern Taiwan) in 1917. The first group of Japanese teachers at Tainan Deaf School came from the Osaka area in Japan, while the first group of Japanese teachers at Taipei Deaf School came from the Tokyo area. The dialectal differences of Japanese Sign Language in these two areas thus contributed to the initial differences between the southern dialect and the northern dialect of TSL. These two TSL dialects are mutually intelligible; the grammatical structures for the two dialects are basically the same, and the differences are primarily lexical. For example, the words CAR, WINE, VEGETABLE, GREEN ONION, PINEAPPLE are signed differently in these two dialects of TSL.

After World War II, in 1945, Taiwan was turned over to China. The Japanese teachers at both schools for the deaf in Taiwan were sent back to Japan. The Taiwanese teachers at both schools continued to teach the students with Japanese Sign Language. In 1949, the Communist Party came to power in China, resulting in a large immigration of more than 2 million Chinese from Mainland China to Taiwan. Some deaf people and several former teachers at the Nanjing and Shanghai schools for the deaf also came to Taiwan and brought with them Chinese Sign Language. Therefore, some signs from Chinese Sign Language may also have been introduced into TSL.²

Also, after 1945, Mandarin Chinese replaced Japanese as the official language for education, administration, and mass media in Taiwan. At the same time, Signed Chinese became the medium of instruction at the deaf schools. Signed Chinese is an artificial language that employs Chinese grammar but adopts TSL signs and signs invented based on Chinese morphology.³ Although Signed Chinese is very different from TSL in morphology and syntax, it shares a large number of lexical items with TSL. In Taiwan, TSL is known as *ziran shouyu* 自然手语 'natural sign language', while Signed Chinese refers to the signed Mandarin Chinese known as *wenfa shouyu* 文法手语 'grammatical sign language', and Chinese Sign Language refers to the sign language used in mainland China, known as *zhongguo shouyu* 中国手语 'Chinese sign language'.

TSL and Signed Chinese in Taiwan are mutually intelligible, mainly at the level of the shared vocabulary and frozen phrases. In actual discourse the mutual intelligibility might be reduced due to the differences in grammatical structures. However, systematic investigations on the mutual intelligence are yet to be conducted.

In the following sections, we outline the phonology, morphology, and syntax of TSL.

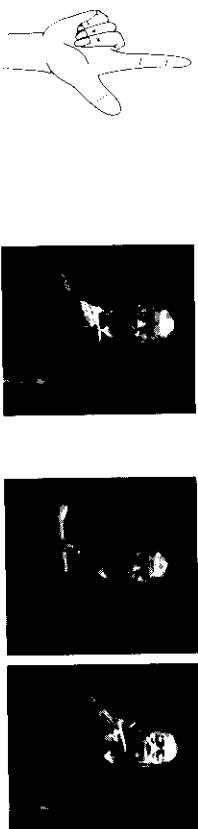
55.2 PHONOLOGY

As in all signed languages, TSL phonology can be described in terms of handshapes and their phonemic contrasts in location, movement, hand orientation, and nonmanual features.

55.2.1 Handshape Inventory

We have identified sixty-two distinctive handshapes for TSL based on a modification of previous research (cf. Smith and Ting 1979, 1984; Lee 2003; Chang et al. 2005). In these previous studies, handshapes in TSL were named in Chinese characters. In this chapter, we adopt the American Sign Language handshape names in English alphabet and numeral digits, plus necessary variations. Examples are given in (1).⁴

(1) SIX and FAST contain the same handshape L



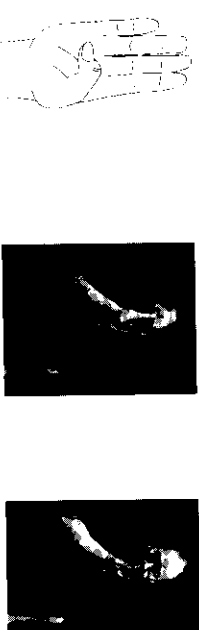
a. handshape L b. SIX c. FAST

Ann (1993, 2006) provides a physiological basis for handshape with a special focus on Taiwan Sign Language. See also Myers et al. (2005) for discussion on handshape change.

55.2.2 Phonemic Contrast in Location

PLEASE versus YES is a pair of signs that contrast in location. They both use the handshape B (2a), with the palm parallel to the center plane of the body. The index finger of the hand in PLEASE makes contact on the forehead (2b), while in YES ('confirmation') the contact is at the chin (2c).

(2) Phonemic contrast in location: PLEASE vs. YES

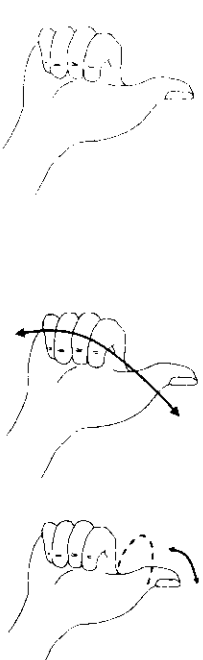


a. handshape B b. PLEASE c. YES

55.2.3 Phonemic Contrast in Movement

MALE versus THANK is a pair of signs that contrast in local movement. Both signs use the handshape open A (3a). In MALE (3b) the hand shakes horizontally, while in THANK (3c) the thumb bends repeatedly.

(3) Contrast in local movement: MALE vs. THANK



a. handshape Open A b. MALE c. THANK

55.2.4 Phonemic Contrast in Hand Orientation

NOW versus CALM-DOWN is a pair of signs that contrast in hand orientation. They both use the handshape Open B (4a) on both hands, and both start with the hands palm-downward and involve downward movements, but in NOW, the fingertips of both hands point forward away from the body (4b), while in CALM-DOWN they point toward each other (4c).

(4) Contrast in hand orientation: NOW vs. CALM-DOWN



a. Open B b. NOW

c. CALM-DOWN

55.2.5 Phonemic Contrast in Nonmanual Features

HEAD versus UNDERSTOOD is a pair of signs that contrast in nonmanual features. They both involve the handshape 1 (5a), with the index tip contacting the temple, but in HEAD no facial expression is made (5b), while in UNDERSTOOD, the mouth is rounded and sucks in air, and the head moves backward at the same time (5c).

(5) Contrast in nonmanual features: HEAD vs. UNDERSTOOD



a. handshape 1

b. HEAD

c. UNDERSTOOD

55.3 MORPHOLOGY

This section focuses on noun compounding (serial compounding and parallel compounding) and inflectional morphology.

55.3.1 Noun Compounding

Compounding differs from affixation in that more than one root morpheme is involved. There are many examples of serial compounds in TSL, which are distinguished from phrases by the order of the morphemes (sometimes reverse of that found in phrases), semantic opacity, and phonological simplification. In the following we illustrate the first two of these diagnostics (originally established for ASL by Liddell and Johnson 1986; see also Smith 1982).

Noun phrases in TSL usually have the order [noun^modifier]. So the [modifier^noun] or [noun^noun] structure suggests compounding. Examples in (6) illustrate nonphrasal morpheme order.

(6) Serial compounds: [modifier^noun] or [noun^noun]

a. APPLE = RED^FRUIT

b. JUDGE = LAW^MALLET

c. PERSONALITY = PERSON^HABBIT

d. HEARSE = COFFIN^CAR

Examples in (7) illustrate semantic opacity.

(7) Serial compounds: semantic opacity

a. COFFEE = BROWN^STIR

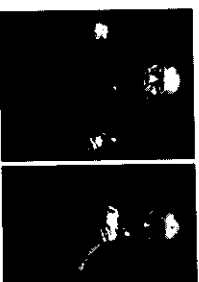
b. ONE OCLOCK = TIME^ONE

c. DEFICIT = RED^HIGH LEVEL

d. SURRENDER = WHITE^FLAG

Due to the simultaneity of visual modality, parallel compounding is also found in sign language. In MARRY, one hand with the sign MALE and the other hand with the sign FEMALE move simultaneously to meet each other in front of the chest (8). ("U" indicates that the two roots are produced simultaneously, i.e., parallel compound.)

(8) MARRY = MALLEUFEMALE (hands moving to meet each other)



MALLEUFEMALE—together

55.3.2 Verb Inflection

The classic work on TSL verb inflection is Smith (1989). Verb inflections in TSL include agreement and aspect markers but apparently not tense markers.

Agreement includes subject–object agreement (usually simultaneous/nonconcatenative), verb–subject agreement (using predicate classifier), gender agreement, and number agreement.

Aspect marking includes perfective, progressive, and durational aspect, which indicates prolonged status and/or intensity and frequency.

55.3.2.1 Agreement

The following are some general observations about agreement in TSL. First, agreement showing a grammatical relation is marked by nonconcatenative morphology, specifically by moving the hand away from the subject and/or toward the object. This appears to be a sign language universal (Aronoff et al. 2000), leading some to question whether this should be understood as grammatical agreement at all rather than as an iconic representation of relations between entities in some mental space (e.g., Liddell 2003).

As shown in (9) ‘The dog bit the cat’, the verb BITE moves from the agent DOG (co-indexed with *i*) toward the patient CAT (co-indexed with *j*).⁵ (Note that the patient CAT is signed first, possibly due to topicalization or a topic-comment structure.)

(9) The dog bit the cat.



a. CAT_{*i*}



b. DOG_{*j*}



c. BITE_{*-i*}

Second, some verbs also show agreement with the subject via the use of (predicate) classifiers (but see Liddell 2003 and Chang et al. 2005 for a different analysis).

In (10) ‘The dog entered the house’, HOUSE_{*i*} is mentioned first (10a). Then the subject DOG_{*j*} is signed in full form as in (10b) but in the form of an animal classifier DOG_{pro} being inflected on the verb ENTER_{*j*}; as in (10c). Example (10c) also illustrates classifier predicates in which both subject and object in proforms are simultaneously signed with the verb (Chang et al. 2005). In sign language research, (10c) has been referred to as a classifier predicate and the proform signed with the dominant moving hand as a classifier because the proform can represent different animals with four legs, exhibiting categorizing function as classifiers in spoken languages.

(10) The dog entered the house.



a. HOUSE_{*i*}



b. DOG_{*j*}



c. HOUSE_{pro} + DOG_{pro} – ENTER_{*j,i*}

Third, there also appears to be agreement with gender and number features. Gender agreement (if used) is also indicated by predicate classifiers. For example, the default form of TELL (someone) uses the thumb, as in (11a), while in (11b) ‘Tall her’, the third-person singular pronoun, indicated by the left position, is marked with the female classifier, the pinky.

(11) The difference between TELL and TELL-HER.



a. TELL



b. WOMAN_{pro} + TELL

55.3.2.2 Aspect Marking

Regarding aspect marking, it is not clear whether TSL marks perfective aspect on verbs of motion by holding the final position at the end of the verb, similar to what Sandler (1993) observed for ASL. As in (12), there seems to be a hold at the end, marking the termination of the sentence.

(12) The dog ran (has run) into the house.



a. HOUSE_{*i*}



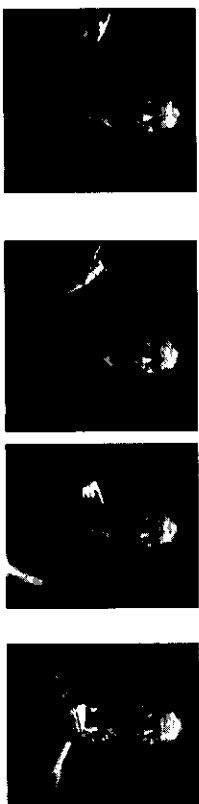
b. DOG_{*j*}



c. HOUSE_{pro} + DOG_{pro} – RUN INTO_[hold]

A more common way of expressing perfective is adding a morpheme ‘finished, terminated’ after the verb as in (13).

(13) He has come (arrived).



a. HE

b. COME

c. FINISH

Intensity and frequency are often marked by reduplication. Reduplication with a simultaneous raise of the hand(s) also indicates the increase of degree or intensity in either quality or quantity. For example, ADD is signed with the side of one fist (facing outward) touching the side of the other fist (facing inward). When the movement in ADD is reduplicated together with the reduplicated raise of the two hands, it means 'keep increasing'.

55.3.3 Classifier Constructions

The central part of sign language grammar involves classifier constructions. A classifier construction consists of a classifier and its simultaneously co-occurring predicate. Following Sandler and Lillo-Martin (2006), we include the description of classifier constructions in the section on morphology rather than syntax.

Classifiers in TSL are all from the basic handshapes. A catalogue of TSL classifiers with their categorization is given in Tables 55.1 to 55.7, based on a small set of physical and semantic features underlying the lexicon and syntax of human language.

Table 55.1 Whole entity classifiers in TSL—animate entities

| | | | |
|--|--------------------------|--|---------------------------------|
| | a. human beings, animals | | b. females |
| | c. animals, human beings | | d. human beings, males, animals |

Table 55.2 Whole entity classifiers in TSL—inanimate entities

| | | | |
|--|--|--|--|
| | a. 3D objects (ball, stone, apple) | | b. 3D small objects (small-size fruits) |
| | c. 2D round objects (CD, biscuit) | | d. 2D round small objects (coin, button) |
| | e. 2D flat objects (paper, leaf, surface of objects) | | f. 1D horizontal objects (river, road, rope) |
| | g. 1D vertical objects (flag pole) | | h. 0D small objects (raindrop, bean) |
| | i. train/truck/bike | | j. airplane |
| | k. car | | l. boat |

Table 55.3 Whole entity classifiers in TSL—instrument

| | | | |
|--|---------------|--|----------|
| | a. toothbrush | | b. comb |
| | c. scissors | | d. knife |

Table 55.4 Limb classifiers in TSL

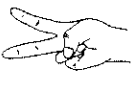
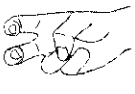

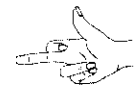
| | | | |
|---|------------------------------------|---|-----------------------|
|  | a. walking, standing, and swimming |  | b. kneeling down |
|  | c. jumping |  | d. jumping on one leg |

Table 55.5 Part classifiers in TSL—animate entities





| | | | |
|---|------------|---|--------------------|
|  | a. chicken |  | b. duck |
|  | c. goose |  | d. dragon, giraffe |

Table 55.6 Part classifiers in TSL—inanimate entities








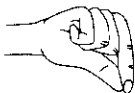
| | | | |
|---|-------------------------------------|---|-------------------|
|  | a. bicycle, motorcycle |  | b. telephone |
|  | c. spout (for filling the gasoline) |  | d. clothes hanger |

Table 55.7 Handling classifiers in TSL

| | | | |
|---|--|---|---|
|  | a. grasping concrete or abstract entities |  | b. round or cylindrical objects (ball, mug) |
|  | c. objects with handlers (hammer, toothbrush, saw) |  | d. tiny objects (needle, thread) |

55.4. BASIC SYNTAX

In addition to classifier constructions described in Section 54.3.3, the basic syntax of a sign language would involve word order centering around three types of verbs.

55.4.1 Three Types of Verbs and Word Order

Like in other sign languages, verbs in TSL can be classified into plain verbs, agreement verbs, and spatial verbs. Plain verbs do not move through sign space to show grammatical relations. They use SVO word order to indicate subject-object grammatical relation, although OSV and SOV orders are also very common due to topicalization of the object. Agreement verbs indicate the subject-object grammatical relationship by moving through sign space. Spatial verbs convey the information about movement and location of an object in the real world. The moved objects may be subject or object.

In other words, while spatial verbs move in topographic space, which reflects the layout of things in the real world, agreement verbs move in syntactic space, which is created within the language and may not map onto the real world (Sutton-Spence and Woll 1999). In the following sections, we briefly illustrate the three types of verbs.

55.4.1.1 Plain Verbs

Words such as LIKE, REMEMBER, FAMILIAR, THINK, FEAR, are plain verbs in TSL. They show relatively little modification and do not move through space to show grammatical information. Manner and aspect are marked in plain verbs by different speed of repetition of the verb and presence of nonmanual features. For example, to express the idea of doing something for a long time, the movement of the verb sign is typically lengthened. To indicate intensity, the verb sign is normally shortened and made with tense, retracted movements (Smith 1989:82–83).

Since plain verbs cannot move through space to show the information of grammatical relations, the subject and the object do not change the movement and orientation of the verb.

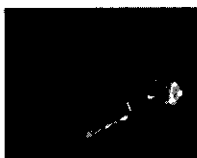
55.4.1.2 Agreement Verbs

Words such as BELIEVE, TELL, GIVE, ASK, SEE, PAY, and ANSWER are agreement verbs. Agreement verbs move through space to indicate the subject-object grammatical relationship, thus also allowing the inclusion of information about person and number of the subject and object. This is accomplished by moving the verb in syntactic space. That is, information about who is carrying out the action, and who or what is affected by the action, is shown by changes in movement and orientation of the verb.

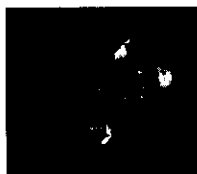
Unlike plain verbs, agreement verbs change their forms in accordance with the subject or object of the sentence. The different forms that these verbs assume reflect different combinations of subjects and objects. In (14) and (15), for example, the agreement verb BELIEVE moves toward the position where the object is located. In (14) the verb moves toward the object position, that is, MOTHER, whereas in (15) the signer is the object; therefore, the verb moves toward the signer himself.

(14) MOTHER MOTHER_{pro}+FATHER BELIEVE.

'(My) father believes (my) mother.'



a. MOTHER



b. MOTHER_{pro}+FATHER



c. BELIEVE

(15) FATHER BELIEVE-ME.

'(My) father believes me.'



a. FATHER



b. BELIEVE-ME

Note that in an agreement verb, there is a start point (subject agreement marker), a linear movement (verb stem), and then an end point (object agreement marker). In general, the starting point of these verbs is the location of the subject, while the end point is where the object is. However, the agreement verbs such as INVITE, TAKE-FROM, BORROW, and so on are exceptions to this generalization. These verbs show "backward agreement" where the start point marks the object and the end point marks the subject.

55.4.1.3 Spatial Verbs

Spatial verbs use topographic space, not syntactic space. Spatial verbs in TSL include RUN, JUMP, WALK-TO. These verbs are referred to as "verbs of motion and location" (Supalla 1982) or "spatial-locative predicates" (Smith 1989). The sentence in

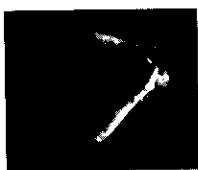
(16) is signed with a spatial verb RUN ABOUT and an animal classifier as in (16c). Note that the handshape for animal classifier is a bound morpheme and cannot be used in isolation.

(16) ROOM DOG ROOM_{pro}+ANIMAL-RUN.ABOUT.

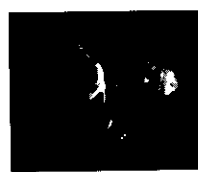
'The dog is running about in the room.'



a. ROOM



b. DOG



c. ROOM_{pro}+ANIMAL_{pro}-RUN.ABOUT

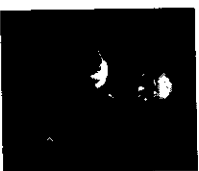
As in (16c), the predicate RUN ABOUT contains information about the movement of the subject, and the classifier handshape ANIMAL is used for any animals with similar features. It is observed that the full sign (e.g., the dog) is normally produced first, followed by the classifier morpheme (e.g., ANIMAL). The full sign is usually needed to identify the referent; otherwise it is impossible to identify what the referent really is. As analyzed by Supalla (1982), spatial predicates have two parts—a movement morpheme and a classifier handshape morpheme.

In addition, spatial verbs may inflect to show manner and aspect, but they do not inflect for person or number. They can give information about the path, trajectory, and speed of movement of the action described by the verb and about the location of the action.

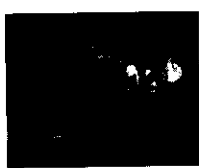
55.4.2 Auxiliaries and Word Order

One of the most interesting issues in sign language syntax is the general absence of auxiliaries in sign languages. TSL is the first sign language that has been demonstrated to have auxiliaries. Smith (1989, 1990) has identified three auxiliaries in TSL: Aux-1, Aux-2, and Aux-11, as given in (17).

(17)



Aux-1



Aux-2



Aux-11

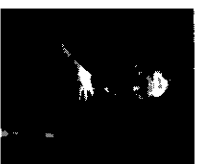
Their primary function is to convey the subject-object relationship in those situations where the main verb does not move in space. They occur before the main verb and carry the subject-object agreement for the main verb. Aux-1 is the most frequently used auxiliary. It uses the index figure to form the 1 handshape. To carry out the agreement, it begins with the tip of the 1 handshape either in contact with or just ahead of the center of the trunk and moves along a straight path to a new location wherein the tip of the index figure is pointing at the object locus. Aux-2 uses a bent V handshape to face an object locus, while the back of the hand faces the subject locus. Aux-1 is produced with both hands, with the strong hand acting on the weak hand. The strong hand is associated with the subject locus, while the stationary weak hand is associated with the object locus. Examples (18) and (19) illustrate how an auxiliary can be used to carry the agreement function for a plain verb.

(18) SISTER FEAR COCKROACH

'My sister is afraid of cockroaches.'



a. SISTER



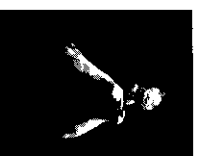
b. FEAR



c. COCKROACH

(19) COCKROACH SISTER AUX-2 FEAR

'My sister is afraid of cockroaches.'



a. COCKROACH



b. SISTER



c. AUX-2



d. FEAR

Note that in (19) the word order is OSAuxV. The fact that auxiliaries must occur before the main verb argues for their status as auxiliaries and for some scholars as a piece of evidence for SVO as the underlying order in TSL, even though OSV and SOV are most common surface word orders in this language.

55.4.3 Word Order and Nonmanual Expressions for Modals, Negation, and Question

While auxiliaries for agreement function are placed before the main verb, modals (epistemic and deontic) are placed after the main verb, as in (20) and (21).

(20) HE FALL-DOWN WILL

'He will fall down'

(21) MOTHER REST MUST

'My mother must rest.'

However, some modals can be placed either before or after the main verb. When placed before the verb, they might also carry a connotation of willingness and ability on the part of the subject, as in (22) and (23).

(22) HE WILL COME.

'He will come.'

(23) HE CAN COME.

'He can come.'

Negation and other negative expressions are invariably ordered after the main verb. The negation signs or signs with negation incorporated into them are accompanied by different kinds of facial expression and head movement. For example, in (24), the negation sign is accompanied with narrowed eyes (en) and head shake (hs), while lips kept together and pushed out (mm). In (25), the negation sign is accompanied with narrowed eyes, head tilted back (ht<), and tongue protruded (th).

(24) en/hs/mm

HE TALL NOT-HAVE

'He is not tall.'

(25) en/ht</th

HE SIGN LANGUAGE NOT-ABLE

'He doesn't know sign language.'

In wh-questions, question words such as "who," "what," "where," "when," and others are placed at the end of the sentence. They are also accompanied with nonmanual expressions.

For example, in (26), the question word "who" is also accompanied with eyes opened (eo), brows knitted (\wedge), and head tilted slightly forward (ht>). In (27), the question word "what" is accompanied with eyes narrowed, brows knitted, and head tilted slightly back.

(26) eo/ \wedge /ht>

LIKE HE WHO

'Who likes him?'

(27) en/ \wedge /ht<

YOU THINK WHAT

'What are you thinking about?'

Yes/no questions in TSL are generally expressed without a question mark at the end of the sentence. Rather, nonmanual expressions are either used at the very end of the sentence or accompany the predicate. For example, in (28), the nonmanual expression consisting of opened eyes, head nod (hn), and raised brows (\wedge) is used after the predicate 'be drunk'. In (29), the same nonmanual expression is used but co-occurring with the predicate rather than after.

(28) eo/hn/ Δ

BROTHER DRUNK

'Is your brother drunk?'

(29) eo/hn/ Δ

FATHER WORK

'Are your father working?'

55.5 LANGUAGE ENVIRONMENT AND ADAPTATION

TSL is historically related to Japanese Sign Language and still shares a large number of lexical items and syntactic features with it. However, it should be noticed that TSL was surrounded by speakers of Japanese and Southern Min Chinese before 1945 and by speakers of Mandarin Chinese and Southern Min Chinese afterward. In addition to the contact with different varieties of Chinese Sign Language used in different major cities in China, character signs based on the Chinese writing system are commonly used along with a few finger-spellings based on the English alphabet.

The following methods of construction of character signs in TSL have been identified by Ann (1998).

1. To imitate the shape of either the whole or a part of a Chinese character by means of handshape: 中, 王, 田
2. To trace either the whole or a part of a Chinese character in the air: 千, 就
3. To combine both (1) and (2) methods: 丁, 毛
4. To use both handshape and the mouth: 中, 品
5. To combine a natural sign with tracing: 太

Finger-spellings are used as M for McDanoud and MSN. In addition, loan translations from Chinese coinages are adopted for new things. For example, 'high speed railway', in addition to the mimic sign of the shape of the engine, can also be signed with TSL sign for 'high' compounded with sign for 'iron', a loan translation from the Chinese term 高铁 (high iron). Blending of TSL signs and character signs are also adopted to describe new things. For instance, 'cancer' is signed with TSL sign for the sickness plus the character sign for 疔, pattern after the Chinese character 癌, which consists of a radical for sickness and a component character for 疔. In short, TSL can always find ways to express new things.

There are three major deaf schools located in northern, central, and southern Taiwan. Since the early 1970s, the Total Communication approach has been adopted for school instruction. Spoken Mandarin Chinese, Sign Chinese, and Written Chinese have all been used in classroom instruction, while deaf students continue to use TSL to communicate with each other. Thus the three deaf schools have also contributed to the change of TSL in the past century.

Nonetheless, deaf culture and deaf community are still defined by the use of sign language. An example of the culture is to name a person by his or her physical characteristics, akin to nicknaming in spoken languages. Another example is to use visual but not auditory means for applauding, attracting attention, alarming, and so on.

The language ambience of TSL from language contact and deaf education renders the language formidable for pure linguistic analyses. Nonetheless, we will continue to update the TSL browser and the manuscript of TSL reference grammar to provide a database for analysis and learning of this sign language in Taiwan. The current edition (3rd edition) of this dictionary (Tsay et al. 2014) contains about 3,000 lexical items. Under each lexical item, there is a video of the signing with a text description in both Chinese and English. See <http://tsl.ccu.edu.tw/web/browser.htm>


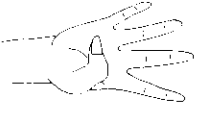


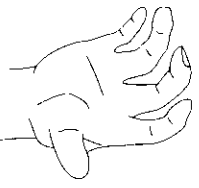


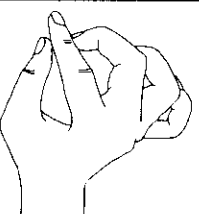
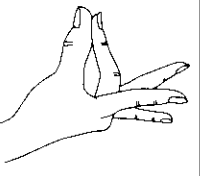

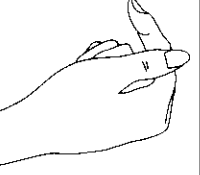
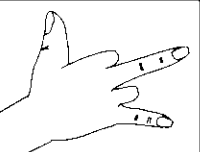
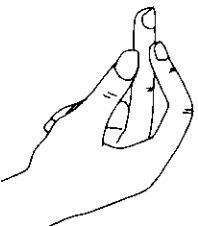




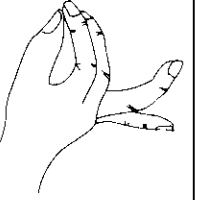
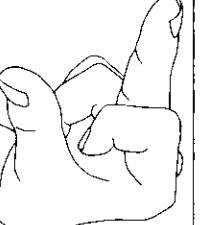
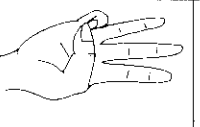
APPENDIX

HANDSHAPES IN TAIWAN SIGN LANGUAGE

Handshape names adopt the American Sign Language handshape names in the English alphabet and numeral digits with necessary variations. In parentheses are the handshapes names in Chinese characters used in previous studies on TSL. Romanization in Pinyin is provided along with the character names.

| | | | |
|-----------------------|--------------------|--------------------------|---------------------|
| | | | |
| Open A (男 nan) | Flexed A (副 fu) | B (胡 hu) | Open B (手 shou) |
| | | | |
| Bent B (九 jiu) | C (方 fang) | Bent C (绅 shen) | F (钱 qian) |
| | | | |
| Open F (WC) | G (像 xiang) | I (女 nv) | Flat I (T' qian) |
| | | | |
| Curved I (虫 chong) | K (次 qian) | Open K (布袋戏 budaixi) | L (六 liu) |
| | | | |
| Bent L (勿 wu) | Curved L (箭 ye) | Curved-Baby L (雄 nan) | Flexed L (很 hen) |

| | | | |
|------------------------|----------------------|-------------------------|------------------------|
| | | | |
| Extended N (鸭 ya) | O (零 ling) | Open O (果 guo) | Flat O (万 wan) |
| | | | |
| Bent-Baby O (鸡 ji) | R (笔 bi) | S (拳 quan) | U (统 tong) |
| | | | |
| Curved V (二十 ershi) | W (三 san) | Curved W (三十 sanshi) | Unspread W (董 tong) |
| | | | |
| X (十 shi) | Y (民 min) | L-1 (守 shou) | X-1 (奶奶 nainai) |
| | | | |
| 1-1 (语 yu) | Flat 1-1 (龙 long) | 1 (- yu) | 3 (七 qi) |

| | | | |
|---|--|--|--|
|  <p>Curved 3 (虎 nu)</p> |  <p>4 (四 si)</p> |  <p>Curved 4 (四+ sishi)</p> |  <p>5 (五 wu)</p> |
|  <p>Bent 5 (回 tong)</p> |  <p>5-Curved Pinky (八 ba)</p> |  <p>Curved 5-Pinky (八+ bashi)</p> |  <p>Piled 5 (姜 jiang)</p> |
|  <p>8 (借 jie)</p> |  <p>Open 8 (菜 cai)</p> |  <p>Crossed Thumb-Index (只 zhi)</p> |  <p>Thumb-Middle-Pinky (飞机 feiji)</p> |
|  <p>Curved-Index (鹅 e)</p> |  <p>Curved Middle (博 bo)</p> |  <p>Middle (兄 xiong)</p> |  <p>Curved-Index-Middle (高 gao)</p> |
|  <p>Ring (姐 jie)</p> |  <p>Ring-Pinky (百 bai)</p> |  <p>Bent Curved-Index-Middle (接 ai)</p> |  <p>Thumb-Pinky (细 xi)</p> |

NOTES

1. See "Lexical Comparison of Signs from Taiwan, Chinese, Japanese, and American Sign Languages: Taking Iconicity into Account" by Shioufen Su and James H.-Y. Tai in Tai and Tsay (2009), 149–176.
2. For a more detailed description of the history of deaf education in Taiwan during 1945 and 1949, see Smith (2005).
3. In most communities in the world, a natural sign language and an artificial signed language coexist based on the grammar of the spoken language in the same community.
4. Pictures of the demonstrator are from the TSL Database of the Sign Language Research Group at the National Chung Cheng University, Taiwan, unless otherwise noted. The use of pictures has the approval of the demonstrator Mr. Yushan Gu.
5. The notation convention in this chapter follows mostly MacLaughlin (1997). Glosses of signs are written with capital letters. A dotted marker is used in a multiword gloss, as in SHOW/UP or RUN/INTO. "v" is used between parts of a compound sign, for example, MARRY (MALE^FEMALE). "+" marks simultaneous signing with both hands.

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