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Speech Errors in Chinese: A Psycholinguistic Study

by

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A Dissertation Submitted in Partial Fulfillment of the
Requirements for the Degree of

DOCTOR OF PHILOSOPHY

in the Department of Linguistics

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Abstract

Speech errors in normal speech provide important information about the processing mechanisms of speaking, one of the most complex cognitive, linguistic, and motor skills that human beings use for communication. Studies of speech errors form a major part of psycholinguistic research on speech production, but until recently such research has been largely based on the evidence from only a few European languages. In contrast to most speech error analyses in English, this dissertation focuses on the discussion of speech errors in Chinese, illustrating that speech errors featuring Chinese language-specific characteristics imply some processing steps that are not observed in previous speech production models.

Similarities between speech errors in Chinese and English in terms of their patterns and classification suggest universality in speech production disorders in normal speech, but language-specific characteristics of the two languages suggest that English and Chinese speakers experience different processing steps in speech production, and err at different rates in different domains. For example, tonal errors in Chinese indicate that Chinese speakers undergo a special phonological process sub-step for tonal specification, this sub-step involves tone sandhi rule application, a processing task that does not concern non-tonal language speakers. A second example arises when, in the course of articulating a retrieved lexical item, the logophonographic features of the Chinese writing system provide phonological information about the lexical item through a processing step of “mental visualization”. Partial visualization or incorrect phonological processing of the

mentally visualized items can lead to errors of the logo-phonographic type which are not found in alphabetic languages such as English. Third, bilingual errors show that mixing of syntactic and phonological features of two different languages can occur when speech is being planned by bilingual speakers. Lastly, socio-cultural values in Chinese, such as those that involve address patterns and kinship term systems, can lead to errors that are rarely experienced by English speakers. Such different types of speech errors found in Chinese provide evidence that speech in Chinese is mediated by certain steps that have not been described in the many speech production models based on evidence derived from English errors.

In general agreement with the functional-positional speech production model of Garrett (1975, 1988) and the overall language production schema of Levelt (1989, 1992), this dissertation argues for a unified speech production model that describes each of the ordered steps in the speech production process, including conceptualization, formulation, and articulation. Such a model does not over-emphasize either the linguistic or psychological factors that cause speech errors. In order to precisely account for speech errors of all types in all natural languages, this model involves a set of ordered cognitive activities with psychological, linguistic, socio-cultural and contextual factors under full consideration.

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To my parents in China

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Chapter 1

Introduction

1.1 Basic questions about speech errors

Speaking is the primary form of communication among human beings in daily life. That people make errors in their normal speech is not unfamiliar to most speakers. But what is not so well-known about speech behavior is why errors occur, and what these errors tell us about how speech is processed in the course of speech production. Linguists have long been interested in the phenomenon of speech errors, and research in this area dates from Arab scholarship in the eighth century AD (Fromkin 1988). The systematic studies of speech errors as an independent psycholinguistic topic has been going on in Europe and North America for over a century, starting with Meringer and Mayer's (1895) pioneer work on German speech errors. Speech error research has attracted much attention in the past few decades, not only from linguists, but also from scholars in disciplines as diverse as psychology, sociology, education, philosophy, cognitive science, and computer science. Ever-increasing data bases in different languages have provided more evidence to support theoretical explorations of the language production process. These new theories, based on the accumulated evidence from speech errors, shed new light on the mechanisms involved in language production. Many questions remain, but the study of speech errors, or that of language production in general, has blossomed into an

inter-disciplinary field of research which promises interesting answers to basic questions about human speech behavior.

In fluent speech, we normally produce two to three words per second. Although we know tens of thousands of words in the lexicon, selection errors occur only between 0.25 and 2.3 per thousand words (Bock & Levelt 1994). But what are counted as errors in speech? My own interest in the study of speech errors began when I was taking an introductory course in psycholinguistics a few years ago. The term "speech error" was relatively new to me at the time, and was introduced as a concept different from what I had understood before. My language-teaching experience in the past had always linked the concept of "error analysis" to ungrammatical, or improperly pronounced, sentences by students learning a second or foreign language. Examples like **His English is gooder than me*, or mispronouncing the English word *ugly* as [ˈju:glai], constituted the dimensions of my category of "speech errors". The cause of such errors was unfamiliarity with, or insufficient knowledge of, the language being learned.

But this is not the major concern of psycholinguistic studies of normal speech production. The kind of speech errors studied in psycholinguistics are those found in the production of one's first language; these errors show not the process and problems of second language acquisition, but rather how one produces his or her native language in real-time. Although errors that occur in the course of foreign or second language learning and those in the normal speech of one's first language may have similar patterns, they are different in what they reflect about the nature of language production. Using Reason's (1982) example to distinguish errors of different natures, an experienced housewife may accidentally pour tea into the sugar bowl, reflecting the difference between what her intention and skills allow her to do

and what influences from other factors such as absent-mindedness have caused her to do. But such absent-minded erroneous behavior should be in no way equated with the faltering efforts of a child making her first cup of tea, who spills the tea into the same sugar bowl. The blunder of the child is the kind that any novice could make due to the lack of competence, while the hallmark of true errors is *misapplied competence*. Similarly, lack of competence in the language being learned causes a second language learner to blunder. Speech errors by native speakers, on the other hand, reflect the mistakes of a skillful language user with native fluency and better illustrate the speech production process in the absence of such conditions as non-familiarity or incompetence with the language. In other words, speech errors reveal the speaker's knowledge (i.e. competence) of the correct forms from which the produced forms (i.e. performance) differ (Fromkin 1991)

There is a whole body of literature on the study of speech errors in Western psycholinguistics, with speech error data gathered mainly from European languages such as English and German. As a result, the theories and hypotheses that have emerged to describe speech error phenomena in these languages initially reflect European language structures. It is only in recent years that scholars have begun to apply Western linguistic theories to studies of speech errors in non-European languages. Studies of speech errors have been conducted in many languages so far, but not much has been documented about speech errors in Chinese, a language which is dramatically different from European languages in many respects. Linguists assume that speech errors occur in all natural languages, since they reflect the inner workings of the speech production mechanisms, regardless of the language in question. However, different languages present different characteristics that are embedded within language-specific grammatical structures. If speech errors occur in Chinese, would they occur in patterns similar to those in other languages, we might

ask? Or would the language-specific characteristics of Chinese also be reflected in the speech errors which arise?

Speech errors are not studied for the sake of finding the patterns that occur, but for a better understanding of the language production process, with the specific objective of creating an appropriate and comprehensive speech production model. Therefore, our questions about speech errors in Chinese focus on the speech production mechanisms. Firstly, if Chinese errors show features different from what have been extensively discussed for English, can speech production models based on English errors still account for the speech production process in Chinese? Secondly, social-cultural factors within a community can influence both cognitive and cultural behaviors of individuals within a given society. Would such factors in the Chinese speech community also influence speech production, leading to speech errors that are not found in other languages and cultures? Thirdly, when a speaker is a Chinese-English bilingual, would the speaker process speech in both languages simultaneously, resulting in errors of a bilingual type? Furthermore, if we assume that speech errors occur in all known languages, would the error rate be the same cross-linguistically? These interesting questions have not yet been addressed in the literature, since few studies of Chinese speech errors have occurred and minimal speech error data is available for comparison. This dissertation intends to answer these questions, based on a discussion of my own collection of speech errors in Mandarin Chinese.

1.2 About the data

Speech errors are generally defined as unintended speech performance in normal speech caused by a conflict between the target and an intrusion which are

typically linguistically or psychologically related. Linguistically, an error and its target can be related at least at the three levels of phonology, syntax, and semantics. From a psychological point of view, speech errors are believed to represent the speaker's cognitive state, which can be influenced by psychological disturbances (e.g., emotional changes) and contextual factors (e.g., visual or auditory stimulus). This dissertation will discuss speech errors in Chinese that are caused by both linguistic and psychological factors at different levels.

The decision to pursue a dissertation on speech errors in Chinese has been prompted by the scarcity of previous work to base my own research on. My first attempt on this topic was a short term paper in 1992, which led to a conference paper on the comparative study of speech errors in Chinese and English (see Yang 1993). The error examples reported there were largely anecdotal occurrences of my own slips of the tongue and those reported to me by my Chinese-speaking friends. But this was enough to pique my own curiosity on the matter. A preliminary search for formal publications or related databases on Chinese errors, including queries on the *Internet to Linguist List*, produced little result. The Chinese speech error examples provided by Moser (1991) and Shen (1992) were the only references available then, and were obviously not enough to serve as the database for a full analysis. Therefore, a substantive corpus of self-collected first-hand speech error data in Chinese was necessary for a formal psycholinguistic analysis, and this was the next step in preparing this dissertation topic.

“Speech error” is a very general term that encompasses various speech disturbances, including such verbal behavior as hesitations, pauses, tip of the tongue phenomena, and slips of the tongue. Since this dissertation mainly discusses the “slip of the tongue” phenomenon, the terms “speech error”, “verbal slips”, “slips of the

tongue”. and simply “slips” are used interchangeably with the same semantic denotation. The Chinese speech errors discussed in this dissertation arise from my own data collection (unless otherwise noted), a collection which has been gradually built up over the past few years.

The method of error data collection is relatively simple. I keep a notebook handy, and write down any speech errors that are “detected” in normal daily conversations with native Mandarin speakers. Some additional errors were captured from broadcast TV or radio programs. Although I recall the source and context of most errors that I have collected, personal information about the actual speakers (e.g., name, age, occupation and educational background) is never noted down. In order to verify the reliability of my error interpretation, I typically ask the speaker, whenever possible, to recall if an error has occurred in the previous utterance; and if it has, I ask for the original sentence he or she had intended to say. In fact, most errors were so obvious that they were marked by a pause or correction on the part of the speaker. Although the number of errors in my collection (over 600) is not impressive when compared with over 8000 German errors collected by Meringer and Mayer (1895), they do represent the possible error types that occur in the speech of Mandarin Chinese.

This collection would not have been possible without the support of my family and friends, who have also helped me collect errors from speakers around them. The major part of the collection came from native Mandarin speakers in Victoria (most of whom are Chinese-English bilinguals), the other part of the collection came from Beijing and Shenyang in China, where standard Mandarin Chinese is used in daily conversation. After careful examination, some of the collected items were ruled out as real errors, since many individual, dialectal and

- (2) tā jīngcháng xiōng — xùjiǔ
他经常凶—酗酒
'he often gets drunk'
- (3) cǎi mógu de xiǎo gūniang, bēizhe yíge dà luókuāng →
采蘑菇的小姑娘, 背着一个大箩筐
'Picking mushrooms, the little girl is carrying a big basket'
- bēizhe yíge dà gūniang
..... 背着一个大姑娘
'Picking mushrooms, the little girl is carrying a big girl'

A single phoneme (e.g., a consonant or a vowel), a part of a syllable (e.g., an initial or a final as in the Chinese phonological terms), or the whole syllable will be put between two slashes, such as /t/, /a/, /-ing/, or /zhang/. Note that the pinyin symbols between the slashes are not to be taken as IPA symbols since *pinyin* is just a writing system that represents Mandarin sound in different ways from IPA symbols (see Tables 1.1 and 1.2). Phonetic features will be marked with a pair of square brackets, such as [+nasal]. Although tone markers are provided for most error examples, a set of alternative representations (e.g., T1 for first tone, T2 for second tone) will also be indicated to provide clarity of tone differences in the discussion of tone errors. In the discussion of Chinese error examples, the English gloss will be provided only for the target utterance, but not the error (unless the error is also a semantically legitimate sentence).

1.3 The organization

The introductory comments in this chapter are expanded in Chapter Two which reviews the historical development of speech error studies. The interest in speech error analysis dates back to over a thousand years ago when Arabic-speaking linguists used the term “error” to describe non-standard sentences used by non-native

Arab speakers. Although speech errors such as “spoonerisms” were found to occur in 16th century European theatre, systematic studies based on large-scale data collection did not begin until Meringer and Mayer’s (1895) published collection with accompanying analysis. Later scholars (e.g., Fromkin 1971, 1973; Laver 1969; Nootboom 1969; Garrett 1975; Fay 1980) developed this interest into the full range of speech production models that we see in the literature today.

Studies of Chinese speech errors did not start until a few years ago, when Zhang (1990), Moser (1991) and Shen (1992) applied Western psycholinguistic theories in the analysis of speech errors in Chinese. The question of whether speech errors in Chinese and those found in other languages are similar in pattern will be addressed in Chapter Three. In this chapter, different types of Chinese errors are compared to those typical English errors that form the basis of the literature used in speech error studies. Chapter Three shows that speech errors do occur in different languages, and in basically the same patterns. But it also shows that, despite such similarities, error research so far has not accounted for many kinds of speech error phenomena that occur in languages other than English. Language-specific characteristics of individual languages may result in speech errors that have not been discussed in the literature. Chapter Four presents such language-specific errors in Chinese, including errors that involve cognitive or articulatory slips with tones, glides, logo-phonographic characteristics of written characters in Chinese, and even errors of a bilingual type. The discussion in Chapter Four suggests that conventional analyses of speech errors must take language specifics into consideration in order for speech production models to be universally applicable.

Language-specific characteristics decide the likelihood of certain types of errors occurring. In contrast to English, the typical syllabic structure of Chinese

eliminates the possibility of errors that involve consonant clusters, and greatly reduces the rate of errors that involve sound exchanges within a word. On the other hand, the social and cultural properties of a language can reflect the speaker's vocabulary within a certain category, with the consequence that errors within this category are also increased. Chapter Five provides a detailed discussion of such social and cultural aspects, and of how they are reflected in speech errors.

Speech errors in whatever patterns in any language are not linguistically "valuable" *per se*, in that they are "by-products" of the conflict between what people intend to say and what is actually said. Linguists and psychologists do not collect errors simply for the sake of charting the patterns in which they occur, but to search through these error patterns for an understanding of how speech production is initiated and controlled. Numerous speech production models have been proposed by different linguists and psychologists alike, with each having its own special focus and characteristics. Chapter Six of this dissertation discusses these models in the light of Chinese speech errors. My conclusion is that the Chinese data provide support for Garrett (1975, 1988) and Levelt (1992, 1994), who propose a model of speech production which goes through two major processing stages – a functional stage and a positional stage. These two stages are linguistically independent, but psychological, contextual and socio-cultural factors in the speech production process link these two stages closer to each other and to other sub-stages of the speech production mechanisms.

The concluding remarks in Chapter Seven summarize the major points of this dissertation: speech errors occur in all languages, and in similar patterns: although the general error rate in speech may not differ dramatically, the language-specific characteristics determine the likelihood of errors in either linguistic or social-cultural

aspects, and accordingly, error rates differ in different language areas. Some Chinese language-specific features that are reflected in speech errors cannot be accounted for with currently available Western models for speech production, unless these models are modified in order to be universally applicable.

Speech error analysis in Chinese is an important part of the psycholinguistic study of speech production mechanisms. It reveals not only the linguistic characteristics of the Chinese language in a way that counterbalances the data gathered from the Western languages that have been so extensively discussed in the literature, but it also provides a testing ground for speech production theories which offer universalistic explanations of speech production models. Since studies of Chinese speech errors have been scarce, this dissertation is an original and much needed contribution to the study of speech errors in natural languages and theorizing about speech production mechanisms. It is my hope that this dissertation will provide crucial information about speech processes in Chinese, and in turn, that it will stimulate more contributions to the cross-linguistic, cross-cultural study of language.

**Correspondence between Pinyin (PY) Symbols and IPA
for Mandarin Initials**

Manner of Articulation. P/I	Unaspirated Stops		Aspirated Stops		Unaspirated Affricates		Aspirated Affricates		Nasals		Fricatives		Voiced Continuants	
	PY	IPA	PY	IPA	PY	IPA	PY	IPA	PY	IPA	PY	IPA	PY	IPA
Bilabials	b	p	p	p ^h					m	m				
Labio-dentals											f	f		
Dental-alveolars	d	t	t	t ^h	z	ts	c	ts ^h	n	n	s	s	l	l
Retroflexes					zh	tʂ	ch	tʂ ^h			sh	ʂ	r	ɻ
Palatals					j	tɕ	q	tɕ ^h			x	ç		
Velars	g	k	k	k ^h					(ng)	(ŋ)	h	χ		

Table 1.1

(Based on Chao (1968) and Li & Thompson (1981))

**Correspondence between Pinyin Symbols and IPA
for Mandarin Finals**

Medial	Ending					
	Open ending	-i	-o/-u	-n	-ng	-r
Row-a	-i a e	ai ei	ao ou	an en	ang eng ong	er
Row-i	i ia ie	iai	iao iu	ian in	inag ing iong	
Row-u	u ua uo	uai ui		uan un	uang ueng	
Row -ü	ü üe			üan ün		

Table 1.2-1 (in Pinyin)

Medial	Ending					
	Open ending	-i	-o / -u	-n	-ŋ	-r
Row-a	z, f A ɤ	ai ei	au ou	an ən	aŋ əŋ oŋ	ɛr
Row-i	i iA iɛ	iai	iau iou	ien in	iaŋ iŋ ioŋ	
Row-u	u uA uɤ	uai uei		uan uən	uaŋ uəŋ	
Row -ü	ÿ ÿɛ			ÿan ÿn		

Table 1.2-2 (in IPA)

(Based on Chao (1968) and Li & Thompson (1981))

Chapter 2

Speech Errors: An Overview

2.1 Introduction

Speech production involves the transformation of a speaker's speech intention to a specific language format. In normal speech, however, this transformation process is often far from perfect. People often make speech errors, also known as slips of the tongue. Speech errors can be defined as speech utterances which deviate from the speaker's speech intention; that is, what is said differs from what is intended. Speech errors do not occur randomly, but tend to follow certain patterns and show specific rules of speech formation. Therefore, speech errors have been an important source of evidence for speech researchers who wish to gain some insight into the actual processes of speech production.

Speech error analysis has become an important part of linguistic and psychological research, with the past few decades seeing an explosion of interest in the study of speech errors. A number of different psycholinguistic models have been proposed to account for different aspects of this phenomenon in fields as diverse as linguistics, psychology, neurology, physiology, sociology, communication, and cognitive science. Although the study of speech errors has been largely dominated by

Western linguistic theories based on error data from European languages, the study of speech errors has begun to involve other languages. Speech error studies in non-European languages contribute to further verification of linguistic theories which typically base production models on evidence from European languages. This ever-increasing body of speech error data collected from diverse languages forces linguists and cognitive scientists to review old theories, as well as develop new theories and analytical practices. A brief review of the history of research work done in this area is necessary to provide an overview of scholarly developments in the study of speech errors. Thus, this chapter reviews the general history of studies in speech error analysis and the different assumptions that speech production models have made about the mechanisms which support natural language.

2.2 Speech Errors: A Historical Review

Linguists started collecting and analyzing errors in speech as far back as the eighth century (see Fromkin 1988). Studies of speech errors that resulted in scholarly publications began more than twelve centuries ago, when the Arab linguist Al-Kisa'i wrote his *Errors of the Populace* (see Anwar 1979; Fromkin 1988). Al-Kisa'i described speech errors of different kinds in the Arabic world, and since then, other descriptions of speech errors have been written by Arab grammarians, especially during the medieval period. A number of these medieval studies described incorrect usage by non-native speakers of Arabic or speakers of the non-standard dialect, using the term "error"; in so doing, they reveal how grammarians of the period recorded, analyzed and classified a wide variety of errors of speech.

Although there is no such early record for speech errors in European languages, certain types of speech errors in English were reported as early as the sixteenth century for rhetorical purposes (Fromkin 1973a). Around the turn of the twentieth century, Mr. William Spooner made himself famous for a particular kind of lapse in both spoken and written forms that come to be known as "Spoonerisms" (see Potter 1980). But Spoonerisms were utilized long before Spooner's time for the purpose of showing a speaker's "pungent wit." Fromkin (1971) notes that speech errors like *I must goe dye a beggar* for *I must goe buy a dagger* were found in Henry Peacham's *Compleat gentleman*, published in 1622.

Speech error analysis as a serious study began in Europe and North America in the late nineteenth century. In 1895, Meringer and Mayer published what is considered "the first major psycholinguistic analysis of linguistic errors, together with a corpus of over 8000 illustrative errors" (Fromkin 1980). Summarizing previous research on slips of the tongue as evidence of language change, Meringer, a linguist at the University of Vienna, then collected and analyzed his own speech error data in German. Around the same period, Freud's (1901) *The Psychopathology of Everyday Life* was also published, and included a psychological treatment of speech errors. These classical works on speech errors laid the foundation for later research on speech production.

With the development of psycholinguistic studies, the last few decades have seen a growing interest in the study of speech errors, and a large body of literature now examines speech errors in a variety of languages. In 1982, Cutler's *Speech Errors: A Classified Bibliography* shows that 82% of the entire inventory (258 items out of 315) was published after 1950, and 223 since 1970. This does not count the sizable number of books and papers that appeared during and after the preparation of

the bibliography (see Fromkin 1988). Since Cutler's classified bibliography was published, the study of speech errors has proceeded on a much wider scale. However, errors have been extensively reported and catalogued primarily for European languages, e.g., German (Meringer & Mayer 1895), Dutch (Nootboom 1969), and English (Fromkin 1971). Only a limited number of non-European languages have been the subject of error analysis. But the range of languages covered still does not provide enough scope to support the universalistic claims about speech errors in all languages. More efforts are needed to collect evidence from more languages to support such claims. So far, the findings about speech errors in Thai (Gandour 1977), Japanese (Nihei 1986), and Hindi (Ohala & Ohala 1988) suggest that speakers of these languages make errors in ways different from speakers of European languages.

Speech error studies of Chinese began relatively late. Although the use of jokes, puns, and language games that involve the intended selection of wrong or improper words has been recorded throughout history, this speech phenomenon was not given serious attention. Certain types of error-like speech patterns in Chinese (which are similar to common English speech error patterns like *haplology* and *ellipses*) began to appear in major publications only a few decades ago: they were described not as errors, but as special types of speech patterns (see Chao 1968). More recent scholars interested in speech error studies (e.g., Zhang 1990, Moser 1991, Shen 1992, Shao 1993, Yang 1994, 1995) have shown evidence that speech errors in Chinese occur in ways similar to their counterparts in languages such as English, hence lending some support to the general assumption of linguistic universality (see Chomsky 1991). Although the research methods applied in most Chinese error studies are greatly influenced by Western theories, traditional analyses of Chinese grammatical structures still play an important part in charting the specific characteristics of the Chinese language. The past few years have seen growing

interest among Chinese and Western scholars in the collection and analysis of Chinese errors. But before this dissertation, little has been available to Western scholarship about this aspect of Chinese psycholinguistics.

2.3 Different Schools of Speech Error Analysis

Scholars from different disciplines tend to look at the phenomenon of speech errors from the perspectives they derive from the different approaches in their particular discipline. Historically, there have been two main reasons for studying errors, and these correlate with linguistic and psychological interests. Linguists are interested in the information that speech errors provide about linguistic units and linguistic rules. This is because speech errors, though produced by a mistake of some kind, still largely follow the phonological and grammatical principles in a given language. For example, the phrase “slip of the tongue” in English is most unlikely to be uttered as “tlip of the sung” because this violates a rule of English phonotactics which says that a word cannot begin with a /tl/ cluster.

Psychologists are interested because speech errors often involve a particular speech environment which may influence the speaker’s general psychological and cognitive state. Therefore, speech errors can provide evidence for the psychological processes of speech production, and this has always been of interest to psychologists. Thus, different disciplines adopt different approaches to the study of speech errors, and focus on different aspects of speech production. Historically, therefore, there have been two schools in speech error studies: the Meringer school that focuses on linguistic aspects of speech errors, and the Freudian school that focuses on the psychological state of the speaker.

2.3.1 Meringer School

Meringer, with his representative work on speech errors (Meringer & Mayer 1895), is often considered the “father” of the linguistic tradition in speech error analysis (see Fromkin 1971). Although he was not the first to be interested in what slips of the tongue might reveal about the nature of language and language change, his published analysis of over 8000 German errors attempted to find the internal rules of language structure that govern the process of language production and language perception. Meringer was among the first to suggest that an examination of speech errors might reveal natural causes for certain types of linguistic change. The basic assumption in Meringer’s approach was that disturbances in speaking, manifested in a slip of the tongue, are caused by the influence of another component of the same speech stream: by an anticipatory sound, by a perseveration, or by another semantic formulation of the ideas contained within the context. Meringer also discounted psychological factors as having any influence in the normal speech production process.

2.3.2 Freudian School

Sigmund Freud also studied errors, but he did this in order to discover psychological mechanisms in the course of speech production. In 1901, Freud first popularized the suggestion that verbal slips may provide insights to cognitive processing, and linguists and psycholinguists have examined slips of the tongue for such insights ever since. Freud’s (1901) basic assumption was that “disturbances of speech may be the result of complicated psychical influences”, and “could result from influences outside this word, sentence or context, and arise out of elements

which are not intended to be uttered and of whose excitation we only learn precisely through the actual disturbance” (56).

Freud claimed that verbal slips are instigated by the global state of the speaker, and that linguistic factors do not influence the outcome of the errors. Therefore, verbal slips were seen as a manifestation of a speaker’s cognitive state, semantically related to the cognitive state, determined by personality and situational influences, and independent of the cognition associated with the speaker’s intended utterance. Thus, semantic influences that are independent of the speaker’s intended utterance create a distorted utterance, such that the verbal slip resembles the semantic meaning of the interference more closely than the meaning of the originally intended verbal output (Motley 1980).

Scholarly differences between the Meringer and Freudian schools, though somewhat acrimonious in their time, have become a non-issue in modern research. Research since Meringer and Freud’s time has discounted Freud’s original notion of influence by global cognitive states. Few would argue in favor of Freud’s claim that all speech errors, except for some of the simplest cases of anticipation and perseveration, could be explained as being caused by the speaker’s unconscious thoughts and repressive mechanisms. However, while most error researchers today focus on the linguistic factors that cause verbal slips, there are still scholars (e.g., Motley 1980, 1985) who experimentally test the role of repressed desires and fears in the etiology of speech errors. Although this line of research receives less attention now, some postulate coexisting streams of thought, whereby unintended thoughts interfere with those intended to be expressed. Most psychologists’ work, however, has been concerned with the syntactic, lexical and phonological processes intervening between the thought plan and speech (see Butterworth 1980a).

2.4 Representative Studies and Speech Production Models

Whether the aim is to discover linguistic rules or to uncover the speaker's psychological state, speech error researchers have attempted to provide a general picture of the speech production process. Some give most attention to the collection, either observational or experimental, and classification of error data, as well as to the linguistic analysis of the interrelationship between errors and their targets in the speech production process (e.g., Fromkin 1971, 1973b; Cutler 1980, 1988; Garrett 1975, 1980a, 1988; Stemberger 1985; Fay 1980). Others pursue the analysis of pauses in normal speech, intending to discover a uniform pause and error strategy for speaker's timing patterns in spontaneous speech (e.g., Butterworth 1980b). Still others attempt to chart the secret of the mental organization of linguistic components through the discussion of "Freudian slips" (e.g., Ellis 1980; Motley 1980, 1985; Baars 1980b, 1992c; Birnbaum & Collins 1992). More recent studies have shown attention to the analyses of errors in terms of the neurological structure of the speaker's brain (e.g., Fromkin 1991).

As a result, a number of different language production models have been suggested over the years. For instance, in the 1970s, Shattuck-Hufnagel and Garrett provided the outline of a processing model of sentence production, using speech errors as their primary data. Shattuck-Hufnagel (1979) introduced the notion of a frame-and-slot model in which linguistic segments are selected to fill independently computed slots. Garrett's (1975, 1988) "functional/positional level" processing model has been quite influential, dividing the speech production process into two major independent stages at which grammatical encoding and pre-articulatory

positioning of speech segments take place separately. Dell's (1986) "spreading activation theory" and Stemberger's (1985) "interactive activation model" have also been challenging, asserting that the activation in speech production spreads in both ways (both top-down and bottom-up) through the different stages in a non-linear pattern. Levelt (1989, 1992) and Bock & Levelt (1994) propose evidence that shows that while activation takes place during the lexical process, phonological encoding strictly follows lexical selection, but not the other way round. Work by Levelt and colleagues therefore supports the basic principles incorporated in Garrett's two-stage model.

In what follows, I briefly review the major contributions of influential scholars in the field of speech error analysis who have applied different methods to the study of speech production process, and who have posited useful models of speech production.

2.4.1 Victoria Fromkin

Most of the credit for modern interest in slips of the tongue belongs to Victoria Fromkin of the University of California at Los Angeles, who in the 1960s began to document the verbal slips in everyday speech. Over the years, Fromkin and her colleagues have collected a large number of examples of verbal slips in English, and later they established a database for errors in other languages as well. Fromkin's published works (1971, 1973a, 1973b, 1980, 1988, 1991) shed light on the underlying structure of linguistic performance and continue to broaden the general scope of error research.

Speech errors illustrated in Fromkin (1971) are used to show the reality of phonological units and rules. Fromkin states that her interest “is rather in how particular errors shed light on the underlying units of linguistic performance, and on the production of speech” (1971: 29). Discussing error examples from her own data, Fromkin illustrates that there are discrete units at different levels of performance which can be substituted, omitted, transposed, or added. It is impossible to describe the grammars of languages without such units, which in itself shows the need of postulating these units in a theory of grammar. Fromkin argues that although the error data from speech behaviors may not necessarily validate hypotheses about linguistic competence, they are certainly sufficient to suggest such verification. Since errors are also believed to result from the misapplication of linguistic rules, they serve as a testing ground for whether the theoretical concepts that linguists propose as realized in postulated rules of grammar are matched in the way that units are altered, exchanged, or lost.

Units that are affected in speech errors in Fromkin’s data involve segments, morphemes, or words. A segment can be a vowel, a consonant, a consonant cluster, or a phonetic feature. In Fromkin’s (1971) words, “by far the largest percentage of speech errors of all kinds show substitution, transposition (metathesis), omission, or addition of segments of the size of a phone ... both within words and across word boundaries” (30). Fromkin illustrates the following types of speech errors:

Anticipation, where a later segment in the same utterance is anticipated, and therefore occurs in an earlier position.

- (1) a. *cup of coffee* → *cuff of coffee*
b. *week long race* → *reek long race*

Perseveration, where an earlier segment perseverates or is repeated in a position later in the utterance.

- (2) a. *Chomsky and Halle* → *Chomsky and Challe*
 b. *irreplaceable* → *irrepraceable*

Metathesis (Spoonerism), where two different segments in an utterance exchange position.

- (3) a. *turn the corner* → *torn the kerner*
 b. *less young* → *yes lung*

Cluster errors, where consonant clusters can be wrongly produced in any of the above-mentioned manners, either as a sequence or as discrete segments.

- (4) a. *brake fluid* → *blake fruid*
 b. *split pea soup* → *plit spea soup*

Stress errors, where stress is misplaced or moved in an utterance.

- (5) a. *altérnately*—*altérnatively*—*no*—*áternately*
 b. *opâcity and specificity* → *opâcity and spêcify*

Syntactic word class errors, where utterances involve exchange or misplacement of lexical items from the same syntactic word class resulting in syntactically ill-formed sentences.

- (6) a. *bottom of page five* → *bottle of page five*
 b. *infinitive clauses* → *infinity clauses*

Semantic errors, where items with related semantic features are wrongly selected in the utterance, which may sometimes result in a non-existent blended word.

- (7) a. *I really like to*—*hate to get up in the morning*
 b. *the oral*—*written exam*
 c. *mainly/mostly* → *[mownlij]*—*[mejstlij]*

In each type of error, Fromkin gives a detailed analysis which shows that these seemingly random occurrences reflect the non-random underlying linguistic rules. The analysis even shows that units smaller than a phone, i.e., distinctive features of speech sounds, also constitute independent elements in the production of speech. For example, an error like the following shows evidence of a change of the value of the phonetic features involved.

(8) *bang the nail* → *mang the mail*

In example (8), there is a switch between two phonetic features. The consonant /b/ of *bang* has the phonetic features [-nasal, +anterior, -coronal], but it switches to /m/ which has the feature [+nasal]. Similarly, the phoneme /n/ of *nail* switches from [+coronal, -bilabial] to [-coronal, +bilabial] to become /m/. This /b/ to /m/ change (*bang* → *mang*) could be caused by the anticipation of the feature of nasality of the following segment /n/. This changes the phoneme /m/ and then further perseverates over to a following segment, causing the /n/ to /m/ change (*nail* → *mail*) in the utterance. Another explanation is that the feature [+bilabial] of /b/ in *bang* is perseverated and the feature [+nasal] of /n/ in *nail* is anticipated. The two features partially switch positions in the course of speech production, hence the error.

In speech generation, there is a hierarchy of units with different sizes. Fromkin suggests that the segments in an utterance occur in a linear order, and this linear ordering may be disrupted. Since the discrete segments are specified by actual physiological properties, some of these properties may also get misordered, or attached to other segments. In discussing larger segments like syllables and words, Fromkin further asserts that segmental errors obey a structural law with regard to syllable-place; that is, initial segments in the origin syllable replace initial segments in the target syllable, nuclear segments replace nuclear segments, and final segments

replace final segments. Since phonological or phonetic specifications, semantic features, and syntactic word-class features can all be involved in speech errors in the course of speech production, it is obvious that lexical items must be stored with such features indicated. With this assumption in mind, Fromkin (1971) proposes a five-stage model of speech production where linear order of processing events is assumed to take place inside the speaker's "utterance generator" in the following simplified stages:

- Stage 1.** A meaning to be conveyed is generated.
- Stage 2.** The meaning is structured syntactically, with semantic features associated with parts of the syntactic structure.
- Stage 3.** The output of Stage 2 is thus a syntactic structure with semantic and syntactic features specified for the word slot, and the position of the primary stress is indicated at this stage.
- Stage 4.** Feature/value matching in the over-all vocabulary for the specified words.
- Stage 5.** Automatic phonetic and phonological rules take over, converting the sequences of segments into actual neuro-motor commands to the muscles in the articulation of the utterance.

This speech production model shows a possible ordering of the processing events in the course of speech production, and attempts to account for non-deviant utterances, as well as erroneous utterances in speech. The basic premise is that speech production is a linearly ordered process in which a meaning to be conveyed is syntactically and semantically structured, phonologically specified, and matched up with the appropriate vocabulary, before being articulated as the final speech output. Although this model has been modified after criticism by other scholars because it

seems to emphasize the movement of linguistic units over the cognitive processes behind such movements, it was quite influential in early speech production research.

2.4.2 Merrill Garrett

Merrill Garrett (1975, 1980a, 1980b, 1988, 1992) emphasizes processing mechanisms in speech production. Garrett favors systematic observation of spontaneous speech, believing that observational studies of spontaneous language production, both normal and disturbed, provide a complementary strategy to direct experimentation. Garrett also believes that speech production is an ordered process, but unlike Fromkin, Garrett divides the stage Fromkin terms *utterance generation* into two major stages: a *functional* stage and a *positional* stage. Garrett observes that utterances often fail to contain intended elements, or contain elements which are mislocated or not intended. For Garrett, sound exchanges and word exchanges are different in nature, and indicate that sentence production is conducted at two different levels. The following examples from Garrett (1980a) illustrate the difference between word exchange and sound exchange.

- (9) a. *I left the cigar in my briefcase* → *I left the briefcase in my cigar*
b. *I thought the truck was parked* → *I thought the park was trucked*

As Garrett observes, word exchanges in phrases involve words from the same grammatical category, as in the word exchange between *cigar* and *briefcase* in sentence (9a). This suggests that the speech process is affected by the grammatical properties of the exchanged elements. On the other hand, sound exchanges typically involve words closer together but from different grammatical categories, as in the

exchange between the noun *truck* and the verb *park* in sentence (9b). In cases like (9b), it is possible that the interaction between words yields an exchange error which takes place at a level for which the phrasal membership or grammatical role of a word is irrelevant or simply not yet determined. These two features are clearly related to each other — the likelihood of correspondence of grammatical category is affected by whether the error is phrase internal or not. Garrett suggests that these facts indicate that these exchanges arise at different language processing levels: a *functional level* in which lexical representations and their underlying grammatical relations are constructed; and a *positional level* in which a representation consisting of phonologically specified morphemes is constructed in the order in which they are to be spoken. The two-level assumption explains a number of regularities in speech errors that reflect the fact that word exchanges and sound exchanges have different characteristics.

Errors in Garrett's data have been observed to obey the following constraints:

(a) The interacting elements are metrically and phonetically similar. Sounds which exchange are more likely to be similar in terms of their distinctive feature description than would be expected by chance. Stressed syllables interact with other stressed syllables; but stressed and unstressed syllables do not interact.

(b) The environments of "moved" elements are similar: word initial segments exchange with, copy, or shift to word initial segments, medial segments with medial segments, final segments with final segments. When consonants exchange, they are usually both followed by the same or very similar vowels in the intended utterance.

(c) Phrasal stress and phrasal membership affect the likelihood of any two words contributing to a sound error. In particular, both words in a sound exchange are much more likely than not to be members of the same major phrase.

(d) Well-formedness at the sound level is preserved in errors. When exchanges and shifts occur, they very rarely create sound sequences which violate the phonological conventions of the language being spoken (see Garrett 1980a).

Further explaining the difference between sound and word exchanges, Garrett points out that word exchanges typically occur with words of the same syntactic class. They can occur across a span of several words, and the participating words need not be phonologically similar. In contrast, sound exchanges can involve sounds from words that differ in syntactic class, but the participating sounds are usually close to one another and they are usually phonologically similar. Garrett accounts for these differences by assuming that word exchanges take place at the functional level and sound exchanges at the positional level. This explains the fact that word exchange errors occur over greater distances than sound exchanges (since sound exchanges occur more often within a phrase while word exchanges occur across phrases). Thus, in Garrett's model, the speech mechanism is assumed to produce a sentence by the following stages: (a) "planning frames" are selected for elaboration of the positional level representation; (b) such planning frames are to mark specific phrasal geometry, with inflectional and other grammatical morphemes assumed to be features of that frame; (c) stress contours at least, and possibly more general prosodic features as well, are to be represented in the planning frame; (d) assignment of major category vocabulary items to places in the planning frame is accomplished in terms of descriptive constraints marked at the functional level.

Linking his two-level hypothesis to mainstream linguistic theories in the transformational grammar tradition, Garrett states that the functional level is the specifically linguistic level, and is the natural correspondent of deep structure. with the positional level corresponding to surface structure.

2.4.3 Michael Motley

If Fromkin and Garrett can be considered scholars in the Meringer tradition in that they focus more on the linguistic regularities of the collected error data. Motley (1980, 1985), in contrast, is more the Freudian scholar in studying speech errors from a psychological point of view. Motley and others (e.g., Baars 1980b; Motley & Baars 1979; Motley, Camden & Baars 1979) have conducted experiments the results of which partially support Freud's claim that semantic influences independent of a speaker's intended utterance induce verbal slips which are closer in meaning to those semantic influences than to the originally intended utterance. Recall that Freud (1901, 1924) first popularized the suggestion that verbal slips may provide insights to cognitive processing in that verbal slips are instigated by the general cognitive state of the speaker. Freud claimed that verbal slips are specifically related to a cognitive state determined by personality and situational influences, and may be independent of the cognitions associated with the speaker's intended utterance. Motley's laboratory-generated slips allow replicable investigation of the potential of semantic factors and cognitive state to influence verbal slips. Although in agreement that linguistic factors do play a prominent role in the observed speech errors, Motley believes that a speaker's psychological state can indeed lead to verbal slips. Motley (1985) gives a very simple example which may recall Freud's argument.

Several years ago, in the course of being interviewed for a job, I was introduced to a competitor for the position. Extending my hand and meaning to say, "Pleased to meet you," I accidentally said, "Pleased to beat you." (116)

Motley believes that Freud's hypothesis about the speaker's "global state" can be tested. Motley's experimental protocol induced subjects to make slips in a way that controls the anxieties or motivations that subjects are experiencing. In one of Motley's experiments, for example, undergraduate male subjects were warned that they would receive an electric shock from electrodes attached to the body. No shocks were given, but subjects' anxiety levels elicited spoonerisms related to electricity, such as *cursed wattage* for *worst cottage*, *damn shock* for *sham dock*. In another experiment involving subjects' sexual anxiety, the presence of a provocatively dressed woman experimenter monitoring the test elicited spoonerisms with sexual content, such as *fast passion* for *past fashion*, *bare shoulders* for *share boulders*, and *happy sex* for *sappy hex*. The outcome of these experiments was in line with Freud's claims about speech errors arising from the concurrent action of two different intentions. One is to convey the meaning the speaker consciously wishes to convey, the other is the disturbing intention which interferes with the conscious purpose. The outcome of this conflict is a speech error.

Note that the elicited errors in Motley's experiments are mostly spoonerisms. Linguistic factors affect spoonerism frequencies. Spoonerisms increase according to the lexical legitimacy of the error, independent of the lexical characteristics of their targets. Motley points out that cognitive processing precedes the subject's eventual articulation and involves not only the consideration of the target, but also the evaluation of its recoded (spoonerized) phoneme sequence. For example, subjects provided with an equal number of semantically well-formed targets (e.g., *long root*)

versus phonologically matched targets (e.g., *lawn roof*) will produce a significantly greater number of slips on those targets that allow lexically legitimate spoonerisms (e.g., *long root* → *wrong loot* vs. *lawn roof* → *rawn loof*). Favoring *wrong loot* over *rawn loof* can only be explained by subjects considering the spoonerized version of the targets prior to articulation, and evaluating the corresponding phoneme sequences by applying the criterion of lexical legitimacy in a “prearticulatory editing process” (see Motley 1980). The editing mechanism evaluates the available phoneme-sequence options, approving for articulation the sequence which fits its editing criteria. Thus, many natural verbal slips might result from this stage of pre-articulatory editing approval.

Given a pre-articulatory editing model, Freud’s prediction of cognitive set influences upon verbal slip outcomes may be approached as a prediction of semantic criteria operating within the speaker’s mental editor. Edited phoneme sequences are evaluated not only on the basis of phonotactic and lexical legitimacy (they should be allowed by phonotactic rules and should be legitimate words in the lexicon), but also on the basis of their semantic legitimacy (they should make sense in a semantically well-formed sentence). A speech error always tends to be an utterance that is linguistically legitimate, that is, slips that form real words are much more common than nonsense words. For example, it is more likely for a given stimulus like *darn bore* to become *barn door* (which is a common noun phrase) than for *dart board* to become *bart doard* (see Motley 1985). Whereas phonotactic and lexical legitimacy are absolute, semantic legitimacy is relative. One might consider the semantic legitimacy of a phoneme sequence in terms of its consonance with its immediate verbal context, or in terms of its consonance with the speaker’s socio-situational context, a more “Freudian” interpretation, or even in terms of its consonance with some aspect of the speaker’s personality.

In general, Motley's studies of speech errors support Freud's notion of verbal slips, but differ in certain important arguments. Whereas Freud would claim that linguistic factors do not influence verbal slips, Motley's experimental studies show that linguistic factors do indeed influence verbal slip outcomes. Whereas Freud would claim that all verbal slips are semantic manifestations of a speaker's internal cognitive-affective state, Motley's study finds that semantic and phonological legitimacy may sometimes determine the nature of an error rather than the speaker's global state. Motley's position is that the more direct cause of verbal slips is "noise and interference" in the phonological encoding process, with the associations provided by cognitive set and verbal context serving merely as reference information for the semantic phase of pre-articulatory editing.

2.4.4 David Fay

David Fay (1980) was among the first to apply Chomsky's early (1957, 1975) transformational theory to the analysis of speech errors. Fay believes that an account of the relation between a grammar and mental processes in an utterance should be at the heart of any theory of speech production. Unlike other error researchers who look for evidence to link speech behaviors with linguistic units (such as a phoneme, a syllable, a word, or a phrase), Fay focuses his interest on the transformational rules through which units are put together to create acceptable utterances. If a speech production device applies transformational rules to an underlying sentence structure during speech, rule application will take place in several steps. Consequently, speech errors could be found at any of these steps, should any of the transformational rules be misapplied. An erroneous sentence like (10) involves misapplication of the transformational rules, as illustrated in Fay (1980) below.

(10) *Why are you an oaf sometimes?* → **Why do you be an oaf sometimes?*

Transformational process:

Q <i>you</i> PRES <i>be an oaf sometimes</i> WHY	Underlying Structure
WHY <i>you</i> PRES <i>be an oaf sometimes</i>	WH-Fronting
WHY PRES <i>you be an oaf sometimes</i>	*Subject Auxiliary Inversion
WHY <i>do</i> +PRES <i>you be an oaf sometimes</i>	Do-Support
<i>Why do you be an oaf sometimes?</i>	Morphophonemics

The transformational rule for Subject Auxiliary Inversion (SAI) is misapplied in (10) (as marked with an asterisk) and fails to move the Verb along with the tense marker to the left of the subject NP, hence the error.

Fay's hypothesis explains a number of sentential errors found in English. But the hypothesis that utterances are indeed constructed through such transformations is matched by countless counter-examples that cannot be explained by the transformational hypothesis. Fay himself admits that, although some evidence supports the transformational approach to sentence construction, there are better ways that account for speech production without using transformation rules.

2.4.5 Joseph Stemberger

A more recent hypothesis about processing mechanisms comes from Stemberger (1985), who argues for an interactive model of language production. Stemberger postulates two distinct elements in the cognitive system: *units* and *links*. Units are simple points that merely sum activation from various sources, and in turn

send out activation to other units. Links are the interconnections between different units and between different levels within an organized net of the language system. The basic driving force of the system is interactive stimulation. Activation, a measure of the activity of a given unit, spreads from one unit to another, but the amount of activation force may vary among different units. Highly activated units have strong effects on other units, while less activated units do not. In addition to links that pass activation, there are links that inhibit other units, in the sense of negative activation. Once the target unit is activated, it gets more and more activation force ("the rich get richer" principle), and it inhibits other units from being further activated so as to guarantee access to the right lexical items in sentence production.

According to this model, the language production process begins when the speaker formulates a speech intention about what to convey in an utterance. Going through the language information stored in the memory system, the speech intention activates a set of semantic and pragmatic units at a high level (e.g., speech planning level), and these units in turn send the right amount of activation to access a target set of units at lower levels which matches the speech intention in phonological and morphological terms. However, the activation is passed to all units that are associated with the target word. For example, the target word *feather* may activate other phonologically or semantically associated words, such as *favor*, *leather*, *hair*, *leaf*, which may in turn activate still other items that are associated with them (see Stemberger 1985). This is where inhibition plays a role in decreasing the activation level of the receiving unit. If the word *feather* gets more activation force than others, it will inhibit all other activated words from being further activated and decrease their possibility of reaching the level at which they might be articulated.

In the course of lexical selection, there are units with similar amounts of activation force due to different syntactic structures and phonological or semantic similarity effects. These effects can sometimes influence the speaker's normal activation process, leading to speech errors of different kinds. The following examples from Stemberger (1985) serve to demonstrate the point.

- (11) a. *Looking at the next box* → *looking at the next boss*
 b. *Your tongue is all red* → *Your teeth are all red*
 c. *If you're hungry* → *If you're hunger --hungry*
 d. *It has a pretty nice flavor/taste* → *It has a pretty nice flaste*
 e. *That is true of most cities* → *Most cities are true of that*

Example (11a) shows the phonological relation between two activated units (*box* vs. *boss*), while example (11b) shows how two activated items are semantically related (*tongue* vs. *teeth*). The similarity between two activated items can be both at semantic and phonological levels at the same time, as demonstrated in (11c) (*hungry* vs. *hunger*). Semantically associated items can also be blended into one unit in an error, as in example *flavor/taste* → *flaste* in (11d). Interactive activation can also take place at the syntactical level where different syntactic structures conflate to affect the final speech output, as the example *That is true of most cities* → *Most cities are true of that* in (11e) above.

In contrast to Garrett's (1975) assertion that sentence production undergoes separate stages in a functional-to-positional-level direction, Stemberger believes that the interactive activation between units goes in both directions. For instance, an abstract grammatical structure at the functional level may determine what lexical item is selected from the lexicon, but the selection of a wrong lexical item can also

affect the syntactic structure of a planned sentence. Note that in most errors that involve syntactic accommodation, the verb agrees in number and person with the NP that erroneously appears in subject position, as in the *is* → *are* change in (11b) and (11e) above, indicating that phrase structure rules can generate only structures where the subject NP and the verb agree in person and number. Activation from phonological and morphological levels can trigger the adjustment of such syntactic rules.

2.4.6 Willem Levelt

Analyzing and synthesizing the different speech production models from different error researchers, Levelt (1989, 1992; also Bock & Levelt 1994) proposes a comprehensive schema of language production. While in agreement with Stemberger that activation in speech production plays an important role, Levelt clearly distinguishes the two individual steps of lexical selection and phonological encoding in the course of speech production, in support of Garrett's functional/positional two-stage model. Levelt believes that Morton's (1969) logogen theory is still significant in today's "theoretical battleground". The logogen theory assumes that the mental lexicon is comprised of a collection of logogens, each sensitive to its own specific information which stems from the cognitive system. The logogen becomes activated by semantic information relevant to the target word. When the activation exceeds some threshold value, the logogen fires, and sends the phonological code of its word to a "response buffer", from which an overt articulatory response can be initiated. The logogen's activation to threshold is semantic in nature, and the logogen's firing and the preparation of response execution is phonological in nature. As Levelt (1992) points out, such a two-step approach to lexical access is common to all modern views

of lexical access, no matter in what speech production model. Hence, Levelt divides the whole lexical process into two steps: lexical selection (retrieving the one appropriate word from among thousands of alternatives) and phonological encoding (computing the phonetic shape from the selected item's phonological code or form specification as it is stored in the mental lexicon).

Discussing matters of lexical selection, Levelt (1989, 1992) provides a broader view of speech production. In order to reveal some communicative intention, the speaker has to conceptualize the intention, and encode a preverbal message to express that intention. But the choice of message is a very subtle function of the relation between the speaker and the listener. For instance, one's dog can be represented by different terms like 'my baby', 'my headache', or simply 'the animal', depending on the context and the relation between the speaker and the dog referred to. These choices have an immediate impact on lexical selection. The preverbal message is a conceptual structure, which forms the input to a formulator, whose task is to map the message onto linguistic form. Its final output is a phonetic plan that can be executed by the articulatory motor system.

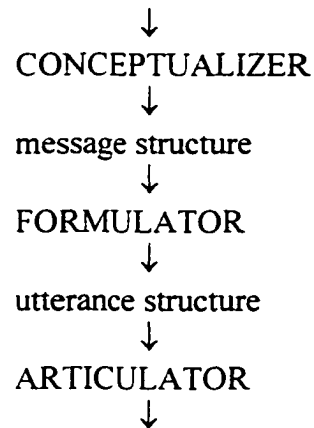
As Levelt (1992) further explains, lexical selection drives grammatical encoding, which is part of the processing function inside what he calls a *formulator*. Grammatical encoding takes a message as input, retrieves lexical items from the mental lexicon, and delivers a surface structure as output. A surface structure is a hierarchical organization of syntactic phrases, in which the lexical items are semantically and syntactically specified. Such syntactic specification involves category and subcategorization information and all other syntactical relations between the lexical items in the surface structure. Syntactic procedures are triggered when semantic conditions are met in the message. Different orders of lexical

selection (e.g., whether a subject noun or an object noun is selected first for the sentence structure) can lead to vastly different syntactic constructions.

Note that lexical selection results in a surface structure that is semantically and syntactically specified, but it is unspecified for phonological form. Therefore, phonological encoding is a natural step to follow. Phonological encoding is the second phase of lexical access in speech production. A word's phonetic form is not a ready-made template that can be retrieved as a whole. As Levelt (1992) explains, an error such as *feel like playing* → *peel like flaying* reveals that a word's skeleton can be specified independently from the segments that have to fill it. The fact that the speaker did not say *eel* for *feel*, or *laying* for *playing* in the erroneous sentence suggests that there was already an active word skeleton requiring an onset consonant. It is therefore possible that a word's skeleton or frame and its segmental content are independently generated. Talking is mapping discrete linguistic representation onto pronounceable and continuous phonetic units. The construction of frames serves the purpose of creating a pronounceable metrical pattern for the utterance as a whole. The speaker produces frames for phonological words, which are metrical units, not lexical units. This is why phonological encoding should be considered an independent phase of lexical retrieval in the course of speech production.

With the major phases of speech production distinguished, Levelt (1989) outlines the blueprint for the speaker, which consists of such components as: (1) a *conceptualizer*, which generates preverbal messages whose expression is to realize the speaker's intention; (2) a *formulator* where a grammatical encoder retrieves lexical items and generates grammatical relations reflecting the conceptual relations in the message, and a phonological encoder creates a phonetic plan and incorporates procedures for generating the prosody of an utterance; (3) an *articulator* which

unfolds and executes the phonetic plan as a series of neuromuscular instructions, the result of which yields overt speech. Levelt's speech production schema is summarized by Bierwisch & Schreuder (1992) as the following:



(Fig.2.1)

In normal speech production, as Bierwisch & Schreuder (1992) explain, the conceptualizer takes in perceptual, motoric, emotional, psychological, and contextual information, and computes it into a message structure which is grammatically organized by the formulator. The formulator operates on the linguistic elements; these are lexical items, and their properties and relations which are related by linguistic rules. The result is a well-formulated utterance structure to be further processed by the articulator. This schema resembles previously proposed speech production models (e.g., Fromkin's (1971) *utterance generator*), but it is significantly different in that it takes non-linguistic factors into consideration. On the other hand, it leaves the major task in language production to the formulator which transforms message structures into utterance structures.

Levelt's schema matches Garrett's two-stage speech production model, in that his schema clearly marks the distinction between the functional level (from conceptualization to formulation) and the positional level (from formulation to articulation). For example, the process of conceptualizing different information into message structures requires the interaction of both linguistic and non-linguistic knowledge. The formulator functions to invoke linguistic rules to process the message structures. If any information is wrongly processed at this stage, such as the wrong selection of lexical items, or misapplication of syntactic or semantic rules, errors will occur at this functional level. On the other hand, after the formulator has finished transforming the message structure into utterance structure, it places the retrieved lexical items, with their specified phonological features, into the right position of an utterance. The articulator then verbalizes the utterance structure into well-formed speech output. Anything that goes wrong within this stage (e.g., the misordering of words, syllables, phonemes, or stress and tones) will result in speech errors at the positional level.

The various studies of speech errors and the various models of speech production that I have covered in this section largely account for the different types of speech errors in normal speech. Each has strong points, but all such speech production models are predominantly based on error data from English. Whether these models can account for speech errors in other languages, assuming that speech errors occur in all known human languages, remains to be verified. The following will introduce the few studies which have focused on the study of speech errors in Chinese.

2.5 *Studies of Chinese speech errors*

Studies of Chinese speech errors did not begin until less than a decade ago, when Chinese scholars (e.g., Zhang 1990, Shen 1992) began to collect and analyze errors from spontaneous speech. Traditional Chinese grammarians (e.g., Chao 1968) have long noticed some “special patterns” in spoken Chinese, such as “inversion”, “transposition”, “repetition”, “omission” or “addition” (see Shi 1985). But these special spoken patterns are classified not as deviation from speech intentions, but as special types of colloquial sentence structures which are governed by special syntactic and pragmatic rules. For example, Chao (1968) recorded from actual speech elliptical sentences, such as *tade yongren shi ge riben nüren* 他的用人是个日本女人 ‘His servant is a Japanese woman’ → *ta shi ge riben nüren* 他是个日本女人 ‘He is a Japanese woman,’ *wode qianbi bi nide jian* 我的铅笔比你的尖 ‘My pencil is sharper than yours’ → *wo bi ni jian* 我比你尖 ‘I am sharper than you’ and described them only as “a looseness of subject-predicate relation” (70), since they are comprehensible in the appropriate speech context.

Psycholinguistics was first introduced into Chinese linguistic circles in mainland China with Gui’s (1985) *Psycholinguistics*, in which the phenomenon of speech errors in normal speech was briefly addressed, but no examples of real Chinese errors were provided. It was not until Zhang’s (1990) dissertation in *Speech errors and language production* that systematic collection and analysis of speech errors in Chinese began as an individual field of research. The following section briefly describes the different research methods applied by Chinese scholars in speech error studies.

2.5.1 Zhang Ning

Zhang's (1990) *Speech errors and language production* is the first Ph.D. dissertation in mainland China to discuss speech errors in Chinese in relation to speech production models. Unlike Gui (1985), who provides his readers with information about the different aspects of psycholinguistic studies in Western linguistic circles, Zhang concentrates on speech errors in Chinese, their classification, and how the speech production models proposed by Western linguists can account for the speech errors in Chinese. Briefly reviewing the speech production models posed by Laver (1980), Fromkin (1971) and Dell & Reich (1980), Zhang illustrates and analyzes the different types of speech errors in Chinese according to the error categories found in English. Summarizing and comparing the strong and weak points of previous speech production models, Zhang proposes her own 4-stage, 25-step speech production mechanism, which she believes will explain the production process not only for "ideal" normal speech, but also for normal error-laden speech.

Zhang describes speech production as going through 4 stages: a semantic programming stage, a grammatical programming stage, an articulation stage, and an articulation monitoring stage. There are different steps within each stage, and a misoperation in any step at any stage will cause an error of some type. Zhang gives detailed explanations of how speech is produced in her model, using her own speech error examples as illustration. For example, word blending errors like *shuiguo* 水果 'fruit' / *shipin* 食品 'food' → *shuipin* 水产品, substitute errors like *mei weikou* 没胃口 'have no appetite' → *mei duzi* 没肚子 'have no stomach' are considered errors at the stage of "speech programming" (steps 5-11), where different lexical items interfere with each other in the process of word selection. Phonological errors such as /tèwu/

特务 ‘spy’ → /tóuwu/ and /shǒudū júshì/ 首都局势 ‘situation in capital’ → /shǒudū júshì/ do not occur at the same stage, but rather at the stage of “articulation”, because the errors and the corresponding errors are “phonologically too close” (Zhang 1990).

Although the model does not differ much from the revised standard model described in Dell & Reich (1980), this is the first speech production model that is proposed to account for normal speech and speech errors in the Chinese language. Zhang’s Chinese error data set was small, just about a hundred examples, but it marks the beginning of speech error studies in Chinese and the development of Chinese psycholinguistics.

2.5.2 David Moser

The study of Chinese speech errors has attracted Western linguists as well. Error researchers such as Fromkin, Shattuck-Hufnagel, and Stemberger (personal communication) have long been interested in a corpus of Chinese error data to complement their cross-linguistic error research. But no work on Chinese speech error appeared in the West until Moser’s *Slips of the tongue and pen in Chinese* was published in a 1991 volume of *Sino-Platonic Papers*. This first publication has been, until now, considered “the most complete coverage” of Chinese errors known to Western linguistic circles (Richard Sproat, personal communication). Moser notes that it is a pity that “so far there have been so few dedicated Chinese ‘entomologists’ who have undertaken to collect and analyze these linguistic ‘insects’..... [and] virtually no systematic psycholinguistic research on errors has been done in Chinese” (Moser 1991: 1). Moser obviously did not know about Zhang’s (1990) work in China, since the dissertation was not published then, and was obviously unaware of

the research on speech errors in Chinese being conducted in China around that time (see Shen 1992). But Moser's remarks about the rarity of such research on Chinese errors certainly call for more work in this field.

Moser proposes no model of speech production. His 100 or so examples of slips of the tongue and pen in Chinese show language-specific characteristics of Chinese, both in its syntactic and phonological structures and in its writing system. His data are classified into categories such as anticipation, perseveration, blends, exchange, substitution, and haplology, very reminiscent of the error patterns presented in Fromkin's (1971) classification. Moser does, however, discuss how language production mechanisms that can produce errors in speech can also lead to written errors. For example, the anticipation phenomenon in speech may also be found in one's writing, both at the semantic and logographic levels. The following two examples are provided by Moser to illustrate the point.

(12) 一双 → *二双
'one pair'

(13) 提心吊胆叶 → 担心吊胆
'to be on pins and needles'

In example (12), Moser explains, the change from 一 'one' to 二 'two' implies a single cause by the anticipation of the following character 双 'pair', which involves a reduplication of the part 又. The "doubling command" for 双 was anticipated when the person was writing 一 'one', hence 一 'one' got reduplicated as 二 'two'. Also, the semantic value of 双 'pair, two' is anticipated, causing the writer to write 二 'two' instead of the target character 一 'one'. In example (13), the right part 旦 in the word 胆 'liver' is anticipated when the person is writing the character 提 'lift',

changing the character into the erroneous 担 'carry'. Note again that the first two characters of the actual output (担心 'to be worried') also match the meaning of the target, suggesting that semantics also plays a part in slips of the pen. This example raises doubt about Hotopf's (1983) claims that the programming of conversion of words in storage buffer to their graphological forms is usually done no more than one word ahead. The items involved in the written error (提 and 担) are four words apart in (13). Moser's analysis on written errors in Chinese is unique and thoughtful.

Although there has been work on the study of slips of the pen in English (e.g., Potter 1980), Moser was among the first to discuss slips of the pen in Chinese. However, Moser does not clearly indicate whether the slips of the tongue/pen he collected were from native Chinese speakers or from learners of Chinese as a second/foreign language like himself. Non-native Chinese speakers who are learning the language tend to make errors of all kinds, both in speaking and writing, and these errors only show the speaker/writer's incompetence in the target language.

2.5.3 Shen Jiaxuan

A group of Chinese scholars at the Language Center of the Chinese Academy of Social Sciences in Beijing has also been working on the collection and analysis of Chinese speech errors. Their results led to the publication of Shen's (1992) *kou wu lei li* 口误类例 'Illustrated classification of speech errors'. This fact certainly challenges Moser's statement that "virtually no systematic psycholinguistic research has been done in Chinese". Shen Jiaxuan, a leading member of this group of Chinese psycholinguists, does agree, however, with Moser that speech error studies in non-

European languages are yet to be further developed, and that such studies in Chinese are extremely rare.

Over a period of three years, Shen, with the help of family and colleagues, as well as governmental support, collected over seven hundred speech errors in Chinese from conversations at home, the workplace, and radio and TV programming. Shen (1992) notes that his error corpus continues to grow steadily, as the research project is a continuous one. Unlike most Western scholars who analyze speech errors using mostly English or German examples, and from there predict a universal pattern of speech errors. Shen's classification of speech errors is more in accordance with traditional Chinese grammar and better shows the special characteristics of the Chinese language. For example, a Chinese syllable is traditionally considered a combination of an *initial* and a *final* (see Chao, 1968), and thus Shen classifies errors of anticipation, perseveration, or metathesis in terms of the misplacement of the traditional Chinese syllable segments of initials and finals.

Chinese tones in speech errors were also extensively discussed in this work. In his data, tones are independent components that can be involved in different variations and placement in observed errors. Shen also proposed the different steps in the speech production process in which an error occurs. Although no new model is proposed by Shen, his Chinese error data collection and classification remain a valuable contribution to Chinese psycholinguistics.

Nevertheless, Shen's analysis of the speech errors in his collection is basically limited to phonology and semantics, mainly discussing how an error in speech differs from its target in terms of Chinese phonological rules and semantic well-formedness. Most of the errors discussed involve only a sound segment in a

word, or the semantic similarity between an error and its target. There is not much discussion of errors that involve syntactic structures of a sentence in which errors occur, or misapplication of certain syntactic rules of Chinese grammar. Nor is there any discussion about the psychological “why” and “how” behind the errors discussed in Shen’s paper.

2.5.4 Shao Jingmin

Shao (1993) is a Chinese linguist who follows traditional Chinese methods in literary criticism. With a focus on language performance in written literature rather than on anything spoken, even in the collection of error data, Shao engages in a Chinese psycholinguistic study from a very different angle. Although Shao’s discussion of “slips of the tongue” does not follow the mainstream study of speech errors in the Western psycholinguistic sense, it provides a view of speech production from a literary perspective, showing how literature-orientated scholars analyze speech errors in written works of literature.

For Shao, communication in real-time speech is different from that in written language, because the latter allows the writer to think, to reconsider, and to correct what is going to be expressed. More errors tend to occur in oral communication than in written communication. Due to the emphasis in traditional research on *language* over *speech* in Chinese linguistic circles, much more attention has been given to “stative studies” than “dynamic studies”, resulting in the fact that little research is done on such a common phenomenon as speech errors. Therefore, Shao attempts to introduce this relatively neglected field by trying to discover and explain the special characteristics of speech errors in Chinese. Interestingly, Shao does not seem to

venture out of the restricted circle of “stative studies”, since most of the error data discussed in his paper are collected from conversations between characters in the written literature of novels, theater dramas, and movie scripts.

Shao’s (1993) classification of speech errors is dramatically different from that of Western scholars. Shao analyzes his errors in terms of *form* and *content*. When looking at the form of errors, he classifies speech errors into two kinds: *intended errors* and *non-intended errors*. Intended errors are produced for the purpose of creating some artistic effect on the part of the listener. This is the first paper to introduce jokes into psycholinguistic discussions of speech errors, and the basic principles of sentence and discourse structure as linked to listeners’ expectations, as well as the techniques for using speech errors to entertain speakers. Once people realize the internal rules and regulations of speech, and the effect they can bring to the audience, errors can indeed be turned into “treasures”.

The second class of speech errors, the non-intended ones, are further classified into *noticed errors* (the errors that are immediately noticed after their occurrence) and the *unnoticed errors*. Within the noticed errors, some are about to be uttered, but are adjusted before the error is actually realized by the listener; others are fully produced, and are corrected afterwards. Utterances that involve noticed errors usually exhibit three special features: pauses, hesitation, and repetition, features which are also given notice of in the findings on English errors (see also Butterworth 1980b).

In terms of the content of speech errors, Shao’s classification offers three categories which are different from those often referred to in the literature: (1) non-standard speech; (2) semantic inappropriateness; and (3) contextual inappropriate-

ness. Non-standard speech includes utterances that are phonologically, lexically and syntactically different from what is considered standard Mandarin. For example, a speaker with a Cantonese accent may say /xì/ (系) 'yes' instead of the standard /shì/ (是), which, according to Shao, is an error. Since non-standard speech is a common phenomenon in the multi-dialectal Chinese community, considering it as "erroneous" purposely increases the scope of discussion about errors, because many native Chinese speakers speak the language with a certain accent. Considering the large variety of Chinese accents, each featuring its own specific phonological, semantic and lexical rules, Shao's classification counts as errors utterances which are otherwise quite normal in a certain communicative context.

Following traditional analytic methods in Chinese literary works, Shao discusses "semantic inappropriateness" from the point of view of rhetorical and literary criticism (rather than that of linguistics). For example, Shao categorizes the following as "metaphorical errors": *xifu* 媳妇 'wife' for *nüpengyou* 女朋友 'girl-friend', *gaosu* 告诉 'to tell' for *shangliang* 商量 'to discuss'. This is because in wrongly introducing one's 'girl-friend' as one's 'wife', the speaker reveals his psychological state of anticipating the marriage. The difference between *gaosu* 'to tell' and *shangliang* 'to discuss' lies in the degree of politeness of the speaker. Using such metaphorical errors may help the writer describe the psychological state of a character. In discussing "contextual errors", Shao associates errors with the speaker or listener's social status, as well as with the time and place of the speech act. For example, addressing a manager by his first name on a formal occasion is contextually incorrect, and an immediate correction is necessary. Shao's error categories also include such literary-based terms as *modification*, *inserted explanation*, *illustrative addition*, *negative addition*, and *justification* (see Shao 1993), giving the impression that Shao is discussing a piece of literature rather than individual speech utterances.

Such analysis is technically literary-based, and obviously differs from the mainstream psycholinguistic studies. Therefore, Shao's analysis of his "speech errors" is limited to "stative studies", suggesting that speakers in written literature make similar kinds of speech errors as people in real life. Shao's analysis shows the awareness in Chinese literature circles of the relations between a speaker's psychological activity and the appropriate speech context in the course of speech production. Though different in many ways from Western research methodology, Shao's view of speech errors represents the interests of traditional Chinese scholars in the relationship between linguistic performance and literary description.

2.6 Summary

The phenomenon of speech errors has attracted serious attention from scholars of different disciplines, and the historical development of speech error studies has resulted in the emergence of different speech production models to account for error occurrence in normal speech. The focus of linguists when studying speech errors is on the language-internal rules of natural languages, while psychologists are more interested in what light errors can shed on the relationship between speech errors and the speaker's psychological stages and the immediate speech environment. Whether a particular model explains the speech production process better than other models is an important question, but whether such a model can account for speech error phenomena cross-linguistically is another issue. Researchers should take both factors into consideration. Although traditional error researchers have mostly based their analyses on error data from Indo-European languages, recent literature has provided error data and analysis from non-European languages. The question of whether the different speech production models proposed

so far can account for all errors in all languages can only be answered by more studies of more languages.

In the chapters to follow, I will discuss a variety of speech errors in Chinese from linguistic, cognitive, and social-cultural points of view. A general classification and analysis of these errors will show the language-specific characteristics of the Chinese language that influence the speech production process in Chinese in ways that are both similar across languages and unique in its own course, and therefore shape theoretical models of speech production universally.

Chapter 3

General Classification and Analysis

3.1 Introduction

Error research has been particularly fascinating to linguists and psychologists in the past few decades, in that speech errors are a rich source of information about speech production that is not available in normal speech. An increasing body of literature and more error data in different languages have appeared, making possible better cross-linguistic analyses and a better understanding of language production processes in general. However, most analyses are based on error data collected in Indo-European languages, and different language production models have been proposed to account for the different types of errors that are largely found in these languages. Questions arise as to whether such error analyses also account for speech errors in non-European languages such as Chinese. Although very little has been done in the study of speech errors in Chinese, an increasing number of scholars have begun to show more and more interest in such studies (see Zhang 1990, Moser 1991, Shen 1992, Shao 1993, Yang 1994, 1995), and there have been contributions to Chinese psycholinguistics in the area of language production theories.

Cross-linguistically, the speech error data used for analysis so far have been collected either through observation in real-time speech or through lab experiments. But all errors collected fall basically into a few categories (see Fromkin 1971, for an early example). The discussion and analyses of speech error data in different languages have shown that there is striking cross-linguistic similarity in terms of error patterns, suggesting that speakers of different languages follow similar processing stages in speech production. Although error studies have not been reported for all known languages, it is generally believed that errors occur universally. As Fromkin (personal communication) points out, "as far as researchers working with speech errors can tell, speakers in every language produce such errors – deviations from their target utterances. Making errors has little to do with the language". Making a wide cross-linguistic comparison to test the universality of speech behavior is beyond the scope of this dissertation, but working on Chinese errors in comparison with those that are well discussed in English can test such claims about universality. It can also test theoretical implications of speech production models and uncover language specifics in terms of individual speech processing stages.

So far, analyses of speech errors in Chinese have shown that most of the error categories that have been extensively discussed in English have Chinese counterparts. My own data collection, though still small in size, shows that Chinese errors can be classified in ways similar to those found in English. Speech errors generally occur at such linguistic levels as phonology, syntax, and semantics. Although errors can be attributed to many non-linguistic factors, the deviation between the error and the target can usually be measured in terms of traditional linguistic units, such as a phrase, a word, a syllable, a phoneme, or a phonetic feature. This chapter gives a general classification of speech errors in Chinese at the

phonological, syntactic, and semantic levels. Although errors in Chinese appear in much the same patterns as do those in English, much needs to be done to discover the language-specific characteristics of the Chinese language errors. The discussion and analysis of these errors in Chinese aim at a further discovery of the similarity and difference between the speech production process in Chinese and other languages.

3.2 The phonological aspects of speech errors

Historically, most error analyses are phonologically-based. Since the turn of this century, error researchers (e.g., Hockett 1967; Boomer & Laver 1968; Nootboom 1969; Fromkin 1971) have found that speech errors show a mis-ordering of units in free speech. Although different scholars have used different terms for errors of different kinds, the fact remains clear that mis-ordered units (including those of anticipation, perseveration, exchange, omission or substitution) can be segments, morphemes, words, phonetic features, or some combination of phonemes in chunks larger or smaller than a syllable. My data show that speech errors in Chinese behave in much the same way as English speech errors, in that a Chinese error can involve all the different linguistic units at different levels (e.g., a word, and syllable, a phoneme, a tone, a phonetic feature) within the language structure of Chinese. Much like errors in English that still sound like English, erroneous utterances in Chinese are usually formed with the legitimate sounds or sound features within the language's phonetic inventory, rather than any random sound that is outside of the phonological system of the language. For instance, the Chinese palatal sounds /j/, /q/ and /x/ are not likely to be produced by English speakers in an error, while /θ/ and /ð/ sounds are unlikely to occur in Chinese utterances, even in errors.

Before launching into a detailed discussion of phonological errors of any type, it is necessary to give a brief phonological sketch of Chinese phonological structures. Note that the term Chinese here stands for Mandarin Chinese. Traditionally, it is generally believed that Chinese is a language in which all morphemes are monosyllabic, and that each monosyllabic morpheme is symbolized by one written character. According to Chao (1968), traditional Chinese phonology divides the syllable into an *initial* (I) and a *final* (F). The initial (or the onset) is the way the syllable begins, usually with a consonant, such as /m/ in *mai* 买 'buy', /t/ in *tian* 天 'sky'. A small number of syllables (such as *ai* 爱 'love', *er* 儿 'son') that do not begin with a consonant are said to begin with a *zero initial*. The final of a syllable (or the rhyme) is the syllable minus initial, such as /-ian/ in *tian* 'sky' and /-ai/ in *mai* 'buy'. This initial-final division can be shown in the following.

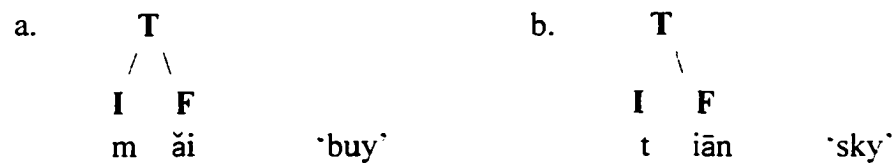


(Fig. 3.1)

In addition to an initial and a final, each Mandarin syllable carries one of the four different tones that distinguishes this particular syllable from others both phonologically and semantically.¹ The four Mandarin tones have different pitch values: the first tone has the value of HHH (where *H* stands for 'high'), the second tone has that of MMH (where *M* stands for 'medium'), the third, LLM (where *L*

¹ In the Romanized *pinyin* spelling system, a tone marker is applied above the nuclear vowel of a stressed syllable to indicate whether the syllable carries a first, second, third, or fourth tone. For example, the tone marker 'ˇ' above /-a-/ in *mǎi* 'buy' indicates that the syllable carries a third tone. Similarly, the marker 'ˊ' above /-a-/ in *tiān* 'sky' indicates that this syllable carries a first tone.

stands for ‘low’) and the fourth tone has the pitch value of HML (see Lin 1992, 1996). As noted in Chao (1968), the tone begins with the initial and spreads over the whole syllable if the initial is voiced (as in **Fig. 3.2-a**, where T(one) is linked with both the voiced initial /m-/ and the final /ai/), and tone spreading is restricted to the final only if the initial is voiceless (as in **Fig. 3.2-b**, where T is linked only with the final /-ian/ but not the initial /t-/). In other words, tones are attached to the voiced phonemes in a syllable (Chao 1968: 19).



(Fig. 3.2)

This syllable structure has long been used to describe the formation of sounds in many Chinese dialects, including the secret languages in Chinese, also referred to as *fanqie* language formation (see Chao 1968, and Bao 1990).² Although this traditional linear approach to describing the Chinese syllable structure has been challenged by more recently developed autosegmental phonology theories (see Goldsmith 1979, Marantz 1982, Yip 1980, Bao 1990b, Lin 1992), many Chinese scholars today still use such a syllable structure to describe phonological behaviors in speech error analysis (see Shen 1992). A typical syllable structure in Mandarin

However, in discussions where tones are not involved, for the sake of clarity, tone markers are not provided.

² *Fanqie* is a method developed fourteen centuries ago by Lu Fayan in his *Qieyun* to specify the pronunciation of a particular character. To describe a novel syllable (or a character), the process takes two other known characters, one with the same initial and the other with the same final as the syllable to be glossed. For example, the word *huang* ‘deserted’ is given as *hu* ‘call’ plus *guang* ‘light’. In a reverse process, *fanqie* language formation in some Chinese secret languages splits one known syllable into two parts (initial and final) and combines the original initial with a new final, the original final with a new initial. For example, *ma* ‘mother’ is given as *may* -*ka* (see Chao 1968: Bao 1990a).

Chinese would contain an initial or a syllable onset (usually a consonant (C) or a glide (G), zero initials are mostly pronounced with either a glottal stop or a pure vocalic beginning) and a final (typically containing a vowel (V) or a “V-cluster”, such as /ai/ in the above example). A consonant cannot occur at the end position of a syllable, except for the two nasal consonants /n/ and /ŋ/,³ and an occasional /r/ in northern dialects. This syllable structure is different from that of English in that there are no consonant clusters in Chinese syllables, making it highly unlikely for an error to occur that involves consonant clusters. Nevertheless, the basic error types that are found in English are also found in Chinese.

Speech errors in the phonological domain usually involve a “mismatch” at any level between the utterance and the target in terms of the different speech units or segments, such as a syllable, a phoneme, a phonemic feature, stress and tone. As a common practice, speech errors can be categorized as anticipation, perseveration, metathesis, shift, substitution, blends, haplogy, addition, or omission. Examples from my data collection may illustrate the different types of errors in Chinese.

3.2.1 Anticipation

In the course of speech production, one segment at a later position in the planned utterance interferes with or replaces another segment at an earlier position of the same utterance. The result of such an interference or intrusion is an error that involves the *anticipation* of some following sound. An English example of such an error is Fromkin’s (1971) *a Canadian from Toronto* → *a Tanadian from Toronto*, where the syllable-initial consonant /t/ of *Toronto* is anticipated and brought forward

³ The *pinyin* symbols used in Chinese phonological representation are different from IPA symbols. Some single consonants are represented by a combination of two symbols in *pinyin* system.

to an earlier position. The Chinese examples given below show the same speech behavior where the intended speech (the target) is produced erroneously (as indicated by the arrow). For the sake of clarity, both the intended and the mispronounced segments are underlined>.

- | | |
|--|--------------------------------------|
| (1) <u>chūn</u> <u>qiū</u> <u>dà</u> <u>mèng</u> 春秋大梦
'big spring-autumn dream' | → qūn qiū dà mèng |
| (2) <u>lín</u> <u>shí</u> <u>hù</u> <u>kǒu</u> 临时户口
'temporary residence card' | → lín shú hù kǒu |
| (3) <u>qián</u> <u>bù</u> <u>jiǔ</u> <u>cái</u> <u>zhī</u> <u>dào</u> 前不久才知道
'didn't know until not long ago' | → qián bù <u>zhī</u> jiǔ cái zhī dào |
| (4) <u>biǎo</u> <u>tiáo</u> <u>le</u> <u>ma</u> 表调了吗
'is the watch adjusted?' | → <u>diǎo</u> tiáo le ma |

The anticipated segment in an error can be a syllable-initial consonant (like the /q/ of *qiu* in (1)), a final or a rhyme (as /u/ of *hu* in (2) is anticipated, causing /shi/ to become /shu/), or a whole syllable (such as /zhi/ in (3)). Quite often, an anticipated segment in an utterance can be as small as a phonetic feature. In (4), it is the feature [+alveolar] of the segment /t/ in *tiao* that is anticipated, replacing the feature [+bilabial] of the target segment /b/ in *biao*, other features being unchanged, including the feature of [-aspirated].

Shen (1992) gives a more detailed classification for Chinese errors of the anticipation type. In his data, he finds that the anticipated segment in an utterance can be an initial, a final, a syllable with tone, a syllable without tone, a tone alone, a monosyllabic word, or a polysyllabic word or phrase. In my analysis, an error

such as [ŋg] (*pinyin*) vs. [ŋ] (IPA). The correspondences between the two are listed at the end of Chapter One.

involving a speech unit that is larger than a word will be considered to be an error of either the syntactical type or semantic type (which will be discussed in later sections). since the movement or replacement of a whole word or larger chunks of speech segments involves a processing stage which differs from that for the processing of individual phonemes in a sentence (see Garrett 1980a).

3.2.2 Perseveration

An error of *perseveration* refers to the speech phenomenon where a speech segment at an earlier position interferes with or entirely replaces another segment at a later position. That is, the interference or the influence of a sound perseveres, or is carried onward to the position of a following sound. An English example is Fromkin's (1971) *gave the boy* → *gave the goy*, where the velar consonant /g/ of the word *gave* is brought to the position of the consonant /b/ of the word *boy*. In the Chinese examples below, the perseverated segment, like the anticipated segments, can be a syllable initial (such as the /q/ of *qing* in (5)), or a rhyme (such as /a/ of *da* in (6)), or the whole syllable (such as *hong* in (7)), or a feature (such as the feature [-retroflex] of the sound /s/ in (8)).

- | | |
|--|-------------------------|
| (5) hěn qīng xián 很清闲
'very leisurely' | → hěn qīng qián |
| (6) jiědá le hěn duō wèntí 解答很多问题
'answered many questions' | → jiědá le hěn dā wèntí |
| (7) fěnhóng fènghuāng 粉红凤凰
'a pinkish red phoenix' | → fěnhóng hòngfāng |
| (8) sìshí 四十
'forty' | → sì sí |

Note that one perseverated segment can sometimes cause the perseveration of another segment. Take (7) for example. After the perseveration of the syllable /hong/ occurs, taking over the following syllable slot for /feng/, the initial consonant /f/ of the replaced syllable /feng/ is in turn perseverated to the next syllable, causing /huang/ to become /fang/. This is an interesting chain reaction in the process of speech production. Similarly, the perseverated speech unit can be what I call "a feature pattern", which means that the error involves the perseveration of the pattern of a group of syllables rather than an individual phoneme in a particular syllable. Yang (1994) describes the following error example in a Chinese tongue twister.

(9) shí shì shí, sì shì sì 十是十, 四是四 → shí shì shí, sì sì sì
 'ten is ten, four is four'

Example (9) is a two-phrase sentence with the first phrase having three retroflexed initials. The second phrase has a mixture of both retroflexed and non-retroflexed initials, other features being the same. If the retroflexed feature of /sh/ is called A while the non-retroflexed feature of /s/ is called B, then the initials of (9) form the pattern AAA BAB. As described in Kupin's (1982) discussion on English tongue-twisters (e.g., *She sells seashells*), speakers tend to follow a pattern, or generalize one pattern to match another. Similarly, the Chinese example (9) involves a pattern change from AAA BAB to AAA BBB. Therefore, the perseverated speech unit in example (9) is not just a feature, but the entire sound pattern of the phrase. It also suggests that speakers tend to generalize (or be primed by) a pattern from what is processed earlier and apply this pattern in what is going to be processed. Hence the perseveration.

Anticipation and perseveration seem to be speech behaviors in which certain speech segments are reduplicated or moved either forward or backward. Thus, there

is segment movement (or segment duplication) of the same nature, but in opposite directions. The anticipatory or perseverant segments vary between larger speech units (such as a whole lexical item) and smaller ones (such as phonemic features) as shown above. But sometimes it is not easy to tell whether an erroneous segment in an utterance should be categorized as anticipation or perseveration. Such an ambiguity is illustrated in examples (10) and (11) below.

- (10) wǎng jiā dǎ diàn huà → wǎng jiā diǎ diàn huà
 往家打电话
 `make a call home`
- (11) gēn māo gǒu yíyàng → gēn gāo gǒu yíyàng
 跟猫狗一样
 `same as cats and dogs`

In these examples, it is hard to determine whether the /a/ to /ia/ change in (10) is the result of anticipation of the following syllable /dian/ or the perseveration of the previous syllable /jia/, since both syllables have the rhyme containing /ia/, which may trigger the error. Similarly, the change from /mao/ to /gao/ in (11) can be influenced by either the anticipation of the /gou/ or perseveration of /gen/, both of which start with the voiced glottal stop /g/. However, such errors are less common than those that show unambiguous sources of the slip (e.g., an error either caused by a following segment, hence anticipation, or by a preceding segment, hence perseveration). In my data, the number of ambiguous errors is much less than that of unambiguous errors of the anticipation or perseveration type, since such errors occur only in an utterance where two source syllables both contain one particular segment which is accommodated in a third syllable in-between.

Speech errors of these types seem to suggest two further points. Firstly, the majority of the misplaced segments are influenced by the source segments in the

adjacent syllables or adjacent words. This may indicate that when a sentence is phonologically processed, the articulatory system receives the order to pronounce a certain segment long before (at least one syllable ahead of) its articulation (hence the anticipation), and the effect of this order lasts after the target segment has been produced (hence the perseveration). That is, the commands for the articulation of two or more segments in a sentence can overlap, interfering with the phonological realization of adjacent segments. This interference causes phonological errors of anticipation or perseveration types, as well as errors of sound exchange (which will be discussed in the following section). Secondly, speakers tend to generate a sound pattern for a group of adjacent segments. Such patterning practice can assimilate one segment with two or more segments that are phonologically identical to each other in adjacent syllables or words and have stronger priming effect, particularly when the affected segment is placed between two identical segments which combine both anticipation and perseveration effects (as demonstrated in (9) through (11)). Such assimilation effect gets weaker when the identical segments are farther apart because it is difficult to pattern larger chunks of utterance.

3.2.3 Metathesis

Errors of *metathesis* (or *exchange*) occur when two segments in an utterance exchange positions. Such errors have been well-discussed in English, an example of which is Fromkin's (1971) *left hemisphere* → *heft lemisphere*. The exchanged segments are usually from the same phonological domain (e.g., initial for initial, final for final, and syllable for syllable), but they are not necessarily from the same grammatical category (e.g., noun for noun, or verb for verb). Examples (12) through (16) show some Chinese errors of the exchange type.

- (12) zhè shāfā tǐng dà 这沙发挺大 → zhè fāshā tǐng dà
 ‘this sofa is big’
- (13) nǐ bǎ tuōbù tóu le ma? 你把拖布投了吗 → nǐ bǎ tōubù tuó le ma?
 ‘did you rinse the mop?’
- (14) rénmin yínháng 人民银行 → yínmin rénháng
 ‘people’s bank’
- (15) liù jí liánxù jù 六集连续剧 → liù jí liánxì jù
 ‘six-act TV play’
- (16) qù jiāo fèi 去交费 → qù fèi jiāo
 ‘go to pay the fee’

The examples above show that speech errors of metathesis involve the exchange of phonological segments of different kinds. Example (12) is an exchange of two syllable initials (or onsets) /sh/ and /f/ within the word *shafa* ‘sofa’. Example (13) involves the exchange of two different rhymes (the rhyme of the first syllable /uo/ in *tuobu* ‘mop’ and the rhyme /ou/ of the verb *tou* ‘to rinse’). Note that at this point it is hard to determine if the exchanged segments in (12) and (13) are a part of a syllable or the whole syllable, since the segments involved have the same rhyme (/a/ of /sha/ and /fa/ in (12)) or the same syllable onset (/t/ of /tuo/ and /tou/ in (13)). Example (14) involves the exchange of two syllables from two different words (/ren/ of *renmin* ‘people’ and /yin/ of *yinhang* ‘bank’). Although the /r/ sound being replaced by /y/ is not uncommon among speakers of certain dialects,⁴ the speaker of (14) is certainly aware of the /r/ sound and is able to pronounce it in *renhang*, indicating that the utterance of *yinmin* is an error rather than a dialectal behavior.

⁴ In certain dialects in north China (e.g., Yantai, Wendeng, Dalian), some speakers tend to utter the retroflexed /r/ sound as the palatal /y/ sound (e.g., *re* ‘hot’ becomes *ye*, *rou* ‘meat’ becomes *you*). Such dialectal or individual variations cannot be considered errors since that which is produced is what is intended as the correct pronunciation.

Speech errors may sometimes occur in ambiguous patterns and can have more than one explanation. Example (15) contains an exchange between the second syllable /ji/ and the last syllable /ju/,⁵ or only the rhymes of the two syllables (/i/ and /u/) are exchanged, but it also involves a change of fourth syllable /xu/ into /xi/. There must be an error of another kind that is involved here. There could be at least three explanations for this error combination. The first explanation is that /ji/ and /ju/ are exchanged (resulting in *liu ju lian xu ji* from the target *liu ji lianxu ju*), then /i/ in *ji* at the last syllable position is anticipated in its preceding syllable /xu/, causing /xu/ to become /xi/. Another possibility is that the rhymes /i/ of *ji* and /u/ of *xu* exchanged position (resulting in *liu ju lian xi ju*) before the /i/ of *xi* is perseverated to the rhyme position of the following syllable /ju/, causing it to become /ji/. The third explanation considers the error to be a double exchange between the rhyme /i/ of *ji* and the rhyme /u/ of both *xu* and *ju*, resulting in the erroneous *liu ju lian xi ji*. Furthermore, the error may also have involved the pattern change (as discussed earlier) from ABCDD (-iu -i -ian -ü -ü) to ADCBB (-iu -ü -ian -i -i). Such errors involve the movement of the segments /i/ and /u/ which are in many cases considered glides (when they are placed between the onset and the nuclear vowel in a syllable). The movement of glides has been a special topic in quite a few studies (e.g., Shen 1992), since the movement or changes of these glides may reveal some insights into the much discussed Chinese syllabic structures (see Chapter 4).

Example (16) involves the exchange of two syllables which are also two different words. The syllable /jiao/ has the grammatical function of a verb (meaning 'to hand in, to submit') and the syllable /fei/ that of a noun (meaning 'fee'). The

⁵ The final in the syllables /ju/ and /xu/ is underlyingly /ü/ which is spelled in *pinyin* without the umlaut after palatal fricatives. This is because the appearance of the umlaut is predictable. Therefore, the umlaut appears over /u/ only after /j/ and /n/ (e.g., /lü/, /nü/) to distinguish from /lu/ and /nu/. I use /u/ here instead of /ü/ in the discussion of this section for the sake of simplicity.

exchanges between phonetic segments in errors are limited by linguistic constraints. As can be seen, syllable onsets are exchanged only with onsets (e.g., /sh/ is exchanged with /f/ in (12)); rhymes are exchanged with other rhymes (e.g., /uo/ is exchanged with /ou/ in (13)); but there are never exchanges between the onset of one syllable and the rhyme of another syllable. Speech errors do not appear in random combinations of phonetic segments. They are pronounceable, well-formed syllables that sound like real words in a language, but they are unintended, and thus diverge from their targets.

The exchanged units at the syllable level seem to be either sound exchanges (e.g., (13), (14)) or word exchanges (e.g., (16)), since many Chinese words are monosyllabic. Word exchanges in English tend to involve items of the same grammatical category (e.g., a noun for a noun, a verb for a verb) (see, for example, Garrett 1975, 1980). This is also true in Chinese (see **Appendix: Lexical exchange**). But the exchanged syllables in Chinese are often difficult to categorize as to whether they are sound or word exchanges because of the monosyllabic nature of Chinese words. For example, the exchanged items *jiao* 'to submit' (a verb) and *fei* 'fees' (a noun) are of different grammatical categories. However, exchanges of monosyllabic units are more likely sound exchanges, for the exchanged units tend to be closer to each other than exchanged words, and they switch positions regardless of their part of speech in the sentence. It is generally believed that a mistakenly selected word always or nearly always belongs to the same word class as the intended word: that is, when words are switched, nouns transpose with nouns, verbs with verbs (see Nooteboom 1969, Fromkin 1971, Garrett 1975). When individual words are exchanged, they tend to keep the completeness of the morphological and semantic structure of the words, regardless of the number of syllables they have. This indicates that the grammatical structure of the sentence under active construction imposes

restrictions on the selection of words in the course of grammatical encoding (Levelt 1989). When individual sounds are exchanged, the number of syllables of the exchanged sounds are usually the same. Garrett (1975, 1980) regards the distinction between sound and word exchanges as important and believes that they take place at different processing levels. It is therefore necessary to make clear what are the switched units in an error to determine at what level the error has occurred.

If it is not clear whether the exchanged elements in example (16) are exchanged sounds⁶ or entire words (since they are both monosyllabic), (17) and (18) below may be better examples to show the point.

- | | | |
|------|---|---|
| (17) | zhè <u>huā</u> shì <u>xiāng</u> de bu 这花是香的不?
'Is this flower fragrant?' | → *zhè <u>xiāng</u> shì <u>huā</u> de bu
这香是花的不? |
| (18) | yuè shì gùxiāng míng 月是故乡明
'The moon is brighter in the hometown' | → *gù shì yuè xiāng míng
故是月乡明 |

In (17), the second underlined word *xiangde* 'fragrant' is a disyllabic adjective, but the whole word does not move to be exchanged with the monosyllabic noun *hua* 'flower'. Only the monosyllabic /xiang/ moves to be exchanged with another monosyllable /hua/. The monosyllabic noun *yue* 'the moon' in (18) exchanges position with only one syllable of the disyllabic noun *guxiang* 'hometown', further indicating that it is only individual sounds (or individual phonological units inside different words) that are exchanged, but not whole words. It is therefore suggested that some apparent word exchange errors should be considered sound exchanges in Chinese. This is partially due to the fact that many Chinese words, regardless of their

⁶ In contrast to word errors that involve misordering of complete words in a sentence, sound errors refer to the misordering of individual phonological units (e.g., phonemes or syllables) with or

word class, are monosyllabic, making it possible for unintended phonological segments to form legitimate words of different grammatical classifications. Speech errors that involve exchanges of complete lexical items will be discussed in Section 3.3.

3.2.4 Substitution

Speech error types such as anticipation, perseveration, and exchange usually show an obvious relatedness between the error and the target. The source segment that influences the production of the target is usually within the context, such as a segment at a later position that is anticipated to occur at an earlier position in the utterance, or two segments in the target sentence that have their positions switched. But there are many errors in which the target is simply replaced by another segment that is not in the target utterance. Furthermore, the error and the target segments often appear to have little similarity both phonologically and semantically. Such a type of error is simply called *substitution* (see Fromkin 1971).

- (19) a. *bízi* 鼻子 'nose' → *pízi* 'leather'
 b. *zhì xiàochuǎn* 治哮喘 'treat asthma' → *zhì qiàochuǎn*
 c. *sǎo dì* 扫地 'sweep the floor' → *cǎo dì*
 d. *hěn kuān* 很宽 'very wide' → *hěn kuāng*

A careful look at the above examples shows that although the source of the substitutes is not within the target sentences, these erroneous segments are often very close to the target in terms of their phonetic features. In (19-a), the segment /b/ of *bizi* 'nose' is substituted by /p/, changing the utterance to /pizi/. Note that /b/ and /p/

without any semantic or syntactic indication. A sound error can involve a syllable that is part of a word or happens to be a word.

share the same phonetic features of manner and place of articulation (e.g., [+stop], [+bilabial]) and differ only in the feature of [±aspiration]. Such substitution shows that /b/ and /p/ are phonetically linked by their phonological similarity and they are easily activated simultaneously in the speech planning process. Similarly, the /xiao/ to /qiao/ change in (19-b) involves the change from the fricative /x/ to an affricate /q/, other features being unchanged. The feature change is also clearly shown in example (19-c), where the dental fricative /s/ is changed to an affricate /c/ with all other features remaining the same.

Phonological substitution can also involve the change of a vowel or a consonant in the syllable-final position. Example (19-d) shows the change from /-n/ in *kuan* to /-ng/ in *kuang*, while other segments in the syllable are not changed. Note that the nasals /n/ and /ng/ are the only two consonants that can occur at the end of a syllable in Mandarin.⁷ Thus the error and the target are indeed closely related. But there are substitutions in which the relation between the error and the target is difficult to determine. For example, the substitution of *guai wan* 拐弯 'to make a turn' by *guai san* does not show clearly the cause of such a change. Phonological relatedness between the segments in the substitution is only one of the explanations, as there are many factors that influence the articulation process, such as morphological, semantic and logographical similarities between lexical items.

Phonological substitution errors involve units larger than a syllable. Since many Chinese words are monosyllabic, substitution of segments larger than a syllable may seem to be word substitution rather than sound substitution. While the

⁷ The nasals /n/ and /ng/ are not clearly distinguished in some dialects, in which case the substitution of one for the other is not considered an error. Only such substitution with no dialectal influence is considered in our discussion.

substitution of a phoneme in a word mostly changes the sound of the target (some consequently change the meaning if the error happens to be a legitimate word but totally out of the context), the substitution of a word (or lexical substitution) often changes both the sound and the meaning of the sentence. Many lexical substitution errors involve words that are semantically related but phonologically totally different from the target (e.g., *shu* ‘tree’ for *hua* ‘flower’, *yan* ‘eye’ for *zui* ‘mouth’) (see **Appendix: Semantic Errors**), but some substituted words may be more phonologically or morphologically related than semantically related to the target, as shown in example (20).

(20) *níyàjiālā pùbù* 尼亚加拉瀑布 → *nījīālāguā pùbù*
 ‘Niagara Falls’ ‘Nicaragua Falls’

In example (20), although the target *niyajiāla* ‘Niagara’ and the substitute *nijialagua* ‘Nicaragua’ share somewhat related semantic features (e.g., names of places located in the Americas), their phonological similarities seem to be more prominent. They both have four syllables three of which are exactly the same (/ni/, /jiā/, /lā/). The nuclear vowels of the syllables in the two competing items fall into exactly the same pattern (/i-a-a-a/). If the target speech unit is substituted by another unit which is phonologically similar and identical in syllable pattern, and this item happens to be an actual word with somewhat related semantic features, such an error seems to be more related to the phonological processing than to lexical selection between semantically related items. An interesting footnote here is that the speaker of this error did not realize that *nijialagua* in Mandarin happens to be a legitimate word ‘Nicaragua’ that represents a country and asked me if it can indeed mean ‘Niagara’ since they sound so much alike. This further suggests that this error has been phonologically driven rather than semantically.

However, different processing routes (phonological, morphological and semantic) reflect the way our mental lexicon is built. This mental lexicon is believed to be organized along principles which reflect the phonological, orthographic, and semantic characteristics that words share (see Emmorey and Fromkin 1988). This assumption explains why certain words (but not others) are more likely to replace the target words in an error of speech. For example, *pay* in English may be more related to words such as *pays*, *paying*, *paid*, *payroll*, *payment* than to *salary*, *check*, or *expenses*.⁸ Similarly, a Chinese word such as *niyajiala* 尼亚加拉 ‘Niagara’ is more likely to be associated with words that share similar phonological or morphological structures, such as *nijialagua* 尼加拉瓜 ‘Nicaragua’ than semantically related items, such as *andalue* 安大略 ‘Ontario’ or *jianada* 加拿大 ‘Canada.’ Phonological relations and semantic relations play different roles at different processing stages. A sound or a word can be substituted by another unit which is either phonologically or semantically related, or sometimes both, depending on at which processing stage the error occurs (the semantic relatedness between an error and the target will be discussed in section 3.4).

3.2.5 Blends

Speech errors of the *blend* type involve a combination of the target speech segment and another segment (which can be a phoneme or a syllable) that are both competing for a single slot during speech production process. Although blends combine independent lexical items with similar semantic features, the behavior of

⁸ Morphology and the study of word formation processes are an important part of speech error analyses. The nature of different types of morphemes and the semantic characteristics of words determine the way lexical items are organized and accessed in the lexicon in the course of speaking, writing and word identification. For further comments on morphology and the mental lexicon, see Kess (1992).

such a ‘sound mixture’ is phonological and morphological in nature. A typical error of this kind contains a part of each of the competing units (though some errors may involve blending of phonological segments in adjacent syllables, such as some errors found of the anticipation or perseveration type). The result can be either an unintended but otherwise meaningful lexical item or a nonsense utterance. For example, in Fromkin’s (1973) error data, a blending of *what/which* leads to the production of a meaningful word *watch* (which is certainly out of context in the case involved). But the blending of *mainly/mostly* simply produced a meaningless non-word *maistly*. I myself have also noted English blending errors such as *samburger* (from ‘sandwich’ and ‘hamburger’) and *troublem* (from ‘trouble’ and ‘problem’).

Speech errors of a similar nature are also found in Chinese, as shown below. I use a slash (/) to separate the two competing targets, and an asterisk (*) to indicate that the blending error is not an actual word.

- | | |
|---|---------------|
| (21) bāozi / jiǎozi 包子/ 饺子
‘steamed/boiled Chinese dumplings’ | → biǎozi |
| (22) diànlíng / diànniǔ 电铃 电钮
‘electric bell/button’ | → *diànliǔ |
| (23) jiāowǎng / jiēchǔ 交往 接触
‘contact/interact’ | → *jiāochǔ |
| (24) dà lóu de duìmiàn / pángbiān
大楼的对面 旁边
‘across/beside the building’ | → ... duìbiān |

Example (21) shows the blending of the first syllable onset /b/ of Target A (*baozi*) and the first rhyme /iao/ of Target B (*jiaozi*), resulting in the production of *biaozi*. The utterance *biaozi* is an actual word (or a word happens to have such

phonological representation) meaning 'prostitute', but it is totally out of context in this case. The speaker of (22) was intending to utter the word for a door bell button in Chinese, and two competing lexical items were activated: *dianling* 'bell' (Target A) and *dianniu* 'button' (Target B). The syllable onset /l/ of *ling* in Target A and the rhyme /iu/ of *niu* in Target B are combined into a new syllable /liu/. The new syllable, however, does not form a meaningful word with the morpheme *dian*. Examples (23) and (24) do not involve blending of individual phonemes, but whole syllables. In (23), the first syllable /jiao/ of the word *jiaowang* 'interact' and the second syllable /chu/ of the word *jiechu* 'contact' are combined to form a new two-syllable utterance *jiaochu*, which is a non-word. Similarly, the syllable /dui/ of the word *duimian* 'opposite side' in (24) is blended with the syllable /bian/ of *pangbian* 'beside', resulting in the utterance *duibian* (a mathematics term *opposite side*). Note that the blending errors involve segments from two competing speech units that are semantically related, which suggests the role that similarity effect plays in the course of speech.

The blended speech segments in an error can be as small as a phonetic feature (such as tones from competing words), or as large as a phrase or a sentence (e.g., *gong bu li po, cheng bu li tuo* 'husband and wife can't be separated, just as a scale and sliding weight are always together' → *gong bu li tuo* 'husband and sliding weight can't be separated'). Although they all show sound or tone changes from their targets, they involve lexical processing at other levels, such as syntactic or semantic interference. For example, when selecting between two competing lexical items, the speaker may combine the sound (the segmental features without any tonal specification in this case) of one item with the tone of another, resulting in a blending of sound and tone. The discussion of tone error in Chinese appears in Chapter 4.

3.2.6 Addition

In the stream of real speech, certain unintended speech units may be added to the target utterance. Since there are no consonant clusters allowed in a Chinese syllable (according to Chao (1968), an aspirated affricate (e.g. /ch/) is the nearest to a consonant cluster) and very few consonants can occur at the syllable final position, the Chinese syllabic structure is simpler than that of English. Hence there are fewer phonemes that can be possibly added to a syllable. For example, it is relatively common to see errors in English such as *understand* → *understrand*, *box* → *blox* (see Fromkin 1973). But it is unlikely to see a consonant added right after another consonant in a Chinese word. Traditionally, Chinese is often referred to as monosyllabic, meaning each word has one and only one syllable. Li & Thompson (1981) have argued that the old notion of word based on the Chinese written characters is arbitrary, and that most Mandarin Chinese words are now polysyllabic, but still it is rare to see a non-compound word in Chinese with more than two or three syllables, while polysyllabic English words such as *irresponsibility* (with 7 syllables) are commonplace. This structural difference is reflected in the fact that it is possible to see errors of syllable addition in English words, such as *similarly* → *similarily* and *computed* → *computated* (see Cutler 1980). There is, however, no possibility for a syllable to be added to an individual Chinese word in an error of this type. Additional vowels can be found in a syllable, and additional syllables can be found in a sentence. The following are a few of the errors of this type from my data.

(25) miànbāo 面包 → miànbǎo
 'bread'

(26) Sānmáo liúlàng jì 三毛流浪记 → Sānmǎo liúlàng jì
 'the wandering of Sanmao'

- (27) yú cì bǐ jiào xiǎo 鱼刺比较小
 'the fish bone is small' → yú cì bǐ jiào shxiǎo
- (28) nǐ zhī bù zhī dào 你知不知道
 'do you know or not' → nǐ zhī bù bù zhī dào
- (29) wǒ qù kàn kàn 我去看看
 'I go and have a look' → wǒ qù kàn kàn kàn kàn

In examples (25) through (29), all the underlined parts in the right hand column are the segments that are added to the planned utterance by mistake. The addition of these segments can be caused by the anticipation or perseveration of another segment in the speech context. The added medial vowel /i/ in *biao* of (25) can be caused by the perseveration of the medial vowel /i/ in the previous syllable /mian/. The added vowel /i/ in *miao* and *liang* in (26) can be seen as the anticipation of the vowel /i/ of the following syllable *liu* and *ji* respectively. The addition of /sh/ in (27) is a rare case in that a normal Chinese syllable does not allow more than one consonant in either syllable-initial position, or syllable-final position. The speech context suggests that this addition is caused by a competing lexical item *shao* 'little'. *Xiao* and *shao* share phonological features (the same rhyme /ao/) and semantic features ('small' vs. 'little'). The error could be the result of the speaker's hesitation in choosing *shao* 'little' or *xiao* 'small'. When the speaker finally decided to use *xiao*, part of the competing word *shao* is already uttered, hence the error *shxiao*. This addition error can also be regarded as a kind of blending between the syllable onset of one lexical item and another competing item that is semantically related. Example (28) involves the addition of an entire syllable /bu/, while example (29) contains the addition (or reduplication) of a reduplicated word *kankan* 'to have a look'. These two examples are errors of syntactic nature (which will be discussed in section 3.3).

3.2.7 Omission

As in errors of addition, speech segments can sometimes be omitted, resulting in speech errors of the *omission* type. As mentioned earlier, Chinese syllabic structure is relatively simple, and there is not much to be omitted from a word, even less from a syllable.

(30) zài jīchǎng dòulióu 在机场逗留 → zài jīchǎng dòulou
 ‘stay at the airport’

(31) sīmǎ guāng zā gāng 司马光砸缸 → sī mǎ gāng zā gāng
 ‘Sima Guang breaks the jar’

(32) xià pǎo le 吓跑了 → xià pǎ le
 ‘scared away’

As can be seen in (30), the word *douliou* ‘stay’ dropped its medial vowel /i/ in the second syllable, resulting in the change of /liou/ to /lou/, which is possibly caused by the perseveration of rhyme /ou/ in the previous syllable /dou/. The medial vowel /u/ of *guang* in (31) is deleted, which could be influenced by the anticipation of the last syllable /gang/.

Example (32) could be an example of perseveration of /a/ in *xia* which replaced the rhyme /ao/ in *pao*, or it caused the deletion of /o/ of *pao*, hence the error *pa*. The omitted segments in these examples seem to be the result of either anticipation or perseveration because the target and a neighboring syllable differ only by the omitted segment, which raises a question as to whether there is indeed errors of the omission type. But the following examples show that omissions are not just a variation perseveration or anticipation.

- (33) lióu diǎnr fèng 留点缝 → ióu diǎn fèng
 'leave (the door) ajar'
- (34) chúfāng 厨房 → chú-āng
 'kitchen'
- (35) bù zhīdào 不知道 → bù dào
 '(I) don't know'
- (36) qù mǎi nèige de dìfāng 去买那个的地方 → qù mǎi nèige dìfāng
 'go to the place where (they) bought that'
- (37) gōng bù lí pó, chènɡ bù lí tuó → gōng bù lí tuó
 公不离婆, 称不离砣
 'husband and wife can't be separated, just as
 scales and sliding weight are always together'

Examples (33) and (34) both involve the deletion of the syllable-initial consonant (/l/ of *liou* and /f/ of *fang*), while example (35) involves deletion of a complete syllable /zhi/ of the word *zhidao* 'know'. The deletion of the segments in these examples could be largely due to the speed effect. It has been reported that speakers experience a speech-accuracy trade-off in normal speech. As pointed out in Baars (1992b), formulating a correct response takes time, and a more careful or detailed formulation takes more time. Forcing a rapid response tends to cut short the time needed to produce an error-free action. Kupin (1982) also finds that the segments often ignored in fast speech are usually the unstressed syllables in that any saved time is invested in the normally information-rich syllables. In Chinese, the omitted elements are often the prevocalic glides (e.g., /i/ in (30) and /u/ in (31)), which are between the onset consonant and the nuclear vowel which carries the stress. Also, there has been debate on whether the prevocalic glide occupies a phonemic slot in the Chinese syllable structure or is just a phonetic feature associated with the onset (see Daunmu 1990). A

feature in a syllable is more easily omitted than a fully stressed syllable. The position of glides and the Chinese syllable structure are discussed in Chapter 4.

Example (36) illustrates the fact that the omitted segment /de/ is a non-stressed neutral tone syllable and hence easily omitted. But it also shows the speech phenomenon which some call ‘haplology’ (e.g., Chao 1968) or ‘cannibalism’ (e.g., Moser 1991), whereby two successive instances of a word or syllable appear, and one is ‘eaten’ by the other. An English example would be “*MIT shirt*” for “*MIT T-shirt*”, in which the two successive /ti:/ syllables were melded in one, or one was simply absorbed or ‘cannibalized’. Such an error seems to suggest that the speaker has already organized a complete sentence structure to convey the speech intention before individual slots are phonologically filled in. In the above case, the speaker plans to utter the word *T-shirt* with the modifier *MIT* before it. But the state of readiness for the utterance of *T-shirt* is so high that the identical syllable /ti:/ in the modifier *MIT-* is readily taken as the initial syllable of the next word *T-shirt*. Chao (1968) notes that two successive instances of the particle *de* (similar to the English apostrophe -’s, indicating the possessive case) are often reduced to one, such as *maicai de kuangzi* for *maicaide de kuangzi* ‘vegetable seller’s basket’.⁹ In my data, there is an example that involves the dropping of one of the two successive *de* particles (*shi ni qinai de de lai xin ba?* ‘Is it a letter from your darling?’ → *shi ni qinai de lai xin ba?*). But whether such a sentence should be considered an error is questionable in that the possessive particle *de* is often found dropped in other cases.

⁹ In Chinese, the particle *de* is often suffixed to a verb to change it to a noun (which stands for the performer of the action represented by the verb). For example, *changge* ‘to sing’, but *changge-de* ‘singer’: *kaiche* ‘to drive’, but *kaiche-de* ‘driver’. When the possessive particle *de* is added to this changed noun, there should logically be two *de*’s in a succession (e.g., *changge-de de maozi* ‘the singer’s hat’). However, native speakers usually omit one of the two particles in normal speech, and hence such omission should not generally be considered erroneous. Cannibalism is considered to cause an error only in cases when both *de* particles are necessary in an utterance.

which is considered quite normal (e.g., *wo de mama* 'my mother' → *wo mama*; *daxue de xiaozhang* 'university's president' → *daxue xiaozhang*). However, (36) does not contain two successive instances of the same word, but similar syllables. Note that the Chinese particle *de* is often pronounced as /di/. When it is followed by another /di/ syllable, such as in the case of (36), it is likely that cannibalism will occur. Since the first /di/ is the variation of the unstressed particle /de/ while the second /di/ is a fully-stressed syllable in the disyllabic word *difang* 'place', the former is more likely to be "eaten up". Example (37) involves the deletion of several syllables. Such omission of segments can be considered to be the result of a blending of two similar phrases. The difference between omission and blending is that omission involves one planned sentence (or utterance) part of which is missing in the production, while blending involves two competing sentences or words whose certain features or segments are blended into one.

Phonological errors in Chinese (as well as in other languages) show not only the independent or semi-independent phonological or phonetic features described by linguists which account for such errors, but also the processing stage where the phonological units are positioned in an utterance during speech production. The phonological rules in a language system order the categorical linguistic units at the level of word, syllable, phoneme, and phonetic feature, which explains our observation that even erroneous utterances do not randomly occur in unnamable shapes, but are constrained by the linguistic system. While one can find a misordered speech segment to result in the production of another unintended but actual word, one can not find such misordered segments which are not found in regular utterances. As described in Wells' (1951) early "First Law" of tongue slips, a slip of the tongue is practically always "a phonetically possible noise" in a given language, a linguistic constraint observed in the later literature (e.g., Fromkin 1971, 1980).

The classification of phonological errors is subject to different interpretations in different cases. A misordered segment in an error can be the result of anticipation, perseveration, substitution, or a combination of two or more of these processing activities which take place in the production of a single sentence. A phonological feature of a segment can be spread forward or backward, replaced or omitted depending on how it is processed. Phonologically similar segments tend to substitute for each other, indicating that segments with similar features are closer related to each other in the lexicon as well as in linguistic performance, as manifested by speech errors. The mismatch between one phonological segment and the target in an utterance can also be determined by non-phonological factors, since syntax and semantics are also important linguistic areas where speech errors occur. Given the reality that the similarity of phonological features plays a role in accounting for phonological errors, it will not be surprising if the words with similar syntactic features (e.g., same part of speech or grammatical category) or semantic features (e.g., words of the same semantic class) interchange in sentences.

3.3 Syntactic aspects of speech errors

Unlike speech errors of the phonological type that show deviation from the target utterance in terms of speech segments, syntactic errors in speech involve grammatical ill-formedness of the uttered sentences. Fromkin (1988), among other researchers on English speech errors, observes that the most commonly occurring speech errors are those which produce grammatically ill-formed sentences. These include misuse of lexical items, the wrong word class, the wrong application of transformational rules (see Fay 1980), the interaction between two competing plans (see Baars 1992) that involve different syntactic structures. These erroneous speech

units are usually phonologically well-structured and semantically comprehensible, but, in one way or another, they are grammatically ill-formed. This suggests that these errors occur at a higher speech production level where grammatical encoding takes place (see Levelt 1992). Chinese speech errors in syntax are not much discussed. Chinese grammarians (e.g., Chao 1968, Li & Thompson 1981) have described only the grammatically well-formed sentences among Chinese users, but not erroneous sentences that occur in actual speech. Chinese speech errors that have been discussed (e.g., Zhang 1990, Shen 1992) are largely accounted for phonologically, but not syntactically. But syntactic errors in Chinese do commonly occur. The errors from my collection involve larger speech units (words or phrases) than individual phonemes or syllables that are anticipated, perseverated, exchanged, or blended (as with phonological errors). These segments are morphologically complete lexical items that have different grammatical characteristics. Chinese and English may differ in many ways in terms of word structure and sentence structure, but speech errors in these languages seem to show much similarity in terms of the general patterns in which speech errors occur.

3.3.1 Lexical errors

Lexical errors involve the wrong selection or wrong use of lexical items in a planned utterance. Different lexical words possess different grammatical properties and perform different grammatical functions. When a lexical word is wrongly selected, or used at the wrong position in a sentence due to various factors, the result can be an ill-formed sentence, or a well-formed sentence that is far from the target in meaning. Speech errors in Chinese reflect the special characteristics of the Chinese grammatical structures. The underlined parts of the following sentences are the items

involved in the error, and the star indicates that the sentence is syntactically unacceptable.

- | | |
|--|--|
| <p>(38) huā le hěn <u>duō</u> shíjiān
 花了很多时间
 'spend very much time'</p> | <p>→ *huā le hěn <u>dà</u> shíjiān
 花了很大时间
 'spend very big time'</p> |
| <p>(39) fāyánrén
 外交部发言人
 'foreign ministry spokesperson'</p> | <p>→ wàijiāobù fāmíng rén
 外交部发明人
 foreign ministry inventor</p> |
| <p>(40) bǎ jiǎo fàng zài zhuōzi shàng
 把脚放在桌子上
 'put the foot on the table'</p> | <p>→ bǎ zhuōzi fàng zài jiǎo shàng
 把桌子放在脚上
 'put the table on the foot'</p> |
| <p>(41) qì de liǎn hóng bózi cū
 气得脸红脖子粗
 'turn red-face and thick-neck
 with anger'</p> | <p>→ qì de liǎn cū bózi hóng
 气得脸粗脖子红
 '... thick-face and red-neck...'</p> |

In example (38), the target word *duo* 'many/much' and the error *da* 'big' are both quantifiers of an object or an event. They are semantically similar in some cases (e.g., "big money" could also mean "much money" in English), which makes them possible competitors in the course of word selection during speech. However, the word *shijian* 'time' in sentence (38) subcategorizes for a quantifier of amount, not size. Although the speech intention is conceptualized into a pre-verbal message structure with the right syntactic specification, a wrong lexical item has been selected to substitute for the target one. Although *duo* and *da* share many features (hence are stored close together in the lexicon) and can be interchangeably used in many cases, the subcategorization of the word *shijian* makes the use of *da* in this sentence unacceptable.

In example (39), the target word *fayan ren* 'spokesperson' is replaced by *faming ren* 'inventor' for no particular semantic reason, since there is little in common between "a spokesperson" and "an inventor". Lexicographically, however, these two words might be listed very close to each other, due to similarities in morphological structure and phonological structure. In a Chinese dictionary, there could be a long list of words beginning with the morpheme *fa-*, such as *fabiao* 'to publish', *facai* 'to get rich', *faming* 'to invent', *fasheng* 'to happen', *fayan* 'to make speech', *fazhan* 'to develop'. However, only a few of these *fa-* words can be followed by another word or morpheme *ren* 'person' to form a compound word indicating the doer of the action described by the word, such as *fayan ren* 'spokesperson' and *faming ren* 'inventor'. These special lexical characteristics converge to group *fayan-ren* and *faming-ren* close together, enough to be activated simultaneously in the course of speech production.

Note that the substituted parts in lexical errors like (38) and (39) are themselves morphologically and semantically complete, forming independent lexical units. The replacement of these lexical units suggest that there is a processing stage that orders lexical items according to their semantic properties and grammatical functions. Unlike phonological errors that involve the interchange between phonological units (phonemes, features, syllables), exchanged lexical items tend to be words of the same grammatical class. Errors like (40) and (41) involve an exchange between lexical items of the same grammatical class (*jiao* 'foot' vs. *zhuo-zi* 'table', *hong* 'red' vs. *cu* 'thick'). This is because the grammatical structure of the phrase under active construction imposes restrictions on the selection of words in the course of grammatical encoding (see Levelt 1989). The grammatical structure of an intended sentence requires that a certain class of word (e.g., a noun, a verb, or a preposition) must be in a certain position in the phrase, and the speaker must select a word of that

class for that position accordingly. In these sentences, the well-formedness of the structure is maintained even after the slip has occurred. When individual words are exchanged, they tend to keep the completeness of the morphological and semantic structure of the words, regardless of the number of syllables they have (e.g., *jiao* ‘foot’ vs. *zhuo-zi* ‘table’). In contrast, when individual sounds are exchanged, the number of syllables of the exchanged sounds are usually the same even though it means separating a complete lexical word into two phonological parts (e.g., *yue shi guxiang ming* ‘the moon is brighter in hometown’ → *gu shi yue-xiang ming*, in examples (18) in section 3.2.3 above).

Lexical items of the same grammatical class can not only be exchanged with each other in a sentence, but can also replace each other in erroneous sentences of the omission type, as shown in (42).

- (42) *yǒu shì qǐng dǎ diàn huà zhǎo wǒ* → **yǒu shì qǐng dǎ wǒ*
 有事请打电话找我 有事请打我
 ‘please call me if you need me’ ‘please beat me if you need me’

The error in (42) involves omission of some lexical items in the sentence. The main clause of the target sentence consists of two verb phrases (*da dianhua* ‘make a phone call’ and *zhao wo* ‘to find me’) each containing two lexical items. It seems that the speaker was anticipating the final verb phrase *zhao wo* ‘find me’ while speaking the phrase *da dianhua* ‘make a phone call’, and such anticipation was strong enough to bring the lexical item *wo* ‘me’ to the position of the item *dianhua* ‘phone, phone call’, and the remaining part of the sentence was just omitted. Note that *wo* ‘me’ replaced *dianhua* ‘phone call’ in the sentence but not *da* ‘to send’ (in this case)¹⁰

¹⁰ The verb *da* in Chinese has a number of different meanings if used differently, such as ‘to beat/strike’ (e.g., *da gou* ‘beat/hit a dog’, *da jidan* ‘beat an egg’), ‘to build/produce’ (e.g., *da qiang* ‘to build a wall’, *da jiaju* ‘to make furniture’), ‘to buy’ (e.g., *da jiu* ‘buy wine’), ‘to play’ (e.g., *da*

because both *wo* and *dianhua* belong to the noun/pronoun class with similar grammatical functions. The sentence of (42) therefore still remains grammatically well-formed even after the error has occurred, but only with an entirely different meaning.

There is a special type of lexical error that involves a particular group of phrases in Chinese — classifier phrases and measuring phrases — which are expressed differently in English. As illustrated in Li & Thompson (1981), a classifier (CL) is a word that must occur with a number (e.g., *yi* ‘one’, *wu* ‘five’), a demonstrative (e.g., *zhe* ‘this’, *nei* ‘that’), or certain quantifiers (e.g., *mei* ‘every’, *ji* ‘a few/how many’). For example, the underlined parts in the following are all classifiers, for which English counterparts do not exist.

- (43) a. sān gè rén 三个人
 three CL person
 ‘three people’
- b. wǔ jiā fàndiàn 五家饭店
 five CL restaurant
 ‘five restaurants’
- c. zhè bēn shū 这本书
 this CL book
 ‘this book’

Note that *ge*, *jia*, and *ben* are among the several dozen different classifiers in Mandarin (see Chao 1968) and the choice is determined by the noun. In English, such a notion is simply expressed by a number, plus the single/plural form of the noun. If a Chinese noun modified by a number denotes an amount (such as *tian*

pai ‘to play cards’), and ‘to send’ (e.g., *da xinhao* ‘to send a signal’, *da dianhua* ‘to make/send a phone call’). Therefore, the error in (42) can be well understood as ‘Please beat me if you need me’,

(50) yǒu yì tiān
 有一天
 'one day' → *yǒu yí gè tiān
 有一个天
 'there is a day'

The underlined parts of the above examples are all classifiers/measure words that have been wrongly used in speech. In (45) the classifier *ge* is replaced by another classifier *tou* which is usually used to modify an animal (e.g., *yi tou niu* 'a cow', *yi tou zhu* 'a pig'), but not a person. The speaker is following the grammatical rule of using a classifier before the noun, but made a mistake in the lexical selection of the right item. The noun *qiang* 'gun' in (46) (the classifier for which is usually *ba*) can have a modifier to show its features, such as size, color, model (e.g., *da qiang* 'big gun', *wanju qiang* 'toy gun'). When the noun has both a classifier and a modifier, the classifier usually goes before the modifier (e.g., *liang ba da qiang* 'two big guns'). However, the modifier *da* 'big' in sentence (46) has switched position with the classifier *ba*, which is also a measure word meaning 'a handful of' (e.g., *yi ba tang* 'a handful of candies'). As a result, *da* is interpreted as the modifier of *ba*, and they together modify the noun *qiang* 'gun', resulting in the sentence *na yi da ba qiang* 'hold a big handful of guns', which is entirely different in meaning from the target sentence.¹¹

The intended sentence of (47) involves two classifiers, *tiao* required by *chuan* 'ship' and *zhang* required by the countable noun *xiang* 'picture'. Chinese grammar allows for the deletion of a classifier after a demonstrative (e.g., *zhe ge ren* = *zhe ren* 'this person'). Therefore, it is acceptable for the classifier *tiao* to be deleted before *chuan* 'ship', leaving the noun to be modified directly by the demonstrative *zhe*

¹¹ Since Chinese does not have special morphemes to mark plurality (except for *-men* suffixed to animate nouns or pronouns, as in *tamen* 'they/them', *xueshengmen* 'students'), 'a handful of something countable' is understood as plural.

‘this’. But what is interesting is that the classifier *tiao* is not deleted, but moved to the position of the other classifier *zhang*, resulting in an unacceptable sentence.

Examples (48) and (49) both involve measure words, *pen* ‘basin’ and *ping* ‘bottle’, which take the modifiers of size *da* ‘big’ and *xiao* ‘small’, respectively. The switch between the measure word and its modifier causes the ungrammaticality of the two sentences, similar to the case found in (46). As mentioned earlier, a measure word in Chinese does not take a classifier; therefore, (50) is ungrammatical because the classifier *ge* is added to modify the measure word of time *tian* ‘day’.

The above errors show that lexical selection is not randomly conducted, but has to strictly follow the grammatical rules of a given language. When these rules are not applied, or applied improperly, such as in switching a classifier and a modifier, or choosing a lexical item with different subcategorizational requirements, an error is likely to occur. Lexical errors are different from purely phonological errors in many ways. They involve ‘misordered’ speech segments much larger than a phoneme, a phonetic feature or a syllable, and they are closely related to relations between lexical items and the syntactic structure of a sentence rather than a syllable structure. For example, a measure word in an error is usually replaced by another measure word rather than by a sound phonologically related word of a different grammatical class, indicating that the sentence planner has decided on the sentence structure that requires a measure word, and the problem lies in the retrieval of the right one. Again it shows that phonological processing and lexical selection are different processing stages in speech production.

3.3.2 Structural errors

Many traditional speech error analyses assume that speech production is strictly governed by primarily morphophonemic or phonological rules (e.g., Fromkin 1973). Later scholars (e.g., Fay 1980, Garrett 1980, 1988, Stemberger 1985, 1992, Baars 1992d) have directed their attention to the role that syntactic rules play in the occurrence of speech errors. Speech errors in Chinese also show a speaker's deviation from the target sentence structure in the course of speech production. Given that a speech intention can be realized in many structural forms in a language system, these structural forms, if improperly processed while planning the speech, can cause structural errors. The following examples from my data illustrate the point.

- | | |
|--|---|
| <p>(51) wǒ kàn tā <u>méi</u> sǐ 我看它没死
‘I saw that it did not die’</p> | <p>→ wǒ <u>méi</u> kàn tā sǐ 我没看它死
‘I did not see it die’</p> |
| <p>(52) wǒ sūnzi zhèngshì shàngxué
我孙子正式上学
‘my grandson has formally started</p> | <p>→ wǒ sūnzi shàng zhèngshì xué
我孙子上正式学
?’... goes to a formal school’</p> |

Example (51) involves the shift of the negative *mei* 没 from the position before the verb *si* ‘die’ to the position before the verb *kan* ‘see’. According to Chao (1968), *mei* is the auxiliary verb for ‘have not ... -ed, did not ...’ (666), and it negates the main verb that follows it (e.g., *ta mei zou* ‘He has not left’, *Zhangsan mei dasuan lai* ‘Zhangsan did not plan to come’). The shift of *mei* in (51) causes the change of the sentence structure, that is, from the target structure that negates the verb *si* ‘die’ (whose subject is *ta* ‘it’) in the subordinate clause to the unintended structure that negates the verb *kan* ‘see’ (whose subject is *wo* ‘I’) in the main clause. Such a

structural change, in turn, causes the semantic change of the sentence as indicated in the gloss of (51).

Similarly, example (52) involves the position change of the word *zhengshi* 正式 'formal/formally'. There are many cases of overlapping of adjectives with adverbs in Chinese (and in English, for that matter). That is, a word can be used as an adjective (e.g., when modifying a noun) or as an adverb (e.g., when modifying a verb). The word *zhengshi* is one of this kind (e.g., *Lisi shoudao le Zhangsan de zhengshi yaoqing* 'Lisi got a formal invitation from Zhangsan' vs. *Zhangsan zhengshi yaoqing le Lisi* 'Zhangsan formally invited Lisi').¹² The word *zhengshi* in (52) is shifted from its target position before the verb *shangxue* 'go to school' (which is modified by *zhengshi* as an adverb) to the position after *shang* 'go to' and before *xue* 'school', hence switching its grammatical function as an adverb to an adjective. Note that if *zhengshi* (which separates *shang* and *xue*) functions as an adjective to modify the noun following it, the sentence becomes not only semantically different, but also pragmatically questionable. The morpheme *xue* has the meaning of 'school' only when combined with other morphemes to form complete words such as *xue-xiao* 'school', *da-xue* 'university', *zhong-xue* 'high school', or *shang-xue* 'go to school'. Therefore, the phrase *shang zhengshi xue* in (52) is structurally ill-formed.

In the discussion of phonological errors, we find that phonological features from two competing items can be blended in speech production, different sentence structures can also be blended in the production of one single sentence. Stemberger (1982, 1985) argues for an interactive activation theory which asserts that two simultaneously activated sentence structures can interfere with each other. Baars

¹² Just as some adjectives overlap with adverbs, some nouns also overlap with verbs. The word *yaoqing* 'invite/invitation' can be used both as a noun and a verb.

(1992d) suggests that two competing speech plans can blend segments from two planned utterance into one output, as evidenced by speech errors. From a syntactic point of view, some errors in my Chinese data can indeed be accounted for this way. Example (53) illustrates the point.

- (53) *nǐ chī fàn le ma?* → **fàn chī fàn le ma?*
 你吃饭了吗? 饭吃饭了吗?
 'did you eat your meal?' 'did meal eat meal?'

Note that Chinese is a 'pro-drop' language in which, in a certain speech context, a pronoun can be dropped from either a subject position or an object position, while English requires all pronouns to be fully specified (see Huang 1984, 1989). The target sentence in (53) (hereafter numbered (53')) can be structured in the form of either (53a) or (53b), both of which are well-formed with the meaning unchanged. In the following illustrations, **perf.** stands for "perfect tense marker", **Q** stands for "question marker", and **EC** stands for "empty category".

- (53') *ni chī fàn le ma?*
 you eat meal perf. Q
 'Did you eat your meal?'
- (53a) *EC chī fàn le ma?*
 EC eat meal perf. Q
 'Did you eat your meal?'
- (53b) *fàn, EC chī le ma?*
 meal EC eat perf. Q
 'Did you eat your meal?'

From the above examples, we see that the subject pronoun *ni* 'you' is dropped in (53a), leaving an empty category (EC) in the gap, resulting in a

“subjectless” sentence.¹³ Example (53b) is a topic-comment structure, with *fan* ‘meal’ as the topic and the rest of the sentence as the comment. Both sentences are well-formed and they represent different syntactic structures in Chinese grammar. However, this structural variation may cause speech errors of the syntactic type. The error in example (53) seems to indicate that the speaker had two simultaneously activated syntactic structures ((53a) and (53b), or experienced a conflict between two competing sentences: *fan chi le ma* (Target 1) / *chi fan le ma* (Target 2) → *fan chi fan le ma* (mixture). Just as the blending of different words can result in a nonsense word, the blending of two sentences can result in a non-grammatical sentence. This approach explains a number of syntactic errors in my data (e.g., *weishenme yao zheme duo* 为什么要这么多 ‘Why do you want this much?’ (Target 1), *yao zheme duo ganshenme* 要这么多干什么 ‘You want this much to do what?’ (Target 2), → **weishenme yao zheme duo ganshenme* 为什么要这么多干什么 ⚠ ‘Why do you want this much to do what?’ (blended result)).

There are other syntactic errors that involve the wrong application of grammatical rules in Chinese. Example (54) shows the wrong application of the Chinese *ba*-construction.

(54) wǒ dēngjì le 我登记了 ‘I have registered’	→	*wǒ bǎ jì dēng le 我把记登了
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¹³ Syntactically, all the fragments of a well-formed sentence should be complete constituents, and these constituents should be fully specified. In real speech, some constituents can be omitted, but their positions in the sentence cannot be replaced by other constituents. These positions, though empty, still function syntactically as though the omitted constituents are still there. An English example would be: **Speaker A:** *Who will clear up the mess?* **Speaker B:** *The caretaker will.* We know that in sentence B there is an incomplete constituent (i.e., *will*), but the sentence still remains well-formed because of the function of the empty category (i. e., *clear up the mess*) (see Radford 1988). This linguistic feature also exists in Chinese, and the frequently omitted constituents are often pronouns in the subject position, hence the term *pro-drop*.

The *ba*-construction (e.g., *wo ba ta da le* = *wo da le ta* ‘I hit him’) is regarded by Chao (1968) as a pre-transitive construction, a special sentence structure that requires a subject (e.g., *wo* ‘I’), a main verb in the sentence (e.g., *da* ‘hit’), a pre-transitive verb *ba*, and an object (e.g., *ta* ‘him’). Although this explanation of “pre-transitive *ba*-construction” is agreed on by other traditional Chinese grammarians (e.g., Li & Thompson 1981), it neglects the “intransitive” nature of the verbs used in *ba* construction. That is, there are uses of the *ba*-construction that involve no transitive verbs. For example, in a *ba*- sentence like *ta ba yanjing ku hong le* ‘she cried her eyes red’, the main verb *ku* ‘cry’ is not transitive. Yang (1995) has recently provided a new analysis of the *ba* construction which brings out the aspectual limitations on the construction. Whether Chao’s (1968) or Yang’s (1995) analysis is followed, it is clear that in the simplest *ba*-construction the verb which occurs with *ba* must be transitive and its object must appear structurally between *ba* and the transitive verb. For example, Yang (1995) observes that “only transitive verbs [though not all of them] appear in [the] type of simplex verb *ba* or *bei* sentence[s]” (145).

In (54), *dengji* ‘to register’ is an intransitive verb (the speaker meant to say that he and his fiancée had registered for their marriage license) and does not take an object. The use of *ba*-construction in a sentence that has only subject plus an intransitive verb without any object is not acceptable, even in the types of *ba*-sentences that lack transitive verbs (see Yang 1995). The speaker must have mistaken the disyllabic verb *deng-ji* ‘to register’ for a two-word phrase (VP + NP), with *deng* as the verb taking the object *ji*, hence the wrong application of the *ba*-construction.

Syntactic errors sometimes involve the addition or omission of a certain part of a sentence. Although such addition/omission phenomena can be analyzed from a

If the verb is disyllabic, a still shorter form of the question repeats just the first syllable of the verb, as in (55c).

(55c) nǐ zhī bù zhīdào
 'Do you know or not?'

The error in (55) suggests that the speaker has attempted to choose between competing (55b) and (55c). As a result, the speaker was using the syllable structure of (55b) while using the form of (55c), taking /bu/ as the syllable slot filler. Since both (55b) and (55c) are the correct forms for the question, they are likely competing for the final articulation, hence the error.

Also, when rules of morphological reduplication are wrongly applied, errors like (56) may be the result.

<p>(56) wǒ qù kànkān 我去看看 'I go and have a look'</p>	<p>→ wǒ qù kànkān kànkān (29) 我去看看看看</p>
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Example (56) involves the duplication of the verb *kan* 'to see'. In Chinese, words of different classes can be reduplicated for different grammatical functions (see Chao 1968). One of the functions that a reduplicated action verb shows is the "tentative aspect" (Chao 1968: 204). Therefore, *xiang* 'to think', *xiang-xiang* 'just think'; *zou* 'to walk', *zou-zou* 'walk a little'; *kan* 'to look', *kan-kan* 'just look'. Such reduplication is also applicable to two-syllable action verbs such as *kaolü-kaolü* 'to think it over', and *duanlian-duanlian* 'to have a little exercise'. But in (56), the speaker might have mistaken the reduplicated verb *kan-kan* for an unreduplicated disyllabic verb. As a result, the reduplication process in the sentence is conducted twice, reduplicating the already reduplicated verb. Although such errors are rare, they

suggest that the Chinese morpho-syntactic reduplication rules are sometimes wrongly applied in the course of speech production, resulting in ill-formed utterances.

Speech errors of the syntactic type show that speech not only employs the sound units described in linguistic theories, but suggests that this process is governed by grammatical rules as well. Although different researchers account for speech errors following different models, the mechanisms for speech production in general remain the same across languages. At this point, it is necessary to make clear that speech production is rule-governed and such rule-government occurs at different stages of the production process. Any wrong application of these rules, either phonological or syntactic, can lead to structural changes of the target sentences resulting in speech errors that cannot convey the intended meaning. Speech errors can be used as evidence to show the internal structure of language in general, and they show that the meaning of the speech units involved in an error, as well as the speech context, can also affect the production of normal speech.

3.4 Semantic errors

Speech errors of the semantic type refer to those utterances where the syntactic structure is well-formed and the lexical items in the sentence are phonologically legitimate, but they are not the intended utterances and are different from the targets only in meaning. There are semantic similarities or relatedness between the error and the target. That is, the target in whole-word slips is substituted for by another word which has similar semantic features. In discussing speech errors in English, Fromkin (1971), Nootboom (1969), Hotopf (1980), and others find that

slips of the semantic type fall into three types. One type has error and target words standing in antonymous relationships to one another (such as *like* for *hate*, *hot* for *cold*). Another type has semantic slips that fall into the same semantic class (such as *night* for *dark*, *spoon* for *fork*). And yet another type of semantic error involves hyponymous relations between the error and the target word, so that error and target words are “semantic cousins... rather than siblings” (such as *Europe* for *Britain*) (Hotopf 1980: 98). Similar errors of these types are also found in Chinese, as the examples below from my data demonstrate.

- | | | | |
|------|---|---|--|
| (57) | bú gòu cháng 不够长
‘not long enough’ | → | bú gòu duǎn 不够短
‘not short enough’ |
| (58) | xià bān zhème wǎn 下班这么晚
‘off work so late’ | → | xià bān zhème zǎo 下班这么早
‘off work so early’ |
| (59) | lè de zuǐ dōu bì bú shàng le
乐得嘴都闭不上了
‘(He) laughed so much that
he can’t close his mouth’ | → | lè de yá dōu bì bú shàng le
乐得牙都闭不上了
‘(He) laughed so much that
he can’t close his teeth’ |
| (60) | bǎ niú nǎi fàng jìn bīngxiāng lǐ
把牛奶放进冰箱里
‘put the milk into the fridge’ | → | bǎ niú nǎi fàng jìn kǎoxiāng lǐ
把牛奶放进烤箱里
‘put the milk into the oven’ |

The above examples show that the error and the target share semantic features, rather than phonological and syntactic ones. Errors and their targets can be antonymous (such as *duan* ‘short’ for *chang* ‘long’ in (57), *zao* ‘early’ for *wan* ‘late’ in (58)), or of the same semantic class (such as *ya* ‘teeth’ for *zui* ‘mouth’ in (59), *kaoxiang* ‘oven’ for *bingxiang* ‘refrigerator’ in (60)). They can be in other relations that are difficult to categorize (e.g., *pianyi* ‘cheap’ for *nianqing* ‘young’ as in *zhaopian bi ta benren nianqing* ‘she looks younger (than herself) in the picture’ → *zhaopian bi ta benren pianyi* ‘she looks cheaper (than herself) in the picture’).

Semantic errors like these errors suggest that lexical items are stored in the lexicon in such a way that items with related semantic features are grouped together. As the activation theory (Stemberger 1985) describes, as a given unit/word becomes activated, it begins to pass activation to all the units/words that are associated with it. Such association spreads at the phonological, syntactic, and semantic levels, leading to partial activation of non-target items. As analyses of my data suggest, most semantic errors (see **Appendix: Semantic errors**) do not show much phonological relatedness between an error and its target as do the phonological errors of the anticipation, perseveration, or metathesis types (see **Appendix: Phonological errors**), supporting the idea that speech is processed at different levels.

How does a speaker choose the target word from an array of semantically related choices? Generally, a more frequent word is more likely to be produced than a less frequent one. As described in Hotopf (1980), there are many slips where a person, a place, or an object having a particular role in a relationship with the speaker, is called by the name of the previous occupant of that role. For instance, one may call a new friend by the name of an old friend, call a less familiar place by the name of a more familiar one. There are also cases where certain members of a semantic group are of equal frequency, and the speaker has to run through the entire set of items until the right choice comes along. Sometimes this process of word skimming is reflected verbally in normal speech. The following examples are from my own data.

- (61) wǒ xiǎng mǎi jiāojiǎn...lùxiàngjī...lùyīnjī...lùyīndài
我想买胶卷 — 录相机 — 录音机 — 录音带
'I want to buy a film — a video camera — a tape recorder — a cassette
tape.'

- (62) nǐ qíchē — zuòchē — kāichē qù ma?
你骑车 — 坐车 — 开车去吗?
'Do you go there by bike — by bus — by car?'

The speaker in (61) was searching for the right place to buy some cassette tapes in a shopping mall when asked what she wanted. Apparently, all the related lexical items were checked in her mind (e.g., *jiaojuan* 'a film', *luxiangji* 'a video camera', *luyinji* 'a tape recorder') before the right choice *luyindai* 'a cassette tape' came along. If we assume that the lexical items are activated in the same order as they were uttered, we can see how lexical items are semantically linked together as a group in the speaker's lexicon, or how activation spreads to activate non-target items along with the target: *a camera film* → *a video camera* → *a tape recorder* → *a cassette tape* (the target).

Similarly, the speaker in (62) was asking a friend if he was driving downtown, but slipped into several other means of transportation before the right choice was selected, which shows the semantic link between the phrases that are grouped together: *qiche* 'ride a bike' → *zuoche* 'take a bus' → *kaiche* 'drive a car'. These errors seem to suggest that when names in these groups are of high and approximately equal frequency, they are more likely to be confused with one another in the course of speech production.

The error and target words in semantic slips can be related to each other through other links. The anticipation or perseveration of a lexical item in the sentence may change the target word to some other word that is semantically related to the word that is anticipated or perseverated, as shown below.

- (63) hē bēi chá, chī liǎng kuài bǐnggān → hē bēi chá, chī liǎng kuài kāfēi
 喝杯茶, 吃两块饼干。 喝杯茶, 吃两块咖啡
 'have a cup of tea and two pieces of cookies' 'have a cup of tea and two pieces of coffee'
- (64) běijīng rén zài nǚyuē → měiguó rén zài nǚyuē
 北京人在纽约 美国人在纽约
 'a Beijing native in New York' 'an American in New York'

In example (63), the error word *kāfēi* 'coffee' may not share many semantic features with the target word *bǐnggān* 'cookies' which has a quantifier *liǎng kuài* 'two pieces of'. But it is more closely related to the lexical item in the previous phrase — *chá* 'tea'. It seems that when the speaker is retrieving the word *chá* 'tea' in the plan, the "neighboring word" *kāfēi* 'coffee' is also activated. Since the ordering of the retrieved items is in a linear process, the first choice *chá* goes into the right word slot in the sentence structure, while the other choice *kāfēi* gets into the next suitable slot, the one for the target word *bǐnggān* 'cookies', hence the error. Similarly, the target word *běijīng rén* 'a native of Beijing' in (64) is replaced by the error word *měiguó rén* 'an American', or rather (disregarding the identical syllable *rén* 'person' in the two compound words), *běijīng* 'Beijing' is replaced by *měiguó* 'America', which is semantically closer to the following noun phrase *nǚyuē* 'New York' in a geographic sense. Therefore, *běijīng* is replaced by *měiguó* not simply because they are within the same semantic subcategory, but rather because many of the semantic features of the word *nǚyuē* 'New York' are anticipated. This triggers the activation of the semantically related word *měiguó rén*. In other words, errors of the semantic type do not simply involve a mismatch between the error and the target words in terms of phonological features and grammatical categories, but they also indicate that the semantic features of certain other items in a planned sentence can also be anticipated and perseverated.

The classification of semantic errors is not easy since the relations between an error and the target can be very different. It is arbitrary to classify the event of *opening a shop* and that of *a flower blossoming* as being in the same semantic category. Similarly, *bicycle* and *wind* do not share any semantic features. Nevertheless, unrelated lexical items do sometimes substitute for one another in real speech. This is because the speech context, or environment, can link these items into a single event. This type of error is what Garrett (1980) terms “environmental contamination”. The following Chinese errors can serve as examples.

- | | |
|--|--|
| (65) kāi diàn le ma? 开店了吗
‘is the (flower) shop open?’ | → kāi huā le ma? 开花了吗
‘is the flower blossoming?’
(at a flower shop) |
| (66) fēng hǎo dà 风好大
‘it’s too windy’ | → chē hǎo dà 车好大
‘such a big bicycle’
(on hearing a bike falling in the wind’) |
| (67) qiē niú ròu 切牛肉
‘cut beef’ | → qiē zhī má 切芝麻
‘cut sesame’
(spreading sesame on the beef) |
| (68) chē kuāng zhēn dà 车筐真大
‘what a big bicycle basket’ | → shū bāo zhēn dà 书包真大
‘what a big schoolbag’
(putting a schoolbag into a bike basket) |

The environmental contamination errors above may appear a mixed group, but they suggest an interaction between the processing store used in speech production and the storage system we use to monitor the passing products of the roving attention (Garrett 1980). They also suggest that speech production processes monitored by the speaker can be influenced by the speech environment at an early speech planning stage. The general finding of semantic errors shows that the target lexical items are replaced with other items that are of the same grammatical class

(see **Appendix: Semantic Errors**), which indicates that the lexical storage is categorically arranged, and that the processing of these items are at a higher level in speech production.

3.5 Summary

Speech errors in Chinese, when compared to speech errors in English, support the argument that speech errors occur universally, and that they occur in similar patterns across languages. We see that speech errors in Chinese, much like those discussed in English, can be generally classified into categories such as anticipation, perseveration, exchange, substitution, blends, addition and omission. The error and the target usually show relations at different levels of language structure: phonology, morphology, syntax, and semantics. Phonological errors tend to show movement, exchange, blending, or substitution of a certain phonological segment, which could be a syllable, a phoneme, or a phonetic feature. Errors of this kind provide evidence that speech is processed in terms of the linguistic units described in linguistic theories. These units seem to be organized in our speech production system in such a way that speech segments at the same level interact with each other (e.g., phonemes with phonemes, syllables with syllables) rather than cross levels. Furthermore, segments that share more similar phonological features are more closely associated with each other, featuring the inter-relatedness between a phonological error and its target.

Syntactic errors involve the structure of the sentences that are spoken. They can show in different ways the grammatical encoding process in the course of speech production, such as selecting and retrieving lexical items, sorting out the

grammatical relations between these items and placing them in the sentence structure. Any mal-functioning of the processing mechanisms can result in the change of the planned structure (e.g., changing an adverb into an adjective, negating a wrong word, or double reduplicating a verb). Although speakers of different languages follow different syntactic rules, the mechanisms for the rules to be applied in speech are cross-linguistically similar. Language specifics may determine that a certain sentence in a language may be spoken in different structural forms, and different structures can be simultaneously activated, compete against each other in the course of a speaker's speech planning. When the speech planner fails to determine which structural form the final utterance should take, the result can be a speech error of the structural blending type. Once the speaker has decided to form speech according to one structure, different syntactic rules required by this structure have to be applied, and the retrieved lexical items will be positioned in the right order, resulting in a well-formed sentence that conveys the speaker's intention.

To convey a speech intention, a sentence has to be not only syntactically well-formed, but semantically appropriate in its structure. The process of lexical selection in the vast lexical storage is important for such semantic appropriateness. Semantic errors discussed in this chapter show that lexical items are grouped together for retrieval according to their semantic features. In the course of speech production, the activation of the target may trigger the activation of the items that are associated with it in terms of semantic features. This association can be either hyponymous or complementary, and word frequency also plays a role. In cases where word frequency is equal between competing items, the speaker tends to run through a list of the semantic group before eventually making the right choice. Of course, such semantic grouping has much to do with the speaker's social, cultural and linguistic background, which may determine the semantic relations between

items from individual to individual. Errors of the environmental contamination type frequently occur when speakers are deeply involved in the speech environment which produces a deviation between what is planned to say or what is being said and its target, showing that speech production is much influenced by the speech environment. They also suggest that during speech, the speaker is also processing and monitoring other lexical items that are contextually related.

Speech production is a multi-level cognitive activity. There have been many different theories to explain the different types of speech errors, which have led to different speech production models being proposed. Various speech production models and their implications will be discussed in relative details in Chapter 5. In general, speech errors are cross-linguistically similar in terms of their patterns. But language specifics may also have a bearing on which specific errors and their particular characteristics which are not shared by other languages will manifest themselves. The next chapter will discuss just such language specifics and their characteristics as demonstrated by the evidence from speech errors in Chinese.

Chapter 4

Speech Errors and Language Specifics

4.1 Introduction

The different types of Chinese speech errors discussed in the previous chapter occur in patterns very similar to those found in English. This supports the common assumption that languages share universal characteristics. However, languages also have specific characteristics that are not shared by other languages, and certain aspects of speech that are common in one language may not occur in another. For example, Chinese is a tone language in which tones play a vital role in determining the phonological and semantic identity of a word. Such tonal characteristics are not shared in non-tonal languages such as English.¹ The English word *yes*, for example, can be uttered in any tonal pattern (or intonation, for that matter, e.g., rising tone, falling tone, or high level tone) without altering the lexical content of the word. In Chinese, the phonological sequence /shi/ represents entirely different words when pronounced with different tones (e.g., *shi* (T1)² 诗 'poem', *shi* (T2) 石 'stone', *shi*

¹ For English, it is often observed that stress is associated with a higher tone and that it plays a similar role in determining the part of speech of English words (e.g., *export* vs. *export*). Chinese tones are phonemic in nature. They determine not where to put an emphasis in an utterance (since syllables with different tones can also carry a stress), but to determine the lexical properties of a word.

² The common practice for marking the tones in *pinyin*, the Romanized spelling system for Mandarin Chinese, is to put diacritics above the nucleus vowel in a syllable. For example, the four different tones for the syllable /ma/ are represented with *mā*, *má*, *mǎ*, *mà* respectively. For the sake of

(T3) 史 'history' and *shi* (T4) 是 'yes'). Tones in Chinese are an inseparable component of the syllable, but this component can sometimes move independently across syllables in the course of speech production. Just like other phonemic features (e.g., [±aspiration]) that can be shifted, tones can also be anticipated, perseverated, or exchanged during speech, suggesting that tones are features which are independent of the syllables they are associated with. Such tonal movement does not randomly occur. There are rules and regularities to tonal performance in speech, and studies of misordered tonal behavior in speech errors can provide information about how tones in speech are processed in the course of production.

In addition, Chinese has a *logographic* writing system in which a character is formed with different logographic configurations of components, radicals and strokes. These different parts are not simply drawings which are embodied in the seemingly pictographic Chinese character, but they are symbols which carry logophonographic features. These features can represent the sound or the meaning of the character, are processed through different routes (see Flores d'Arcais 1992), and in turn help a speaker to activate or retrieve a planned lexical item. When considering relationships between errors and their targets, traditional error analyses have tended to look at the grammatical and phonological relationship between the error and the target in spoken sentences, but recent psycholinguistic research (e.g., Fok & Bellugi 1986, Nihei 1986, 1988, Hoosain 1991, 1992, Flores d'Arcais 1992) also pays attention to the relation between the written structure of the language and the phonological features of spoken words in the course of speech production and perception. For many Chinese speakers, the written structure of a lexical form plays a very important role in triggering the articulation of that item, particularly if the item

emphasis, an alternative tone marking system (T1, T2, T3, and T4) is also used throughout this chapter. The neutral tone in this system is represented as T0.

is not frequently used, hence harder to retrieve. For example, the character 米 has a phonetic representation of /mi/, but this character also occurs as a phonetic radical in many other characters, some of which are not commonly used. In retrieving lexical items such as *mi* 糜 'elk' and *mi* 醚 'ether' (which are not commonly used in daily speech), the radical *mi* 米 may come to a speaker's mind (mentally visualized) before other parts of the character. This indicates that the articulation of a lexical item is closely related to the way the item is structured in its written form.

Furthermore, the production of speech in a bilingual's first language (L1) can be influenced by cross-language interference from a second language (L2). Such influence can involve phonological features, semantic relatedness, and syntactic structures of a second language that are similar to those of the speaker's first language. Unlike forms of speech behavior such as *code switching*, which are used mostly for socio-political and socio-psychological purposes, bilingual errors demonstrate a language processing system that operates between the parallel language structures in the course of speech production (see Sridhar & Sridhar 1980). When speech production is conducted in L1, the corresponding grammatical items in L2 may also be activated. The characteristics of L2 may interfere with the normal production of L1; it thus can cause a special type of speech error that has so far received little attention.

The speech errors to be discussed in this chapter are language-specific, in that they are common in Chinese but may not have counterparts in other languages such as English. These errors, like other kinds of speech errors, also provide insights into the language production process. One important role that speech errors play is that these errors may raise questions about some of the already established theories concerning the grammatical structure of the Chinese language. For example, the

Chinese errors that involve movements, addition or substitution of glides (/i/ and /u/) have led to the re-examination of the traditional analysis of Chinese syllable structure (e.g., Shen 1991, Duanmu 1990). Speech errors can also lend evidence to support new hypotheses. Although Chinese speech errors generally occur in patterns similar to those found in English, indicating a degree of linguistic universality, the language-specific errors discussed in this chapter illustrate that the special characteristics of individual languages should not be neglected by linguistic studies in their rush toward elucidating universals.

4.2 Speech errors in tones

Like other phonological features, tones play a distinctive phonological role in Chinese speech. Much work has been done on Chinese tonology in the past few decades (e.g., Wang 1967, Yip 1980, Bao 1990b), and one of the most important theoretical advances is its shift of focus from linear to non-linear analyses of the tonal features. Developed out of the standard generative phonology, autosegmental phonology (Goldsmith 1979) has presented the non-linear features of tone with support from tonal behaviors in African languages. It could have benefited Goldsmith (1979) and Yip (1980) much in explaining the autosegmental feature of Chinese tones if speech errors in Chinese that involve tones had also appeared in their discussion. These errors could have clearly demonstrated that tones in Chinese behave as if they a life of their own (see Lin 1992). There are four different tones in Mandarin Chinese, which are usually numbered as 1st, 2nd, 3rd, and 4th tones, and are represented by the different tone markers over the nucleus vowel in a syllable (e.g., mā (T1) 'mother', má (T2) 'hemp', mǎ (T3) 'horse', mà (T4) 'scold') in Chinese *pinyin* system. These tones have distinct pitch values and consist of tonemes in the

pattern of HHH, MMH, LLM and HML respectively (see Lin 1992). Studies on speech errors that involve tones have been little discussed in the literature, but such studies help understand the autosegmental features of the Chinese tones. Every stressed syllable carries a tone, but the tone of a syllable can sometimes be accommodated in another syllable to produce an erroneous utterance. These tonal errors may provide information about the way speech is planned and produced. Few previous speech error models have taken tonal behaviors into consideration, since most of the models are based on non-tonal European languages.

It has been suggested that tones are just like other phonetic features which can operate independently, following their own rules as they contribute to the course of speech production. Gandour (1977) showed that tones in Thai are anticipated, perseverated, and exchanged, just as segments are in English and other languages. Shen (1992) and Moser (1991, 1992) have also provided examples to show that tonal errors in Chinese can occur in different patterns. As Shen (1992) showed in his data, a tone can be anticipated. For example, *tícai(T2) shì(T4) gùdài(T4) yú(T4)yán* 题材是古代寓言 'the topic is that of a classic fable' → *tícai(T4) shì(T4) gùdài(T4) yú(T4)yán*, in which case the syllable /cai/ changes from T2 to T4 due to the tonal influence from the following T4 syllables. Another example shows that a tone can also be perseverated: *shuō tā bà(T4) kǒu(T1)* 说她爸抠 'her father is said to be stingy' → *shuō tā bà(T4) kǒu(T4)*, in which case the syllable /kou/ changed from T1 to T4 due to the perseveration of the previous T4 associated with the syllable /ba/.

Tones are a vital part of Chinese phonology, and assigning the wrong tone to a word may cause the loss of the semantic content of the word entirely. Chinese speakers are therefore sensitive about putting the right tone on the right syllable in an utterance. Also, since there are only four tones in Mandarin Chinese that can possibly

be applied to a stressed syllable, it is relatively easy to identify a tone error and trace the cause of the error once it occurs. An erroneous tone can be the result of the influence of the tone in a neighboring syllable, or of the tone of another semantically related item that is also activated along with the target item. In this case, the tonal error can be regarded as either an anticipation, a perseveration, or a switch. The following are a few such examples of speech errors from my data that involve Chinese tones.

- (1) shìchǎng jiàgē 市场价格
‘the market price’ → shìchǎng jiāgē
- (2) huǒchē fēijī 火车飞机
‘trains and planes’ → huǒchē fěijī
- (3) fěnhóng fèng huáng, hóngfěn fèng huáng → fēn hǒng fèng huáng
粉红凤凰, 红粉凤凰
‘pink-red phoenix, red-pink phoenix’

Example (1) involves a tonal change of the syllable /jia/ of the word *jiage* ‘price’ from the target T4 to the erroneous T2. This appears to be the result of anticipation of the following T2 syllable /ge/ during speech production. This anticipation moved the tone of the later syllable to an earlier syllable, hence the tonal error. By the same principle, example (2) shows tonal movement in the opposite direction. The first syllable /fei/ of the word *feiji* 飞机 ‘plane’ changed from T1 to T3, suggesting that the tone of the syllable /huo/ (T3) in the word *huoche* 火车 ‘train’ is perseverated, changing the syllable /fei/ to T3. Our discussion on the phonological errors in the previous chapter has shown that speakers tend to pattern the retrieved phonological segments and their features, the tonal change in (2) above is just

- (5) jìn xíng shāixuǎn → jìn xíng xuānshǎi
 进行筛选
 'to conduct selection'

The above two examples do not seem to involve any movement of the tones *per se*, but rather the movement of the syllables that are originally associated with them. In Example (4), *xiao* 小 'young, small' and *lao* 老 'old' both carry a T3, which normally changes to T2 when followed by another third-tone syllable through the tone sandhi rule. Therefore, the tone of the syllable /lao/ (T3) in *laoma* is changed to /lao/ (T2) before /ma/ (T3). When the two initial syllables (/xiao/ and /lao/) exchange their positions in the slip, the tones accommodate to the new environment, becoming *laozhang* (T3-T1) and *xiaoma* (T2-T3). This tonal behavior suggests that the slip has occurred earlier on in the planning stage, when the two lexical items were first retrieved: later, when the tonal and segmental information was assigned, the appropriate tone sandhi rule was invoked, resulting in the tonal sequence. Here we see that lexical access takes place before phonological encoding. What is first retrieved seems to be only a message structure that is not fully specified phonologically, and has to be further processed at a later stage of phonological specification. This is an example of tone sandhi rules being applied after the processing of all the syllables to be produced in an utterance. If tone sandhi application is considered a later step of the phonological processing in Chinese, the slip of syllable exchange certainly takes place before such phonological processing. Furthermore, sandhi rules apply even when the syllables have been incorrectly assigned tones. For example, Shen (1992) illustrated an error that involves the exchange of tones (jiěshi dài diǎn de zì 解释带点的字 'explain the underlined word' → jièshi dài diǎn de zì) where the syllables /jie/(T3) and /dai/(T4) exchanged tones, but the tone sandhi rule changed the erroneous /dai/(T3) into /dai/(T2) due to the following syllable /dian/(T3).

In example (5), the two syllables of the word *shaixuan* 筛选 'sift-select' carry a T1 and a T3 respectively. When the two syllables switch positions during the retrieval of phonological information, the tones of these syllables remain in the original serial order (i.e., *shai*(T1)*xuan*(T3) → *xuan*(T1)*shai*(T3)). One explanation for this error is that the speech mechanism has processed every phoneme, syllable and tone correctly, but that the two syllables involved were simply mispositioned during articulation. An alternative explanation is that while the speaker was retrieving the phonological information of the word *shaixuan* 筛选 'sift-select', another word of the same semantic content, but with a reversed morpho-syllabic order (*xuanshai* 选筛 'select-sift'), was also activated. As a result, the speaker used the tone of one word and the segmental sequence of another, which further indicates the independent and autosegmental feature of tones.

The above errors are what some researchers (e.g., Stemberger, 1992) call "contextual errors", because there is something in the context that looks or sounds like the source of the error. That is, the tone of a syllable in the context "contaminates" the tone of a target syllable in an utterance. For example, the tone of /ge/ (T2) in (1) may be the source of such "tonal contamination", resulting in the tonal error of /jia/ (T2). Such tonal interference between neighboring syllables can be mutual. That is, one syllable maps its tone onto a neighboring syllable, which in turn moves its designated tone to the source syllable. In this case, a tone exchange is the result, as is seen in Example (5) above. However, it is not easy to determine the source of some errors that involve tones, since the source of the error is not in the target sentence. Such errors, however, usually involve a semantically related lexical item that bears a different tone or tonal pattern, similar to the blending errors discussed in Chapter 3. Blending errors involve a combination of the target speech segment and an intruding segment, usually from a semantically related word. Tonal

errors can also involve a semantically related lexical item, blending the tone of the target word with the phoneme of the intruding word, or vice versa. The following examples demonstrate these processes.

- (6) tā yǐwǎng bú zhèyàng → tā yǐwáng bú zhèyàng
 他以往不这样
 'He was not like this before'
- (7) wǎng hòu zǒu → wǎng hóu zǒu
 往后走
 'go backward'
- (8) shū zhǎo bú dào le → shū zhǎo bù dào le
 书找不到了
 'cannot find the book'

Examples (6) through (8) are non-contextual errors which involve non-observable entities that influence the tonal features of the target utterance. The third-tone syllable /yi/ in *yiwang* 以往 'before, in the past' in (6) would normally be changed to T2 before another T3 syllable like /wang/ (i.e., yi(T2)wang(T3)). But in the error, it is the second T3 /wang/, not the first T3 /yi/, of the word that is changed to T2. The tone deviation from the target appears to be a switch of tones between the two syllables in the word. While there is no obvious reason for the tonal change in the context, the tone pattern of another activated lexical item *yiqian* 以前 'before, in the past' seems to be the cause of such an error. Note that the two words *yiwang* 以往 'before, in the past' and yi(T3)qian(T2) 以前 'before, in the past' share semantic and phonological similarities, which link the two words closely on the chain of nodes in terms of activation threshold. The second syllable /wang/ in the target word *yiwang* is a third-tone syllable before which another third-tone syllable has to undergo a sandhi rule to become a T2, while the second syllable /qianT2/ of the interfering word *yiqian* does not require the tone change of its preceding syllable /yi/. Once the

two items are activated simultaneously and are competing for articulation, the speaker has applied the tone pattern of the word *yiqian* (T3-T2) in the articulation of the word *yiwang* (T3-T3), resulting in the error *yiwang* (T3-T2).

Example (7) involves the tone change from T4 to T2 in the syllable /hou/. There does not seem to be a tone sandhi rule that is applicable in this case, and there is no obvious reason why the syllable /hou/ changes from T4 to T2. As the speaker explained, two sentences were in the mind of the speaker: *wang hou*(T4) *zou* 往后走 'go backward' and *wang hui*(T2) *zou* 往回走 'return, go back'. The two competing sentences are semantically similar, and both can convey the speaker's intention; they differ in one syllable – the target T4 syllable /hou/ and the intruding T2 syllable /hui/. It seems that the speaker first planned to utter *hui* with a second tone, but changed his mind and uttered *hou* instead; he still used the tone of *hui*, hence the error.

Example (8) involves the interaction between two aspectual markers: *dao*(T4) 到 and *zhuo*(T2) 着, the two of which have similar syntactic functions and are phonologically close to each other. As discussed with respect to example (7), the error in example (8) is caused by the competition between two syllables which results in the combination of the phonemes from one item and the tone from the other. Note that the negative marker *bu* can be pronounced either with T2 or T4, depending on the tone of the following syllable. The word *bu* carries a T4 if followed by a T1, T2, or T3, but will carry a T2 if followed by a T4 (see Chao 1968). Therefore, when the T4 syllable *dao* is changed to T2, the preceding syllable *bu* is automatically changed to T4.

The discussion of tonal errors suggests that there are different levels in speech production at which a tone error is likely to occur. Some tonal errors (e.g., (1) through (5)) may involve misplacement of either tones or the syllables originally carrying these tones in serial order. This type of tonal error may not signal a malfunction at the upper level of speech planning. Garrett (1975, 1980, 1988) proposes that sentence production is processed at two independent and serially ordered levels, a *functional level*, where an underlying grammatical representation of the sentence to be spoken is constructed, and a *positional level*, where the phonologically specified morphemes are arranged in the right order for the spoken sentence. If Garrett is right about his two-stage model of speech production, then such tonal errors in Chinese should be categorized as errors at the *positional level*; this is a later stage in the speech production process. Evidence has shown that phonological rules such as tone sandhi rules apply only after lexical items have been retrieved from the lexicon. However, some tonal errors may indeed occur at the lexical level, an earlier speech planning stage of the production. Examples (6) through (8) suggest that the speaker is processing more than one lexical item in the production of a single item. The items being processed may be either phonologically or semantically similar to each other, or both, and thus have similar activation force to be triggered for articulation. Examples (6) through (8) involve a covert interaction between the simultaneously processed lexical items. That is, no segments of a syllable are moved in the target word, just the tones. For example, the tonal error *yi(T3)wang(T2)* (Target: *yi(T3)wang(T3)* 以往 'in the past') in (6) could be best understood as being due to the influence of the word *yi(T3)qian(T2)* 以前 'before, in the past', even if the speaker had not explained what he was thinking while uttering that word.

However, there are errors from my data that show overt lexical selection involving tonal changes. That is, the perceptible tonal change of one particular syllable clearly indicates that another item with a different tonal pattern has interfered with the speech plan, as shown in examples (9) and (10) below:

(9) *dá* — *dǎ rèshuǐ*
 打 — 打热水
 ‘get hot water’

(10) *zài dǎ mǎ shàng* — *dà mǎ lù shàng bié pǎo*
 在打马上 — 大马路上别跑
 ‘don’t run in the (big) street’

The examples above show tonal changes due to the change of choice among lexical items. The speaker of (9) was hesitating in the lexical selection between *shuǐ*(T3) 水 ‘water’ and *re*(T4)*shuǐ*(T3) 热水 ‘hot water’. Note that the syllable /da/ has an underlying third tone (T3), and has to be changed to T2 when followed by another T3 syllable /shui/ through the tone sandhi rule. The speaker first intended to utter *da*(T2) *shuǐ*(T3) ‘to get water’, but immediately changed to the other choice *da*(T3) *re*(T4)*shuǐ*(T3) ‘to get hot water’ (which is the more precise item) before the first choice was fully pronounced.

Example (10) shows that the tonal change does not involve only one particular syllable in a word or a phrase; the tones for an entire phrase can also be changed to the tones (or tone group) of another phrase. The speaker of (10) intended to say something like “Don’t run in the (big) street.” The phrase “in the (big) street” in Chinese can be said in at least three ways:

- a. *zai*T4 *ma*T3*lu*T4 *shang*T0 (在马路上)
- b. *da*T4 *ma*T3*lu*T4 *shang*T0 (大马路上)⁵
- c. *zai*T4 *da*T4 *ma*T3*lu*T4 *shang*T0 (在大马路上)

It is likely that the speaker had all the three phrases in mind during speech planning, but decided to use (b). However, this target seems to be greatly influenced by the other two choices. The tonal pattern of the phrase ‘in the (big) street’ in (a) is identical with that in (b) (i.e.. T4 T3 T4 T0), and the tonal pattern for the same phrase in (c) is different (i.e.. T4 T4 T3 T4 T0.....). Due to the close interaction between these tone pattern choices, the speaker eventually uttered the phrase with the tone pattern of (a) and (b), since they are identical, but with the segments of (c) (the syllable /lu/ in (c) is a T4 syllable and does not fit into the selected tone pattern of (a) and (b), and is therefore deleted in the actual utterance), hence the error.

The above discussion clearly shows that tones in Chinese behave independently of other phonological features of the syllables they are attached to in the production of utterances. Such autosegmental features of Chinese tones lend much support to the idea that segments (including tonemes) are not seen as being arranged in a linear order, but are rather scattered in some designated fashion over the multiple tiers. Therefore, autosegmental phonology can be supported by the study of speech errors in tonal languages such as Chinese. In fact, some seemingly similar errors can also be found in non-tonal languages such as English, in which intonation and stress errors are common. For example, Cutler (1980) notes that a correctly produced sentence involves the successful imposition of suprasegmental features at several points in a word or a syllable, including the assignment of primary

⁵ In colloquial oral Chinese, the localizer *zài* 在 ‘to be at/on/in/...etc.’ can sometimes be omitted, particularly when it is at the beginning of a phrase or a sentence, and hence functioning as topic, such as the sentence in (10).

lexical stress to the correct syllable of polysyllabic words. But errors arise at many decision points in real speech. Like speech errors of other kinds, intonation and stress errors over phrases are quite common, many of them are also detectable. For example, *ambiguity⁶* → *ambiguty* (indicating that the source of influence is from the word *ambiguous*); *advantageous* → *advant...* (the source of influence is from *advantage*) (see Cutler, 1980). But there is a fundamental difference between stress errors in English and tonal errors in Chinese. A change in stress (other features being unchanged) does not hinder the listener's comprehension of the basic meaning of a polysyllabic word in English in the desired context (e.g., *abstract* vs. *abstract: export* vs. *export*). No matter where the stress is put in a word such as *impossibility*, no one would understand it otherwise. In Chinese, however, the change of the tone can result in a complete change of the meaning for a word, hence the meaning of the sentence. For example, if the Chinese sentence *ta(T1) chu(T1) jia(T4) le(T0)* 她出嫁了 'she has got married' is pronounced as *ta(T1) chu(T1) jia(T1) le(T0)* 她出家了, the listener will well understand it as 'she has become a nun'. Since there are four different tones in Chinese, plus a neutral tone, the chance for a target syllable to be pronounced with a wrong tone is much greater than stress errors in English, which varies largely between *stressed* and *unstressed*. This is another point where we see that speech errors in different languages do not occur at the same rate, at least in certain linguistic features.

4.3 The logo-phonographic features of Chinese characters

Previous classifications of Chinese speech errors (e.g., Zhang 1990; Moser 1991; Shen 1992) cover most types of errors (such as *anticipation*, *perseveration*,

⁶ The letter in boldface indicates the primary stress of the word.

exchange, *blends*), but they do not account for speech errors of all kinds. One type of speech error cannot be assigned to any of the previously mentioned categories. These errors have no obvious phonological, syntactic, or semantic “relatedness” to the target. Their systematic deviation from their targets seems to fall into a pattern of a special kind. This type of speech error involves not only the sound system of Chinese, but also the Chinese writing system and the special characteristics of the corresponding Chinese characters in the orthographic system. As this type of error is related to both the “meaning” (or the “logo”) and the sound (or the “phones”) of the word involved, I will term these errors *logo-phonographic errors*. Before my discussion on any errors of this type, I give a brief account of the written structure of Chinese characters.

Most Chinese characters can be classified into three categories according to the parts of a character. As described in Fok and Bellugi (1986), the three categories that Chinese characters fall into are *pictograms*, *ideograms*, and *phonograms*. Pictograms refer to the characters derived originally from pictures (e.g., *ri* 日 ‘sun’ derived from a circle with a dot inside). Ideograms are characters with two or more semantic clues that hint at the meaning of the character (e.g., *ming* 明 ‘bright’ formed by *ri* 日 ‘sun’ and *yue* 月 ‘moon’). Phonograms contain a semantic component and some phonetic clue to the pronunciation (e.g., *feng* 枫 ‘maple tree’ formed from *mu* 木 ‘wood’ and *feng* 风 ‘wind’). DeFrancis (1989) summarizes the structural classification of Chinese characters as pictographic, simple indicative, compound indicative, and semantic-phonetic compound. Leong (1986) provided a more detailed description of Chinese character formation, classifying characters into six different categories. He not only explained the formation of *loan characters* and *analogous characters*, which are not listed in the above classification, but also further divided *ideograms* into (*single*) *ideographs* that indicate ideas (e.g., *shang* 上 ‘up’, *xia* 下

'down') and *compound ideographs* which are formed on the basis of associations of ideas suggested by their constituent parts (e.g., *lin* 林 'forest' which is the doubling of *mu* 木 'tree', and *ming* 明 'bright' in the above example). In either description, it is clear that Chinese characters can be formed with radicals or parts which are themselves individual characters with their own phonological representations. Among all types of characters, 80 percent or more are phonetic compounds (see Leong 1986) consisting of a radical which gives information about the meaning and another component which gives information about the sound of the character.⁷ The first is called the *signific*, while the second is called the *phonetic* (see Flores d'Arcais 1992). A radical can be a complete character, that is, it can be independently used; it can also be a *signific* or a *phonetic*, depending on its position in a character (left, right, top or bottom). For example, the character 米 /mi/ can be an independent character by itself, meaning 'rice, food'. Even as an independent character, it can be a radical or a component of a more complex character, either on the left side as a *signific*, providing information about the meaning (e.g., 粉 /fen/ 'flour, powder': 糕 /gao/ 'cake': 粥 /zhou/ 'rice porridge'), or on the right as a *phonetic*⁸ to provide information about the sound (e.g., 咪 /mi/ 'mew'; 麋 /mi/ 'elk'). Sometimes it can be just a part somewhere in a character, acting neither as a *phonetic* nor as a *signific* (e.g., 类 /lei/ 'kind, type'; 奥 /ao/ 'profound'). The properties of a character are

⁷ A radical here refers to a fixed set of strokes that forms part of a character. It usually gives a specific meaning of the character, and many of them are themselves complete characters (e.g., 口 'mouth' vs. 吃 'eat' and 唱 'sing') though some can only form a character in combination with other components (e.g., 氵 'water/liquid' vs. 河 'river' and 酒 'wine', 艹 'grass' vs. 花 'flower' and 菜 'vegetable'). A component here means a major part of a character that may itself be a complete word that contains a radical of its own (e.g., 昌 'prosperous' in 唱 'sing' that contains 日 'sun'), or provides the phonetic information of the character (e.g., 口 /kou/ 'mouth', 扣 /kou/ 'button'). Given that there is an overlapping between radicals and components (i.e., some radicals can be components and vice versa), I will interchangeably use the terms *radical* and *component* to mean a *part* of a character in the discussion.

⁸ Despite the major left-right positions for significs and phonetics respectively, they may not have fixed position in a character. That is, they may not remain of the left or right of a character. Sometimes it is difficult to predict their positions.

usually distributed into the different parts contained in a character. The left part is a likely cue for meaning, such as 米 /mi/ 'rice' in the word 粉 /fen/ 'flour', while the right part is a likely cue for the pronunciation, such as 分 /fen/ 'divide' and 羔 /gao/ 'lamb' respectively in the words 粉 /fen/ 'flour, powder' and 糕 /gao/ 'cake'. As can be seen, the phonetic compounds take on the sound of the phonetic of the character. However, it should be noted that a great majority of characters were formed many centuries ago and hence the phonological information they supply reflects the phonology of that early time, not always applicable to contemporary pronunciation, especially in the case of Mandarin. The phonetic relationship among these compounds sharing the same constituent symbol is best described as belonging to the same group in traditional Chinese rhyme classification (see Leong 1986).

Given that these logo-phonographic features of the Chinese writing system play an important part in language perception tasks like reading and word recognition, which may be taken for granted by native Mandarin speakers, these features also get involved in the process of speech production, particularly when the sound of the character differs from the sound of the phonetic, as illustrated in the examples below:⁹

- | | |
|--|------------------------------------|
| (11) chǔn chǔn yù dòng 蠢蠢欲动
'ready to make trouble' | → chóng (虫 'insect') chǒng yù dòng |
| (12) lín cì zhì bǐ 鳞次栉比
'arranged row after row' | → lín cì jié (节 'section') bǐ |
| (13) hěn yòu rén 很诱人
'very attractive' | → hěn xiù (秀 'elegance') rén |

⁹ The graphical representations (characters) of the errors in the examples are provided with a gloss to show that their meaning is unrelated to the target or much less related than their written structure.

- (14) *bǎ tā jiū chū lái* 把他揪出来
‘pull it out’ → *bǎ tā qiū* (秋 ‘autumn’) *chū lái*
- (15) *fēng chí diàn chē* 风驰电掣
‘as swift as wind and lightning’ → *fēng chí diàn zhì* (制 ‘control’)
- (16) *jīng jīng yè yè* 兢兢业业
‘cautious and conscientious’ → *kē* (克 ‘gram’) *kē yè yè*

In examples (11) through (16), the actually produced items and the intended items are not related phonologically or semantically, and no syntactic rules appear to be violated in the uttered speech. However, they show a systematic change from the intended to the actual speech in terms of their written structure. When reading these characters, one can easily see whether a character is a pictogram, an ideogram, or a phonogram (if these characters are known to the reader) as well as its lexical content. But in spontaneous speech, how does a speaker relate an intended lexical item to another item that is not similar in phonological, semantic or syntactic terms? If an error and the target are not related in any way (linguistically or cognitively), they are less likely to be competing with each other during lexical selection, since they do not share the same activation passage in these aspects. There must be some factor that triggers the change from the target to the error.

One explanation is that Chinese speakers mentally visualize their planned speech segments during the lexical retrieval of phonological information before the utterance is made. Note that in such errors, it is often the case that the phonological representation of only one particular part, or one radical, of the target word (in written form) is produced rather than the whole word (or the whole character). This seems to suggest that, in the course of lexical retrieval, some of the selected lexical items are also visualized in their written form before articulation; a certain part of the

written form of the intended speech unit represented by a character provides a visual stimulus, which in turn activates the articulatory system to produce the sound that represents that visualized part of the targeted word. For instance, in example (11), the first word *chun* 蠢 ‘stupid’ has a written form which contains the top part *chun* 春 ‘spring’ and the lower part consisting of two identical radicals *chong* 虫 ‘worm’ which are themselves individual characters. When the speaker’s speech production mechanism is processing the word *chun* 蠢, the whole character for the word may be visualized in the speaker’s mind. However, in the course of such mental visualization, the lower part of the word is visualized prior to the rest of the word, possibly due to the emphatic duplication of *chong* 虫, giving more visual stimulus to the speaker’s articulatory system. Hence the change from *chun* 蠢 to *chong* 虫. In the course of such a sound change from /chun/ to /chong/, the tone of the target syllable (T3) remains unchanged, and the first /chong/ appears to be a T2 because it is followed by another T3 syllable, which is its own reduplicant. Similar tone retention also takes place in example (16), where the syllable /ke/ underlyingly carries a T4. This phenomenon further indicates that tone is a feature separable from the syllable it is associated with, as discussed earlier in this chapter.

Similarly, when the speaker processes the word *zhi* 疍, which is the third syllable in example (12), it appears to be the right part of the word’s written form 疍 that is visualized first. Since this syllable part has its own phonological representation /jie/, it is a stimulus to the articulatory system. Therefore, this partially visualized item is uttered as *jie* instead of *zhi*.¹⁰ In example (16), the two separable

¹⁰ Some Chinese dictionaries give an alternative reading /jié/ for the character 疍, which makes one wonder if the speaker is making an error or using the alternative reading. However, the regular reading /zhì / is used and expected as the only reading among most speakers, including the person who had made this “error” and quickly corrected himself. Therefore, I consider the reading in (12) an error rather than a deliberate choice for the alternative reading of the target word.

parts of the word *jing* 兢 are identical. Whichever part is visualized first, the result leads to the same error: mispronouncing *jing* 兢 as *ke* 克. However, since the speaker has already had the tone pattern of the phrase in the speech plan (i.e., T1 T1 T4 T4), the visualized item *ke* (T4) still carries a first tone, that of the target syllable *jing* (T1).

In example (13) (*you* 诱 → *xiu* 秀), *xiu* 秀 is both an independent character itself and a radical which provides phonetic clues for other words (as in *you* 诱). Similarly, *qiu* 秋 in (14) is both an independent word and a phonographic component of *jiu* 揪. It seems obvious that the phonetic clue in these two examples is taken as the pronunciation of the entire word, while the semantic component is neglected, or taken for granted, by the speaker.

Among normal speakers, there are those who consistently mispronounce certain words. For example, one may mispronounce the word *qieyi* 惬意 ‘pleased/delighted’ as *xiayi* 狭意 every time it is uttered, probably because that particular lexical item is wrongly acquired in the first place and is stored that way in the speaker’s mental lexicon¹¹. In other words, a speaker may make such errors without realizing that they are errors, and that these “errors” are exactly what they intend to utter. Therefore, these errors may not be real speech errors, or can be regarded as errors made in the course of the acquisition of these items, not in the course of producing them.

However, during the collection of my data, speakers of such errors are often found to be aware of both the “correct” pronunciation and the “incorrect” one, in that

¹¹ In fact the erroneous pronunciation of this particular word has become so common, since it often occurs in TV, radio shows, and movies, that it is tending to become accepted as non-erroneous.

they usually correct themselves by repeating the target sentence with the standard pronunciation. Examples (17) and (18) below are illustrations of this phenomenon.

(17) tā jīngcháng xiōng — xùjiǔ 他经常凶 — 酗酒
 ‘he is alcoholic’

(18) zhōngyú lòi chū pòdìng — pòzhàn 终于露出破绽 — 破绽
 ‘(he) finally showed (his) flaws’

In example (17), the speaker clearly, but incorrectly according to standard Mandarin, produced *xiōng* 凶 before changing to the correct pronunciation *xùjiǔ* 酗酒 ‘alcoholic’. Similarly, the speaker of (18) immediately corrected himself after realizing that he had mispronounced *pòzhàn* 破绽 ‘flaw, loophole’ as *pòdìng* 破定. Even if an error of this kind is not corrected by the speaker soon after it is made, the speaker usually feels that an error has been made. For instance, example (15) (*fēng chí diàn chē* 风驰电掣 ‘as swift as wind and lightning’ → *fēng chí diàn zhì* (制)) was produced by a university student in a casual conversation. After the error occurred, all parties to the conversation fell silent for a moment, realizing that an error has been made but would not mention it to avoid embarrassment. Later on, the speaker explained that he too had noticed the error, but did not correct it, hoping that it would pass unnoticed. Errors like these should not be regarded as the result of dyslexic speech, in which written words are consistently mispronounced. Deep dyslexia and developmental dyslexia usually involve traumatic or developmental disorders, while the speech errors discussed here mainly show a slip of the tongue in speech processing for normal speakers. From my personal experience in daily conversations in Chinese, such errors are accidental (not systematic), and they usually provoke understanding laughter from both the speaker and the listener. Such examples show that speakers who make such errors usually have the correct phonological

representation of the word to be produced in their mental dictionary, and it is just produced wrongly under the influence of the graphic structure of the words concerned.

Speech errors like those mentioned above involve the speaker's knowledge of the written form of the language. This shows that not all linguistic knowledge derives from speech alone. Literacy is highly valued and widely spread in most cultures and language communities; the speaker can hardly avoid exposure to the written form of the language (see Derwing *et al.* 1995). Literacy exposure of this kind influences not only the process of reading and writing, but also that of speaking as well. That is, the spoken form of a lexical item can be associated with its written form to the literate speaker, and the retrieval of the spoken form can sometimes trigger the retrieval of the written form through mental visualization. Mental visualization therefore seems to be a processing stage in the course of speech production. For example, on many different occasions (over twenty times in the last two years) when I have to spell out my name upon request, I try to pronounce each letter in my name clearly (Y-A-N-G-), only to find the inquirer writing down WANG, or asking to confirm it with a question like "Y-A-N-G-, so, you are Mr. Wang?" One might think that English speakers may be more familiar with Chinese names like *Wang* than *Yang*, but my understanding is different. When the letter *y* is heard, an English speaker may associate the sound [wai] with the spelling of such English words as *why*, *white*, *wipe*, *wife* that begin with the letter *w* (through mental visualization). Otherwise it is difficult to explain why *w* is the output while *y* is being pronounced by the speaker and repeated by the listener. Auditory stimulus can be processed visually in the mind (not through the eyes) in speech perception, and lexical items can be mentally visualized for phonological information in speech production. My personal experience told me that, when a Chinese person is asked

about his or her name, the answer is often a specific one, such as *gong-chang zhang* (弓 - 长 张) or *li-zao zhang* (立 - 早 章) (if the addressee's name is *Zhang*). Some would even spell out the character by strokes in the air. This seems to indicate that an uttered speech sound can be represented visually in the speaker's mind. The examples given above show that the error is often part of the target word in the visual form in Chinese, but this mental visualization process may also involve English speakers. For example, the silent letter *s* in the English word 'debris' [ˈdebrɪ:] can sometimes catch the speaker's "mental eye", resulting in the wrong pronunciation [ˈdebrɪ:z] (Hoppe, personal communication).

But certain questions need clarification as to why certain parts of a character give more visual stimulus than others, and whether all the lexical items involved in an utterance go through the process of such mental visualization. Some answers are readily available from various studies of lexical activation during word recognition for Chinese characters. Many experiments have been conducted to investigate the factors that affect the recognition of words in logographic writing systems such as Chinese (e.g., Flores d'Arcais 1992, Cheng 1992, Zhang & Peng 1992). That semantic information and phonological information are represented in two different parts of many characters allows us to assume that the different processing steps of a character to be uttered are taken separately by a speaker. Flores d'Arcais (1992) conducted an experiment to find that phonological information seems to become available prior to the full availability of semantic information. For example, when subjects are shown the phonetic radical of a character (with the semantic radical covered) followed by the whole character, the recognition of the character is significantly faster than when the semantic radical is shown first. This suggests that subjects are more ready to take in the phonological information of a given character. When the phonetic radical represents a sound that differs from that of the whole

character of which it is a part, speakers sometimes still seek for the phonological information from this radical, leading to the mispronunciation. The error examples in (13), (14) and (17) provided above are accounted for by this description. When these radicals become valid cues for a reader (if processed visually) or a speaker (if processed mentally), one would expect the left radical to provide information about the meaning of the character, and the right radical information about the pronunciation of the character. Thus, although both radicals are scanned in a single fixation, the contribution of the two parts to the recognition process can be taken as separate. This explains why the phonetic radical of the mentally visualized character is accessed before the whole character, and prompts the pronunciation of that radical, rather than the whole character. In naming or recognizing the written word, a reader has to look for cues to get both semantic and phonological information in order to name the given character correctly both in sound and meaning. In the course of speech planning, the speaker knows what to express by selecting the right lexical items. The major task of the speaker at this stage is to produce the correct phonological representation of the selected word in mind. Therefore, phonological activation seems to be a priority in the course of speech production, while retrieval of semantic information of the mentally visualized word is already done. The speaker thus tends to jump at the first phonological cue from the radical that gives the most visual stimulus.

It is not likely that a speaker visualizes all the lexical items selected for speech production, for such a mechanism would make the already complicated speech production process too complicated. Mental visualization is applied only when the speaker fails to phonologically specify the selected lexical items, and hopes to find the phonological clue from the visualized character. Since the semantic clue of the character is not needed at this stage, it is natural for the phonetic clue to be

activated before the whole character. This explains why the phonetic radical is sometimes taken as the whole. Note also that the mispronounced words (or characters) in such errors are usually literary or are less commonly used in daily speech. Illiterate speakers or young children who have not acquired or learned them will not choose to use such words in their spontaneous speech and are therefore highly unlikely to make errors of this kind. Only people who feel they know how to use these words (both in the written and spoken forms) may choose to use them in their speech, and once they fail to retrieve the phonological information from their lexicon, they may mentally visualize the radicals for help.

Although the majority of modern Chinese characters are phonetic-logographic compounds, each of which consists of at least two main radicals, only a small number are high frequency words (see Leong 1986, Cheng 1992). Zhang & Peng (1992) suggest that in the lexicon, some characters have stronger associations than others. Higher frequency words establish stronger associations than the lower ones. The mispronounced radicals in my data are mostly high frequency words themselves, that is, they are generally more frequently used than the characters they are a part of. For example, *xiong* 凶 'ferocious' is more frequently used than *xu* 酗 'to abuse (alcohol)'. *ke* 克 'gram' is more often used than *jing* 兢 'diligent'. *zhi* 制 'control' is more often used than *che* 掣 'swift (as lightning)'. Hence they are more easily accessed phonologically by the speaker.

This discussion has shown that speakers of Chinese, influenced by the logographic structure of the Chinese characters and the distribution of radical properties, do experience a processing step of mental visualization. In the course of such visualization, the different radicals are processed separately, with the phonetic radical being processed first. Such radicals, usually independent and high-frequency

characters themselves, have stronger associations and are more easily accessed than the target characters of which they are a part. Thus, they are easily retrieved phonologically and occur in errors of this type. This analysis gives support to Zhang & Peng's (1992) assumption that Chinese words or characters are decomposed in storage in the Chinese lexicon. It is clear that Chinese characters contain many phonetic elements which may be exploited in reading. But these psycholinguistics principles will also need to be used by speakers in accessing the internal lexicon.

4.4 Speech Errors and Bilingualism

Researchers of speech errors have mostly been studying speech behavior and its theoretical implications based on the analysis of errors that are found in the production of a speaker's native language. Error research has been mainly focused on the grammatical rules of the language and their interaction with the speaker's cognitive activity in the course of the speech production of the speaker's mother tongue. However, bilingual speakers tend to make bilingual errors, and speech errors made by Chinese-English bilinguals have rarely been addressed from a psycholinguistic perspective. Some speakers, when speaking their native language, make speech errors that are caused by their knowledge of another language. Such speech behavior is different from what is known in sociolinguistics as *code-switching*, or *code-mixing*. Code-switching involves a situational change in language alternation, mostly for sociolinguistic, socioeconomic or sociopolitical purposes. Code-mixing, on the other hand, involves language alternation that takes place intra-sententially, with the linguistic units used during the transition from one language to another including words, phrases, and clauses (see Sridhar & Sridhar 1980). The daily speech that contains bilingual speech errors, however, requires no situational change, does not necessarily serve sociolinguistic or sociopolitical purposes, and

does not have to involve transition from one language to another. The errors here take place not only within a sentence or a phrase, but often within a word or a syllable. For example, native speakers of Chinese who are also fluent in English make speech errors when they talk either in Chinese or in English. In the following examples, I underline the target, the error, and the source of the error from another language.

<i>target</i>	<i>error</i>	<i>source</i>
(19) <u>mǎi</u> sān ge 买三个 ' <u>buy</u> three'	→ bǎi sān ge	buy
(20) fàng de tài duō 放得太多 ' <u>put</u> too much'	→ pù de tài duō	put
(21) tā yǒu yì zhāng yuán liǎn 她有一张圆脸 'she has a <u>round</u> face'	→ ... ruǎng liǎn	round
(22) qù tài guó 去泰国 'go to <u>Thailand</u> '	→ qù tài lán	Thailand
(23) niú nǎi shì wēn de 牛奶是温的 'the milk is <u>warm</u> '	→ niú nǎi shì wō de	warm
(24) kàn zhè ge shū 看这个书 'read this <u>book</u> '	→ kàn zhè ge bū	book
(25) zhè ge gǒu ... 这个狗 'this <u>dog</u> ' ...	→ zhè ge dǒu ...	dog
(26) bié xiǎng dī lài 别想抵赖 'don't try to <u>deny</u> '	→ bié xiǎng dī nài	deny
(27) nǐ zǒu bù zǒu 你走不走 'you <u>go</u> or not <u>go</u> '	→ nǐ gǒu bù gǒu	go

Examples (19) through (26) demonstrate that native speakers of Chinese who are also bilingual in English make speech errors of a special type when talking in their native language. These errors do not show any obvious phonological and semantic interrelation between the target and the error. If the /m/ to /b/ change in (19) has anything to do with their common features of [+bilabial, -aspirated], there is no consistent similarity between /fang/ and /pu/ in (20), or between /guo/ and /lan/ in (22). Furthermore, the syllable of /ruang/ in (21) is not an accepted initial-final combination that could possibly mean anything in Mandarin Chinese. However, if we compare the erroneous segments with the English gloss of the target items, there is a striking similarity in terms of their phonological structure: /bai/ for *buy*, /pu/ for *put*, /ruang/ for *round*, /tai-lan/ for *Thailand*. This similarity between the actual utterance and the English counterparts of the intended Chinese items indicates that the speech production of one's native language can be influenced by the speaker's knowledge of a second language where items run parallel to the first language.

These errors are not the same as code switching, where a word, a phrase, or a sentence is switched from one language to another for sociolinguistic purposes. Code-switching is more or less an intended behavior in that the speaker uses it to serve for a purpose (e.g., to make a conversation easier, or simply to appear "elegant"). But the errors shown above are unintended tongue slips that are obviously caused by the interference from the sound structure of the English words that correspond to the Chinese target words in the speaker's speech processing mechanisms. It is interesting to see that the influential English terms that cause errors in Chinese are mostly single-syllable words (e.g., *buy*, *put*, *round*, *book*) which are easily "converted" into the Chinese phonological structure of a syllable (or a word). In the course of such "conversion", the English syllabic structure undergoes a "reshaping" process of eliminating the final consonants that are not allowed by the

Chinese phonological constraints. Mandarin Chinese phonology does not allow consonants at the end of a syllable except for /n/ and /ng/, or an occasional /r/. This process results in the dropping of /t/ from *put*, /d/ from *round*, /g/ from *dog*, and /d/ from *Thailand*, respectively.

Furthermore, in cases like the change from *yuan* 'round' to /ruang/, the English word *round* seems to be adopted by the speaker even though the /r/ and /uang/ combination in a syllable is not found in any Mandarin word.¹² Mandarin syllables do not contain the combination of an initial /r/ and a final /uang/, although there are similar combinations as /guang/, /kuang/, /huang/, /zhuang/, /chuang/, /shuang/. It seems that the influence from another language can break up certain Chinese phonological constraints to allow for a Chinese sound that resembles the corresponding English word. It can also be assumed that /ruang/ is a combination of two syllables: /ru/ and /ang/. This combination of two syllables into one suggests that a processing step of "mutual conversion" between English and Chinese is taking place in the course of speech production.

Thirdly, "converted" English syllables are automatically associated with the Chinese tone that is originally carried by the intended Chinese syllable. Thus, the error syllable /bai/ carries the third tone of *mai* 'to buy', /pu/ carries the fourth tone of *fang* 'to put'. Therefore, for Chinese-English bilinguals, lexical items of both languages may be stored parallel to each other, in similar semantic or phonological groups, rather than separately. This togetherness can trigger phonological misprocessing when the English counterparts of the target Chinese lexical items share certain similar phonological features, such as similar syllable onset (or initial)

(e.g., /w/ in *warm* and /w/ in *wen* ‘warm’), or similar rhyme (or final) (e.g., /ai/ in *buy* and /ai/ in *mai* ‘to buy’). Speech production in one’s native language can be influenced by the phonological structure of the related lexical items in another language that the speaker knows well.

Phonological similarities between two items in one language can also influence the production of the corresponding items in another language in different directions. A bilingual speaker’s lexical storage in two languages interact and interfere with each other, and such interference can be reflected in the production of either language. The following examples illustrate how such cross-language influence takes place in normal speech production in Chinese and English.

- (28) *tǔdòu tāng* → *xīhóngshì tāng*
 土豆汤 西红柿汤
 ‘potato soup’ ‘tomato soup’
- (29) The paper is a hundred pages → ... a hundred years
 (yè 页儿 ‘page’)

In example (28), the Chinese terms *tudou* ‘potato’ and *xihongshi* ‘tomato’ do not have overt phonological similarities, though they can be semantically related in the sense that they are both vegetables and can be used to make soup. On the other hand, there was no *xihongshi* ‘tomato’ within the speech context where contamination could have occurred. Therefore, lexical competition between the two terms within the Chinese phonological and semantic domains is not likely the cause for such an error. However, if the phonological representation of their English counterparts are compared, it is clear that the error is more likely to be caused by the

¹² In Mandarin Chinese, there are 21 initials and 38 finals and 4 tones which can form a total of 3192 different possible combinations for a syllable. However, only about half of these possible syllables are used in real speech.

interrelationship between the error and the target at the level of the interfering language. This is because of the obvious phonological similarity between *potato* and *tomato*, both having the same syllabic structure, the same stress pattern, and the same vowels in the same syllabic slots. As the speaker herself explained after the error was realized and corrected, she was “temporarily confused” by the two English words rather than their Chinese counterparts.

In example (29), the two English terms *page* and *year* cannot be seen as having any phonological or semantic relationship (except for the possibility that on each page is printed one calendar year). In Chinese, however, the lexical item that means *page* has the phonological representation /ye/ which sounds very close to the English *year*. Note that many northern Mandarin speakers pronounce this word with an additional /r/ sound at the end (i.e., /yer/), making it sound more like the North American pronunciation for *year*. Therefore, the sentence in (29) is a semantically correct expression except that the last word of the sentence is “switched” to Chinese, or is influenced by the Chinese phonological representation of the word *page*. Another interesting case is at a dinner table with an English-speaking guest who knows no Chinese. Intending to say “*Would you like to have some more shrimp?*”. I “slipped” into “*Would you like to have some more xiā?*” which puzzled the guest. I later realized that it is the English word “more” (which sounds close to the Chinese syllable /māo/ when pronounced in a rising tone) that triggers the articulation of /xiā/, since the two syllables form a lexical word máoxiā 毛虾 ‘baby shrimp’ which exactly fits into the sentence structure and the context. Similar examples are also noted by Moser (Zi & Moser 1992) when the influence of the English word “why” changed his intended Chinese utterance wèishénme 为什么 ‘why’ into *wàishénme. It seems that the parallel features of a lexical item in two languages can be converted into each other when they share some phonological similarities

The syntactic structure of one language may also influence a bilingual's speech production in another language. Like the phonological interference between two languages, syntactic interference can result in the production of a speech utterance that is not syntactically acceptable in a given language. For example, one's knowledge of English syntactic structure can influence the speech production of a Chinese sentence. Consider the following examples.

- | | |
|--|---|
| <p>(30) wǒ kāichē sòng nǐ qù xuéxiào
我开车送你去学校
'I will drive you to school'</p> | <p>→ * wǒ kāinǐ qù xuéxiào
我开你去学校</p> |
| <p>(31) wǒ bìng de hěn lìhài
我病得很厉害
'I am very sick'</p> | <p>→ * wǒ hěn bìng
我很病</p> |

The actual sentences produced in the above examples are ill-formed, and they do not follow conventional Chinese grammar. The error in example (30) may be considered to involve an omission of two words and can therefore be classified as an error of word omission, but a careful analysis of the structure shows that it is the result of application of English grammatical rules to the production of the Chinese sentence. The speaker used the Chinese verb *kai* 'to drive' (which subcategorizes for a means of transportation as its direct object, such as *kai huoche* 'drive a train', *kai tuolaji* 'drive a tractor') in the same way as the English verb "drive". The English verb *to drive* connotes the concept of both the use of the vehicle and the service to the passenger, such as *to drive the visitors around the city (in a car)*. It seems that the two lexical items, Chinese *kai* and English *drive*, are stored parallel to each other in the lexicon and are available for selection during speech planning, and the appropriate one is more likely to be activated depending on what language the bilingual speaker is using.

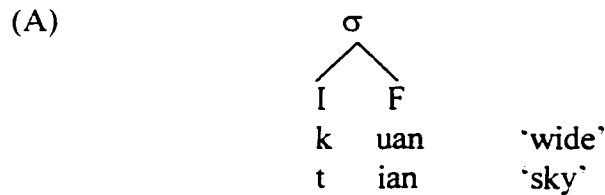
In example (31), the error sentence involves mistaking word category of the Chinese word *bing* 'to be sick' (which is a verb in this case) for that of its English counterpart *sick* (an adjective). The difference in part of speech between the two lexically related terms in the two languages leads to sentences with different syntactic structures. It is perfectly grammatical in English to say "I am very sick". but using this exact sentence pattern to express the same idea with the Chinese verb *bing* does not result in a structurally well-formed sentence. While uttering a sentence in Chinese, the speaker is apparently applying the contrasting English sentence structure, matching up English words in that sentence with Chinese lexical items: *wo* for *I*, *hen* for *very*, *bing* for *sick*.

These examples provide evidence for the assumption that two languages interfere with each other in the course of speech production for bilingual speakers. Such cross-linguistic interference further suggests that such items in the two different languages are stored parallel in the speaker's lexicon, and are readily available for selection in the course of normal speech production. Therefore, speech production seems to be processed in a non-linear and multi-dimensional way, so that more than one speech item from more than one language may be simultaneously activated to be chosen for utterance. Since the articulation of the target speech works only linearly (producing one syllable with one particular tone at a time), any malfunctioning at the planning level can be reflected in the actual speech.

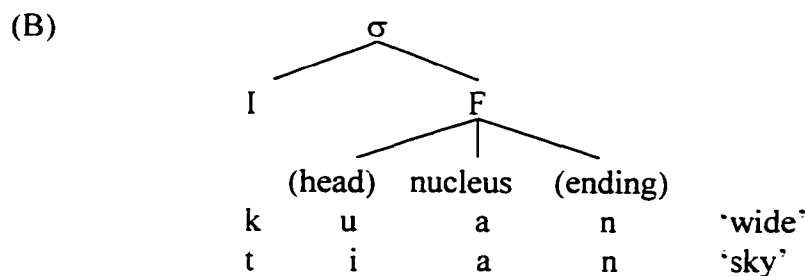
4.5 Glides and Chinese syllabic structure

There is one type of speech error in Chinese that involves the movement of glides /i/ and /u/. The patterns of such glide movement in speech errors raise

questions about the already established theories concerning Chinese syllabic structure. The syllabic structure of Chinese is traditionally described as consisting of an initial (I), a final (F), and an appropriate tone (see Chao, 1968; also see Chapter 3). Such a syllable structure can be described as follows with monosyllabic words *kuan* 寬 'wide' and *tian* 天 'sky' as examples:



In this structure, the initial contains only a consonant (a syllable that begins with a vowel is considered to have a zero initial) while the rest of the syllable (including the tone) represents the final. The formation of many Chinese secret languages, or *fanqie* language games which date back to history, is based on such a syllable structure. With the emergence of new phonological theories, scholars have "standardized" this traditional Chinese syllable structure in accordance with the well-known branching structure, which further describes the position and level of each phonemic segment in a syllable (see Fudge 1987). Such a syllabic branching structure for Chinese contains an initial (onset) and a final (rhyme), the latter in turn may contain a head vowel (pre-nuclear glide), a nucleus, and an ending (coda) which is usually an /n/ or /ng/. This structure is shown in (B) below.



This structure gives a special position to the head-vowel of the final (e.g., /u/ in /kuan/ above) in a Chinese syllable. However, if (B) is the right structure for the Chinese syllable, the head vowel of the final would be at a different level than the initial, and therefore they (the head vowel and the initial) should not be able to be moved or replaced as one single unit in a speech error. But this is not the case. In my data, a number of errors show that the initial and the head of the final do move together as one constituent, as shown in the following examples.

- | | |
|--|--------------------|
| (32) kafei hu
咖啡壶
'coffee pot' | → kahuei hu |
| (33) fenhong fenghuang
粉红凤凰
'pink pheonix' | → fenhong fengfang |
| (34) guifanhua
规范化
'standardization.' | → guihuanfa |
| (35) wo guji
我估计
'I estimate' | → wo guiju |

In example (32), when the phoneme /f/ in *kafei* 'coffee' is replaced by the anticipated phoneme /h/ in *hu* 'pot', the final /u/ also goes along with the /h/ as if they are an inseparable whole. Similarly, the phoneme /f/ of the target word *fenghuang* 'phoenix' in (33) perseveres to replace not only the initial consonant /h/ of the following syllable /huang/ (which we would expect to have the form /fuang/), but also the head vowel /u/, resulting in the error /fang/. When the initials /f/ and /h/ in two different syllables (/fan/ and /hua/) exchange positions in (34), the result is /huan-fa/ rather than /han-fua/. Furthermore, when the two vowels of the word *guji* 'to estimate' in (35) exchange, the result is not the expected /gi-ju/, but rather /gui-

that between the glide and the final. The glide is treated as a equal slot occupant in a syllable as the initial and the final.

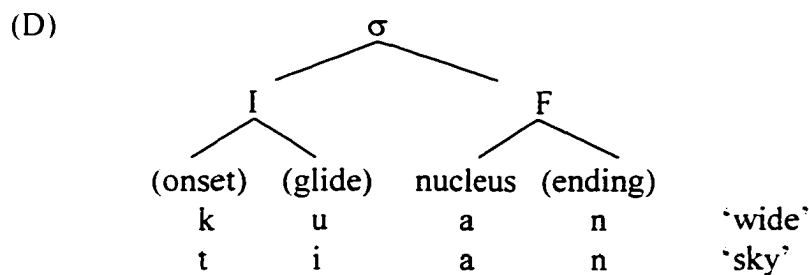
Shen's model sets the medial vowel free, and the freedom of the medial vowel allows it to be combined with either the initial or the final to form one movable unit. This is certainly a more powerful model than (B), in that the glide can be considered as associated with either the final or the initial in error analyses. However, this structure has changed the traditional initial-final (onset-rhyme) structure into a more complicated initial-medial-final structure for Mandarin syllables. Also, this structure makes the analysis of some of the errors that involve glides very ambiguous. As Shen himself points out, many glide errors in Chinese are ambiguous as to whether they are best accounted for by model (B) or model (C), as illustrated in the following errors from Shen's data.

- (36) guo bu hao shua → gua bu hao shuo
 锅不好刷
 'The pot is not easy to clean'
- (37) ming tian yao jia diar ban → ming tian yao jia diar bian
 明天要加,点儿班
 'We'll work a little overtime tomorrow'

To avoid confusion between the different terms of *medial vowel* and *head vowel*, the term *glide* is used here to stand for the prevocalic /u/ and /i/. In the above examples, (36) may be analyzed as an exchange between two finals /-uo/ and /-ua/, with the glide in combination with the nucleus (Model B), or as an exchange between two nuclei /-o/ and /-a/, with the glide independent of the nucleus (Model C). Likewise, (37) may be analyzed as a replacement of /-ian/ for /-an/ (Model B), or as a perseveration of the glide /-i/ alone (Model C). Apart from such ambiguity in accounting for glide errors, Model C still cannot explain an error like *liang dian* 两点

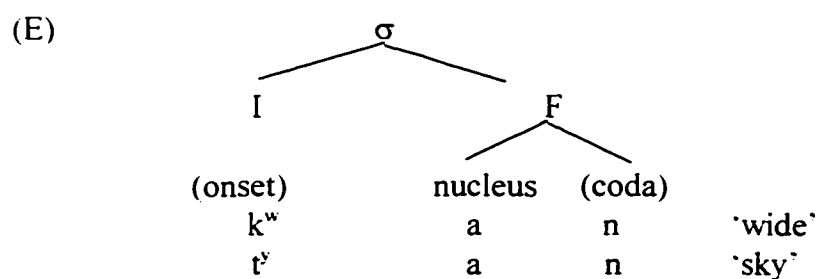
'two o'clock' → **lia diang*, where the coda /ng/ in /liang/ is shifted to replace /n/ in /dian/, leaving the glide /i/ to be together with the nuclear vowel /a/. Also, the question of whether a glide is in the onset, or in the rhyme, or between the two as an independent segment still remains unanswered in Shen's discussion.

When a structural model fails to completely account for a speech phenomenon, alternative models have to be considered. Analyses on speech errors show that slot occupants in a syllable (onset, nucleus or coda) can be replaced by or exchanged with their counterparts from other syllables. There are no glide exchanges (at least in my data) between [i] and [u] from different syllables, indicating that glides are associated with either I or F, but not free. Phonetic features in speech errors, on the other hand, are observed to be anticipated, perseverated, or replaced without changing the structure of the syllable, which matches the behavior of glides. Therefore, glides can be treated as features associated to the initial, thus reducing the complexity of Chinese syllable structures. Duanmu (1990) and Wang (1995) are in favor of treating glide as part of the onset. Note that their analyses did not give the glide a position in the branch structure such as shown in (D), since such a structure will run into similar problems as (C).



Rather, they believe that the glide features form complex segments with the onset features. They suggest that the different features of the glide (e.g., /i/ [palatal], /u/ [round], and /ü/ [palatal and round]) can be represented by a list of complex segments

with onset features. For example, the feature [+palatal] of the glide /i/ can be associated with a number of syllable onsets to form complex segments such as /b^y/, /m^y/, and /t^y/; the feature [+round] of the glide /u/ can be associated with such onsets as /b^w/, /m^w/, /t^w/, /g^w/, /h^w/, and the feature of [+palatal and + round] with such onsets as /n^w/, /l^w/, etc. Wang (1995) provides an exhaustive inventory of the possible syllable onsets and their feature description. With the glide features combined into the onset consonants, an onset consonant and a pre-nuclear glide are treated as one single consonant with glide features. Therefore, there is no extra position for the glide in Chinese syllabic structure, which is none other than the well-accepted CVC structure, as illustrated in (E).



Thus, the complicated rhyme inventory of Chinese syllabic structure is drastically simplified without necessarily tripling the number of onsets. With the application of this approach in speech error analysis, the errors that involve the movement of pre-nuclear glide can be explained rather easily without ambiguity. For example, the syllable segments /hu/ in (32), /huang/ in (33), and /hua/ in (34) have the phonological representations /h^wu/, /h^wang/ and /h^wa/ respectively. When the onset is removed or replaced in errors, the only involved segment is the onset consonant /h^w-. The word *guji* ‘to estimate’ in (35) has a phonological representation of /g^wu-j^yi/. When the rhymes of the two syllables exchange positions, the glide features of the onset consonant remain unchanged, and thus the natural result is /g^wi-j^yu/. The glide movement phenomenon in Shen’s speech error data can also be

explained in similar ways. For example, the segment exchange in (36) above can be considered an exchange of the rhyme (i.e., /-o/ and /-a/) while the onsets (i.e., /g^w/ and /sh^w/) remain unchanged. The addition of the glide /i/ in (37) can be regarded as the result of the perseveration of the glide feature [+palatal] from the previous syllable onsets in the utterance (i.e., /t^y/ in *tian*, /j^y/ in *jia*, and /d^y/ in *dian*), which caused the non-palatal /b/ of *ban* to become /b^y/. With this analysis, the actual phonological representation of the error should be /b^yan/ rather than the traditional /bian/. The perseveration and anticipation of such glide features is able to account for the addition and omission of glides as shown in Chapter 3. For example, in an error such as *Sanmao liulang ji* 三毛流浪记 ‘the adventures of Sanmao’ → *Sanmiao liuliang ji*, it is the feature [+palatal] that is spread from /l^y-/ of /l^you/ to /m-/ of /mao/, changing it to /m^y-/, resulting in the error /m^yao/, and from /l^y-/ of /l^you/ to /l-/ of /lang/, resulting in /l^yang/. The palatal feature of /j^y-/ in /j^yi/ may also play a role in the feature change of /mao/ and /lang/. Similarly, an error like *douliu* 逗留 ‘stay’ → *doulou*, the feature [-palatal] of the onset consonant /d-/ is perseverated to the next syllable, changing the palatal /l^y-/ into /l-, which results in the error /dou-lou/. In this way, the errors that puzzle Shen can be easily accounted for. For example, an error such as *zuei chou* 嘴臭 ‘mouth is smelly’ → *zou chou* can be analyzed as the result of the anticipation of not only the rhyme /-ou/ of the syllable /chou/, but also the [-round] feature of the onset /ch-, changing /z^w-/ to /z-/.

4.6 Theoretical implications

Speech errors that involve tone movement are common in Chinese. They provide evidence that speech is processed at different levels. However, speech error researchers in Chinese tend to neglect this type of error in that such errors are hard to notice, given the dialectal differences between individual speakers. On the other

hand, although tones are important phonological features in Chinese, tonal variation may often go unnoticed by the listener because of semantic and lexical biases. For example, Fox and Unkfer (1985) had Mandarin-speaking subjects distinguish the tone difference between /hei/ (T1) and /hei/ (T2). Most subjects perceived both as having a T1, because /hei/ (T1) is a lexical word (黑 'black') while /hei/ (T2) is not. Dialectal effects also make it difficult to determine whether a speaker is making a tonal error, or is using a dialect whose tonal patterns differ from Standard Mandarin. Therefore, studies of tonal errors are difficult. But it is certainly rewarding when these errors can be used as evidence for insights into language production.

Speech errors of the mental visualization type indicate separation of segmental content from lexical frames. A lexical frame is the structure of a lexical item that contains all the grammatical information about that item, such as its sound, meaning, part of speech, grammatical function, as well as its written form. These lexical frames can be taken apart in the process of lexical retrieval in speech production, leading to an erroneous utterance. Utterances with such errors usually remain well-formed in their sentential structures, and self-correction after the error has been detected usually involves adjustment of only the erroneous item, not the whole phrase or sentence. For example, the self-correction from *xiong* 凶 to *xu* 徐 involves only one particular lexical slot, or the phonological adjustment of one word, while the remainder of the sentence remains intact. This seems to suggest that mental visualization is a "character-based" processing step at what Garrett (1975, 1988) calls the "positional level", where lexical items (with their specified phonological segments) are arranged into their individual positions in a sentence structure that has been planned at an upper processing level to convey the intended message. A mismatch between the lexical frame and its segmental content may be caused by the logographic features of the Chinese characters to be mentally visualized (perhaps

part by part, or radical by radical) in the look-up process in the lexicon. Mental visualization is a stand-by mechanism which is applied only when the phonological retrieval of a selected lexical item fails. The items that tend to fail in phonological retrieval are often low frequency words that have less association, or operate at a low activation level (Stemberger 1985). It is less likely for a high frequency word to be partially visualized and mispronounced, in that high frequency words are much easier to retrieve in the course of speech production.

Speech errors of the bilingual type show the process of sentential or phrasal structuring at what Garrett calls the “functional level”, where lexical representations and their underlying grammatical relations are constructed in two languages. Although certain errors like (19) (i.e., /bai/ for /mai/ ‘to buy’) reflect only the target/error difference by one segment, bilingual errors reflect the competition between lexical items in both L1 and L2. Examples like (30) and (31) show that the intrusion of the lexical items from a second language may affect not only the pronunciation of certain segments in the target language, but also the sentence structure. These errors indicate that interference occurs between two different language structures at the sentence planning level, rather than between different inventories of phonological representations. When a speech intention is syntactically and semantically structured, it is likely done using both English and Chinese structures for some bilinguals. Such parallel structures may transfer or merge into each other where the similarity effect is the strongest. It is less likely for a speaker to map a Chinese word with an English word that is phonetically too different from the target. For example, one could hardly mispronounce a Chinese word like *yi yuan* 医院 ‘hospital’ as **hospiyuan* or **yispital*, since the target language allows no such syllable structures. Speech errors involving tones, mental visualization and bilingualism lend much support to Garrett’s assumption that speech production

undergoes two different processing levels. It is at the functional level where lexical representations are materialized in the form of the speaker's native or second language, or both at the same time, in which stage the two language structures interfere with each other, affecting the normal production of speech. It is this cross-language interference between English and Chinese that causes momentary confusion in the speaker's speech processing mechanisms, resulting in speech errors of this particular kind. At the positional level, segmental units are processed to form individual words that are to fill the phonetic slots of each lexical item in a sentence. It is the integration of these processing steps at two separate levels that assures the well-formedness of a sentence to be uttered.

4.7 Summary

Although speech errors in Chinese show many similarities with errors found in other languages, they certainly demonstrate language-specific characteristics that are not shared by many other languages. Tonal errors indicate that the speech production process may take place at different levels and in different steps. The errors can be the result of either misarticulation of a well-planned speech unit, or the result of a malfunction in the speech planning mechanism. Although tone sandhi rules monitor the well-formedness of the tonal pattern in an utterance, the interference between different lexical items that carry different tones at the upper level of the speech planning process is not under the control of the rules at the lower pre-articulation domain. The logo-phonographic errors discussed in this chapter further show the language-specific character of the Chinese writing system in relation to the speech production process. Some Chinese speakers seem to visualize the speech items in their planned speech before they are uttered. Such visualization

may sometimes be conducted only partially, leading to the articulation of a radical rather than the whole word. Speakers visualize lexical items for phonetic clues when the semantic content of the lexical item is already clear. Such errors not only show the relationship between the sound, the meaning, and the written representation for Chinese characters, they also reveal that low frequency words may take longer to retrieve and such retrieval often needs the help of phonetic clues provided by the radicals in the word's written form, which is mentally visualized by the speaker. Speech errors of the bilingual type show the different ways a language-specific feature is combined with those of another language during speech. They suggest that grammatical systems of two (or more) languages may be stored in parallel in a bilingual's lexicon, and they may interfere with each other in the course of lexical retrieval, causing errors to occur.

Speech errors that involve the movement of glides are in fact errors that involve feature movement. Although traditional analysis has treated glides as occupying a separate position in the syllable branching structure, evidence from glide errors suggests that the Chinese syllabic structure can be much simpler if glides are treated as a feature of the syllable onset rather than as part of the rhyme. The discussion of glide errors further suggests that once an appropriate analysis is reached, language specific errors can be cross-linguistically explainable.

The speech errors discussed in this chapter do not represent all kinds of deviation from the intended speech related to the language-specific properties of Chinese. There are other types of covert, or undetectable, deviations from the intended speech that may not be found in many other languages. For example, in Chinese, there are many compound words (particularly in idioms) that are formed with two elements which are synonyms, or words of the same semantic class. These

elements within the compound words may switch positions without changing their lexical content. The following examples illustrate the point (the double arrow indicates that the change can be in both directions).

- (38) a. jiànkāng 健康 ↔ kāngjiàn 健康
 'strong and healthy',
- b. jiǎngyǎn 讲演 ↔ yǎnjiǎng 演讲
 'to give a public speech',
- c. tiānfāndìfù 天翻地覆 ↔ dìfùtiānfān 地覆天翻
 'heaven and earth turning upside down',
- d. rúzuì rúchī 如醉如痴 ↔ rúchī rúzuì 如痴如醉
 'like crazy like drunk, obsessed'

A Chinese speaker may intend to say one member of the pair, but end up saying the other, achieving the same communication result (since one is equal to the other in terms of meaning). Whether such a phenomenon can be regarded as erroneous depends on how a speech error is defined. If an error is simply defined as "what is said is not what is intended", then such type of speech is indeed erroneous even though the error functions equally well as the target. Psychologists tend to favor this assertion in the sense that speech errors are caused by the change of the intention regardless of whether there is violation of linguistic rules. But from linguistic perspectives, such utterances violate no grammatical rules, and they express exactly the same idea as intended (even though it does not appear in exactly the same form as intended), and therefore they should not be considered "speech errors". Hence, speech errors are seen by linguists as "non-intended utterances that deviate from the phonological, syntactical, semantic, pragmatic or socio-cultural norms of the target". As Reason (1982) points out, the nature of an error concerns the relationship between plans, actions, and consequences. Plans determine the nature of actions that lead to

the desired consequences. But the right consequences are what the plans are designed for. If the desired consequence of the articulatory actions is achieved without exactly following the plan, there is no way for us to tell if an error differs from its target. Psycholinguistics studies how the human mind works in the course of speech production through the analyses of speech errors, but is not to judge if an utterance is "erroneous" unless it is so obvious (e.g., in cases where the speaker corrects him or herself). On the other hand, the meaning of a fixed set of expression in Chinese idioms can hardly be misinterpreted, and for poetic purposes, some speakers even deliberately shuffle the items around within a single Chinese sentence or phrase. Language-specific characteristics again play a role in analyzing "erroneous utterances."

In general, speech errors in Chinese reflect the different processing stages of speech production. Although these stages may be cross-linguistically similar in that speakers of different languages make errors in similar patterns, certain sub-stages may be applicable only to certain languages, but not others. This is why language-specific characteristics should be independently analyzed while applying a universal model of language production. As briefly introduced before, different models of speech production have been proposed based on the evidence of speech errors. The study of speech errors in Chinese may provide a testing ground for these models. Although all assumptions about the speech production mechanisms can explain why and how certain types of errors should occur in normal speech, applying these models on the analysis of Chinese errors may suggest that certain models can account for the speech error phenomenon better than others.

Chapter 5

The Socio-Cultural Aspects of Slips

5.1 Introduction

The Chinese speech errors so far have been discussed from linguistic and psychological perspectives, where language performance is treated mainly as a physical or psychological entity. However, language is more than a physical or psychological phenomenon. The purely linguistic function of speech is secondary to its role in social interaction, i.e., to its function in communication, as the principal agent for the transmission of cultural and social values. Speech errors occur not only for linguistic or psychological reasons. Many socio-cultural factors also influence the speaker's speech planning and communication performance. Like serious errors of a non-linguistic nature (which may reflect a person's absentmindedness, carelessness or a mistake in decision making caused by a past habit or recent experience), speech errors can also have serious social consequences. This is because a speaker's social place in the community, cultural background, and even political viewpoint, can be reflected in his speech performance. Speech errors that have socio-political overtones may create disturbances among listeners who share different socio-political points of view. Consideration for the listeners' potential reaction to a speech makes a speaker think twice about the social implications of his speech and plan more carefully to follow socio-cultural as well as linguistic norms. For example, when addressing a

listener, the term to be used to show both the social appropriateness of a form and its linguistic well-formedness varies from language to language and from culture to culture. If improperly used, the term may be perceived as an error in one language or culture while being totally acceptable in another. This error is not one of a purely linguistic nature, but rather reflects socio-cultural differences among speakers of different languages.

The study of speech errors can serve socio-cultural purposes. Intended use of speech errors plays an important role in people's social life, showing the speaker's talents in purveying wisdom, humor, satire, and criticism. Some intended speech errors (such as jokes and puns) can be artistically valuable, but they also show that linguistic and psychological principles are what such "treasures" are based upon. This chapter discusses speech errors in the socio-cultural domain, describing the relationship between one's speech performance and its socio-cultural sources as well as its practical consequences.

5.2 Speech Errors in Practical Life

The study of slips of the tongue has contributed to linguistic theories, but it also has important practical implications. People make slips not only in speech, but in other cognitive and physical activities as well. Although slips in linguistic and non-linguistic activities can be analyzed differently, they have similar practical implications, which can sometimes be very serious. For example, inadvertent errors have caused serious accidents. Reason (1982) has analyzed several catastrophic accidents in which fatalities were apparently caused by slips of the mind: a London bus driver crashed a double-decker bus into a low overpass, killing 6 passengers,

simply because he was in the habit of driving the same route in a single-decker bus: in 1977, a senior pilot on the island of Tenerife failed to obtain clearance from the control tower before taking off and taxied the Boeing 747 into a landing plane, killing 577 passengers and crew. The reason for this accident is believed to be that the pilot had just finished a different assignment involving hundreds of hours of training pilots in a cockpit simulator, in which runway clearance was not required. These fatal errors reflect how a highly habitual and automatic action can substitute for the correct one. Processes affecting linguistic elements, such as anticipation and perseveration in speech errors, can also be observed to affect the occurrence of non-linguistic events. Take an example from my own experience, when coming back home from school after a busy day, I often find myself opening the main entrance of the house with the key to my own suite, anticipating the event of being in the comfort of my own home. Such behavior is governed by the same mental controlling system that processes speech behavior. Any malfunctioning of this processing mechanism can lead to either slips of the mind (as in an accident) or verbal slips (as in a speech error).

Inadvertent speech errors can also have social consequences. On August 31, 1995, ABC aired its regular TV program, *America's Funniest Home Videos*. One of the video segments showed a school convocation where the speaker (a professor at the school) stunned the audience by congratulating the students on the achievement of their "tremendous amount of scholarship and tremendous amount of sex — success". A slip like this may be accepted with understanding laughter from the audience (the speaker in fact won a prize by sending the video tape to the TV series), but other slips may face severe criticism. In February, 1995, there was a series of heated exchanges on the *Linguist List*, arguing whether an American politician, Dick Armey, made a slip of the tongue or an intentional slur during an on-line speech by

referring to Barney Franks as *Barney Fag*. Despite Arney's quick correction and later explanation for the innocence of his purely phonological verbal slip, linguists and politicians largely remained skeptical about his explanation, believing that Arney was using linguistic tricks to make a political point. Critics say that people as educated as Arney could not have made an unlikely linguistic error like *franks* → *fag*, unless it was a Freudian slip, revealing what the speaker had in mind. This was purported to be obvious in this case, since Arney's anti-gay sentiment is known to the public (see *Linguist List*: Vols. 6-255 and 6-277, 1995).

Speech errors with similar consequences also occur in Chinese communities. Although I do not have any first-hand data available, some examples from unpublished sources and personal communication may help illustrate the point. During the cultural revolution in China (1966-1976), a Chinese calligrapher was punished for his "counter-revolutionary" behavior, simply because he slipped in brush-painting *wan shou wu jiang* (万寿无疆) 'a long life without limit', a very popular political slogan then to wish the Chinese leader a long life. A slip of the pen anticipated the character *wu* (无) 'no/without', replacing the character *wan* (万) 'ten thousand (years of life)', resulting in the "counter-revolutionary" *wu shou wu jiang* (无寿无疆) 'no longevity no limit'. Stories like this appear early in Chinese history, when a slip of the tongue could cost one his whole career. An emperor in the *Qing* dynasty demoted one of his senior officials simply because the official mispronounced *wengzhong* 翁仲 'stone statue' as *zhongweng* (a non-existent word) (S. T. Tuan, personal communication on *Chinese Studies List* on the Internet). Although examples like these need further verification, the point is that speech errors, like errors in non-speech behavior, can indeed have serious social consequences. From today's psycholinguistic point of view, these errors can be explained without involving any socio-political reasoning. For example, the "tragic"

slip of the pen by the Chinese calligrapher could have been the result of “recency effect”, since a calligrapher’s task in those days was to brush-paint just those few characters, which might easily form a writing habit and pre-activate the target character. Such pre-activation or recency effects influence motor control in the course of speech or writing. Experiments in other languages (e.g., Japanese) have shown that such a recency effect does indeed increase the chance of making errors (see Nihei 1988; see also Kess & Miyamoto 1994 for references). Nevertheless, the possibility should not be eliminated that one might utilize such linguistic knowledge to serve political purposes in order to bring real social consequences.

5.3 Slips and linguistic and socio-cultural differences

English and Chinese have many linguistic structures in common (e.g., CVC syllable structure and SVO word order in subject-predicate sentence structure occur in both languages), and even speech errors are made in similar patterns. Language-specific characteristics, however, determine the differences between the two languages in terms of the likelihood of certain types of errors occurring rather than others. For example, word orders in Chinese topic-comment structures may follow more patterns than the largely SVO order in English. Errors that involve consonant clusters and derivational segments are common in English, but not in Mandarin Chinese, which allows no consonant clusters within a syllable. On the other hand, errors related to tones and logo-phonological features are typical among Chinese speakers, but not so much so in English. Structural differences determine in which area of language errors are more likely to be found. For example, while it is less likely that a Chinese speaker will make errors with a personal pronoun, it is quite possible for an English speaker to make such errors (e.g., *he* for *she* or *it*, *me* for *I*),

since the specific characteristics of the language require the speaker to select the right item from among several choices in the same grammatical category. The following are a few examples from Fromkin (1973).

- (1) *Laurie's boyfriend has longer hair than she does* → ... than he does
- (2) *I told him (Peter) you were not coming in today* → I told her — him ...
- (3) *The city has a personality of its own* → ... of his own
- (4) *I gave it to him* → ... to he — him

It is obvious that the underlined items in the above sentences are pronouns in different cases and genders, and they interfere with each other in the course of lexical retrieval. However, such errors are not likely to occur in Chinese, since all the third-person singular pronouns in any gender and case are associated with one and the same monosyllabic representation /ta/. In most cases, the pronoun *ta* in Chinese can be the English equivalent of *he*, *she*, *him*, *her*, or *it*, depending on the speech context (although the written form can be different for different referents). In Chinese, there are different lexical representations for a third person singular pronoun depending on gender and case differences (e.g., male/female and subject/object), but the phonological representation of these items is the same. Even though a Chinese speaker may select a wrong reference in the lexicon, the phonological output would be guaranteed to be correct so long as the lexical item is third person singular. This suggests that an English speaker has to process five times as many items as a Chinese speaker in choosing the right pronoun from the same category. It is evident that such factors within the structural buildup of a language can determine the likelihood of error occurrence in that language.

Similar differences between languages in the probability of making errors can also be determined by socio-cultural factors related to the language involved. English speakers may make errors that are not likely to occur in Chinese, but they are very unlikely to make errors of the following kind (errors which are typical for Chinese) which involve the complicated system of Chinese kinship terms.

- (5) *ta quan kao ta de gong-gong* → *ta de yuefu*
 她全靠她的公公 她的岳父
 'she totally depends on her father-in-law' '..... her father-in-law'
- (6) *ni gege bi ni da ji sui?* → *ni didi bi ni da ji sui?*
 你哥哥比你大几岁? 你弟弟比你大几岁?
 'how much older than you is your (older) brother?' 'how much older than you is your (younger) brother?'
- (7) *ta de saozhi — xiaogu hen piaoliang*
 她的嫂子 — 小姑很漂亮
 'her sister-in-law is pretty'
- (8) *kuai jiao shushu — dada*
 快叫叔叔 — 大大
 'quick, say hello to your uncle'

The above examples illustrate confusion in the use of kinship terms in Chinese, which is sufficiently complicated that speakers sometimes retrieve the wrong item from a web of kinship terms. Although both the terms *gonggong* 公公 and *yuefu* 岳父 in (5) are equivalent to the English term 'father-in-law', they in fact have different connotations in the Chinese kinship term system. *Gonggong* refers to the father of the husband, while *yuefu* refers to the father of the wife. A married woman can only call her father-in-law *gonggong*, but not *yuefu*, while a married man

can only call his father-in-law *yuefu* but not *gonggong*.¹ The speaker in example (5) violated this pragmatic rule in her speech, hence the error.

The misused terms in example (6) are *gege* 哥哥 ‘elder brother’ and *didi* 弟弟 ‘younger brother’, both of which are the equivalent of the English term “brother”. In English, one’s brother can be either younger or older than the referent, but a Chinese speaker uses different terms accordingly. In Chinese, the relationship between *saozi* 嫂子 and *xiaogu* 小姑 in example (7) is “sister-in-lawship”. *Saozi* refers to the wife of one’s elder brother while *xiaogu* refers to a younger sister of one’s husband. These two terms are represented by one term ‘sister-in-law’ in English. The word *dada* 大大 in example (8) refers to an elder brother of one’s father, and *shushu* 叔叔 refers to one’s father’s younger brother. Since “uncle” is the term to cover both, English speakers do not run into troubles leading to errors of this kind.

Speech errors like these show socio-cultural characteristics that influence speech production. Such errors should be looked at from a sociolinguistic point of view, for in every society, the basic unit of a community is the family. Kinship terms are a major part of address terms. In English, kinship terms are relatively simple; for example, the five English terms *brother*, *sister*, *cousin*, *brother-in-law* and *sister-in-law* cover all one’s relatives of the same generation. In Chinese, however, a speaker must make clear how he or she is related to the addressee. For example, the Chinese corresponding term for the English *brother* has to be either *gege* ‘elder brother’ or *didi* ‘younger brother’, because the Confucianist principle *li* 礼 ‘propriety’ requires the younger to respect the elder. In a traditional Chinese family, the eldest child is responsible for taking care of the younger ones, and should be respected by the

¹ Different Chinese dialects may have different terms for one’s in-laws, but it is always the case that the terms are different, distinguishing the relatives of the wife from those of the husband.

younger ones. It is therefore important in Chinese to make clear “who should respect whom” in the conversation. People in some communities in China may call each other *dage* 大哥 ‘big brother’ to show respect to the addressee regardless of age difference, or just to be on the safe side. The same is true with the terms *jiejie* 姐姐 ‘elder sister’ and *meimei* 妹妹 ‘younger sister’.

The English term “cousin” covers a large range of kinship relations. In Chinese, cousins are not only distinguished with respect to gender and age differences (e.g., *biaoge* 表哥 ‘a male cousin who is older than the speaker’, *biaomei* 表妹 ‘a female cousin who is younger than the speaker’), but also distinguished by the “closeness” of the relationship. Traditional Chinese families are centered around the father (e.g., children carry the name of the father), and even cousins on the father’s side are considered closer to the family than those on the mother’s side. Such differences are clearly marked in forms of address. For example, the English term *cousin* can have different equivalents in Chinese: the morphological prefixes *tang* 堂 ‘in-house’ and *biao* 表 ‘superficial’ in kinship terms indicate whether a cousin has a closer relation to the family (a child of the father’s brother but not sister), or has a distant relationship (a child of the father’s sister or a child of the mother’s brother/sister). Such differences in kinship terms leave more choices to be processed for a Chinese speaker than for an English speaker, hence more chances for speech errors. This is because a speaker has to select the most proper term from a list of related kinship terms. The speaker of example (9) below has to make the relationship between the two referents clear in his speech and therefore has to correct any error in speech that might confuse the listener.

- (9) *tamen shi biao* — *tang xiongdi*
 他们是表 — 堂兄弟
 ‘they are cousins — paternal cousins’

The speaker in (9) has to stop short after uttering *biao*, realizing that the relationship between the cousins is fraternally related, and hence changed to *tang*. It is interesting to look at just the lexical meaning of the two affixes. *Tang* 堂, meaning “the hall (of the family house)”, indicates that brothers of the same family live in the same house and offer sacrifices to the same ancestor, a traditional family practice. If a relative term is prefixed with *tang* (e.g., *tangxiong* ‘an elder cousin’, *tangdi* ‘a younger cousin’), this relative must have paternal relations to the speaker. Those relatives prefixed with *tang* are usually those who carry the same family name as the speaker (or their spouses), indicating that these people are committed to the development of the family. On the other hand, *biao* 表 means “superficial”, and is used to refer to the cousinship with someone “outside the house”. This is because female children “belong” to other families when they grow up and are married off, and hence are no longer “real relatives”. This complex kinship system reflects the strict Confucianist principle of “group membership”, making a clear demarcation between insiders and outsiders even within the same family. The *tang/biao* differentiation also applies to relatives of different generations, making the already complicated kinship system even more complex. This system greatly increases the number of competitive choices for a Chinese speaker in the process of lexical retrieval, opening more chances for an error to occur than in English. **Table 5.1** on the next page shows a list of some kinship terms for male relatives of the same generation, which shows the one-to-many lexical matches between English and Chinese kinship terms.

Kinship terms for (male) relatives of the same generation

brother:		
<i>gege</i>	哥哥	elder brother
<i>didi</i>	弟弟	younger brother
brother-in-law:		
<i>jiefu</i>	姐夫	elder sister's husband
<i>meifu</i>	妹夫	younger sister's husband
<i>dabaige</i>	大伯哥	husband's elder brother
<i>xiaoshuzi</i>	小叔子	husband's younger brother
<i>dajiuzi</i>	大舅哥	wife's elder brother
<i>xiaojiuzi</i>	小舅子	wife's younger brother
<i>lianjin</i>	连襟	wife's sister's husband
(male) cousin:		
<i>tang-ge</i>	堂兄	elder cousin who is the son of father's brother
<i>tang-di</i>	堂弟	younger cousin who is the son of father's brother
<i>tang-jiefu</i>	堂姐夫	husband of an elder cousin who is the daughter of a paternal uncle
<i>tang-meifu</i>	堂妹夫	husband of a younger cousin who is the daughter of a paternal uncle
<i>biao-ge</i>	表哥	elder cousin who is the son of father's sister or mother's brother/sister
<i>biao-di</i>	表弟	younger cousin who is the son of father's sister or mother's brother/sister
<i>biao-jiefu</i>	表姐夫	husband of an elder cousin who is the daughter of father's sister or mother's brother/sister
<i>biao-meifu</i>	表妹夫	husband of a younger cousin who is the daughter of father's sister or mother's brother/sister

Table 5.1

Another influential factor that provides less possibility for English speakers to make errors of this type is that English speakers tend to address relatives or acquaintances by name. When the relationship between the speaker and the addressee becomes too complicated, the name of the addressee is used in place of a particular kinship term or a title. It is not uncommon to hear an English speaker call his or her seniors, or even parents, by name. This addressing pattern saves a lexical search for

the proper term, with the chance of making an error much reduced. In Chinese, however, it is considered “improper” or even “impolite” to address an older person by name. In conventional practice, interlocutors must be addressed with a kinship term (e.g., *er ge* 二哥 ‘second brother’, *san yi* 三姨 ‘third aunt on the mother’s side’), a title (e.g., *changzhang* 厂长 ‘factory chief’, *zhuren* 主任 ‘director’), or a title plus surname (e.g., *Zhang xiansheng* 张先生 ‘Mister Zhang’, *Li jiaolian* 李教练 ‘Coach Li’). A speaker has to consider social appropriateness during speech production and adjust according to the relationship between the speaker and the addressee. My data contains a few error examples of this type (some of which are shown below), which illustrate such adjustments in speech production.

(10) *Ma daifu* — *Ma zhuren*

马大夫 — 马主任

Doctor Ma — Director Ma

(11) *Ouyang lao(shi)* — *Ouyang jiaoshou*

欧阳老(师) — 欧阳教授

Tea(cher) Ouyang — Professor Ouyang

In example (10), the word *daifu* ‘doctor’ is a term used to show the profession of the addressee, but not an administrative rank as the word *zhuren* ‘director’ does. In a society where ranking is important in showing a person’s social position, it is often considered more appropriate to address someone by rank rather than by profession. The speaker obviously has in mind this concept of class distinction, hence the correction in his speech. Similarly, the unfinished item *lao-* in (11) is the first syllable of the word *laoshi* ‘teacher/instructor’, which shows only a profession but not an academic rank as the word *jiaoshou* ‘professor’ does. Following the social convention of showing respect to the old professor, the speaker changed his initial selection of *laoshi* ‘teacher’ to the more polite term *jiaoshou* ‘professor’ in the middle of the utterance.

The speech errors discussed above suggest that the socio-cultural characteristics of a language may influence speech production in a specific language environment. They also show that speakers may have different plans before the articulation of a sentence and switch from one to another which is socio-culturally more appropriate during the sentence production. In such cases, speakers are not correcting themselves in terms of the lexical items they choose, but the socio-cultural properties of these items. Therefore, English and Chinese differ not only in terms of the linguistic aspects of each language *per se*, the socio-cultural aspects of language also play an important role in determining the likelihood of error occurrence in different domains. A speaker has to consider not only the linguistic rules, but also the current socio-cultural conventions in the course of speech planning and lexical selection. If a given language has more lexical terms in a given domain, the chances for speech errors in this domain are likely to be higher than in a language that has fewer socio-cultural constraints in this area.

5.4 Speech Errors as a Source of Humor

Speech errors in normal speech are often unpredictable, in the sense that the target can be replaced by an error in many possible patterns. A target can be transformed phonologically, syntactically, or semantically, and the result can often be an unexpected utterance that is dramatically changed into something that is entirely out of the context. Such erroneous utterances can often produce laughter. Some famous Spoonerisms below show how humorous the result of a slip could be.

(12) *our dear old Queen* → *our queer old Dean*

(13) *You have wasted two terms* → *You have tasted two worms*

Speech errors as in the above examples are often found in natural speech, though there is some doubt as to whether the above examples were really unintended in the natural speech of Mr. Spooner (see Fromkin 1980). Such errors can also be produced intentionally for artistic effect. Spoonerisms like *I must go and dye a beggar for I must go and buy a dagger* were used as early as the 17th Century in European theater performances. It is not uncommon today to see the current use of intended speech errors on TV or in movies, intended errors such as *your awful wife for your lawful wife*. Such intended errors in the context are manipulated to show humor and wit, and to engage the audience directly.

Intended speech errors such as jokes are “designed” to bring about such effects. Baars (1992d) has observed that conscious priming increases the frequency of experimentally evoked slips in speech. For example, if one asks someone to repeat the word *poke* about half a dozen times and then asks, “What do you call the white of an egg?”, most people will answer “Yolk.” Although they know the difference between egg-white and yolk, they have been primed by the word *poke* to retrieve a similar-sounding word from memory. Reason (1992) has described similar instances of word games such as the following:

- (14) Q: *What do we call the tree that grows from acorns?*
A: *Oak.*
Q: *What do we call a funny story?*
A: *Joke.*
Q: *What sound does a frog make?*
A: *Croak.*
Q: *What is Pepsi’s major competitor?*
A: *Coke.*
Q: *What is another word for cape?*
A: *Cloak.*
Q: *What do you call the white of an egg?*
A: *Yolk.*

Studies conducted to investigate the effects of varying the number of “oak-yolk” primes on the naming of the white of an egg confirm the potency of the “oak-yolk” priming effect. Erroneous “yolk” answers increase with the number of prior rhyme primes. The frequency of primes, as well as the presence of common phonological elements, clearly plays an important part in determining the likelihood of the “yolk” response. In fact, studies have shown that listeners may be primed with only one phonologically similar word such as the children’s word game described in Reason (1992):

- (15) Q: *How do you pronounce the letters S-H-O-P?*
A: *Shop.*
Q: *What do you do at a green light?*
A: *Stop.*

Such kind of “*shop-stop*” reaction from the speaker in a certain speech setting can be quite entertaining. This is how intended speech errors work to achieve the designed effect to amuse listeners.

Intentional speech errors have long been used in Chinese literary works. One can find numerous examples of the intended use of puns, Spoonerisms, and omission or addition of words, syllables or phonemes in order to change the semantics of an utterance for entertaining or artistic effect. To achieve such an effect, the speaker must understand how the intended error is naturally embedded into the normal utterance and the regularities listeners listen for in comprehending it, so that the speaker can manipulate the listener. The following intentional errors from my data and from Shao (1993) are similar to the patterns in naturally occurring errors (e.g., *perseveration*, *exchange*, or *substitution*), and show how intended errors are formed for such purposes

- (16) *ta xiang ge liumang* — *mangliu* (syllable exchange)
 ‘He is like a rascal — a wanderer’
- (17) *ni tai sha le* — *ni tai xiaosa le* (syllable omission)
 ‘You are very stupid — very elegant’
- (18) *cai mogu de xiao guniang bei zhe yige da luokuang*
 ‘Picking mushroom, the little girl is carrying a big basket’
 →
 *bei zhe yige da guniang* (perseveration)
 ‘..... is carrying a big girl’
- (19) A: *ni dou xihuan shenme xiangmu?*
 ‘What sports do you like?’
 B: ... *juzhong, shejian, tiaosan, tiaogao, tiaoyuan, tiaohu* ...
 ‘... weight lifting, archery, parachute jumping, high jumping,
 long jumping, river-jumping...’ (Shao 1993)

The syllable exchange in (16) has entirely changed the meaning of the target word: *mangliu* 盲流 is nothing more than an ‘aimless wanderer’, but *liumang* 流氓 refers to a criminal-like ‘rascal/hoodlum’ in Chinese socio-cultural contents. Example (17) appears to involve an omission of the syllable /xiao-/ from the word *xiaosa* 潇洒 ‘elegant/smart’, resulting in the single-syllable utterance *sha* 傻 ‘foolish/stupid’.² Example (18) is taken from the first two lines of a popular Chinese folk song, and the speaker is using perseveration to change the pretty picture described in the song (i.e., a little girl is carrying a *big basket* to pick mushrooms in the woods) into a funny one (i.e., a little girl is carrying a *big girl* ...). Such unusual speech patterns tend to change what is expected by the listener into the unexpected, inducing amusement and laughter. In order to bring about the effect, the speaker sometimes may set a “trap” for the listener by providing a systematic set of

² In intended errors like (17), a speaker may sometimes change a feature (e.g., [+retroflexed] → [-retroflexed]) of a phoneme in order to get a word that has a similar sound but an opposite meaning.

acceptable items before releasing the intended error, usually an item that is outside the set. In (19), Speaker B seems to be determined to impress Speaker A by listing as many sports items as possible, priming the listener with the *tiao-X* ‘X-jumping’ pattern, but ends up making an “error” that is exactly opposite to the prime semantically, since the word *tiaohe* 跳河 ‘jump into a river’ in Chinese usually refers to committing suicide by drowning, which is obviously not a sports event.

Chinese *xiangsheng* ‘cross-talk’ is a traditional performance which takes the form of a dialogue between two performers. Intentional speech errors are commonly found in such performances to elicit laughter from the audience. One of the methods commonly used by these performers is for Speaker A to set a “trap” for Speaker B by priming B with a string of semantically similar words or phrases. Speaker B accepts the pattern, which is then suddenly turned in a different direction. In this “misleading” dialogue, Speaker B appears to be following the pattern, but is unable to cope with the unexpected irregularity, resulting in the error that achieves the humorous effect. The performers seem to know the linguistic priming effect well and utilize such skill to “elicit” slips, just as psycholinguists have done to elicit speech errors in lab experiments. The following examples from Shao (1993) illustrate the point.

- (20) A: *zheme shuo ni shi guo chuan?* ‘So, you have rowed a boat?’
 B: *shi guo* ‘yes’
 A: *ni ye yao guo lu?* ‘you have also steered a sweep?’
 B: *yao guo* ‘yes’
 A: *ni ye chu guo hai?* ‘you have also sailed in the sea?’
 B: *chu guo* ‘yes’
 A: *ni ye fan guo chuan?* ‘you have also overturned a boat?’
 B: *fan guo — mei fan guo!* ‘yes — no, never!’

- (21) A: *lao taitai lingzhe xiao sunzi* — ‘Grandma took her grandson —’
 B: *qu kan deng le* ‘to watch the lanterns.’
 A: *xiao sunzi ling zhe lao taitai* — ‘Grandson took his grandma —’
 B: *qu kan deng le* ‘to watch the lanterns.’
 A: *daren bao zhe haizi* — ‘parents carry their babies —’
 B: *qu kan deng le* ‘to watch the lanterns.’
 A: *haizi bao zhe daren* — ‘Babies carry their parents —’
 B: *qu kan — man, xiaohai neng* ‘to watch the — wait a minute, how
bao daren ma? can babies carry their parents?’

In (20), Speaker A first asked a number of questions that B could most possibly answer with a “yes”. To explain this in a structural way, A primed B with the interrogative sentence structure of *ni X guo Y(?)* ‘Have you X-ed a Y?’ (where X is a verb with the perfective aspect marker *guo* 过, and Y is a noun representing an object affected by the action of the verb X). When Speaker B got into the pattern by simply answering *X-guo* ‘(Yes,) I have X-ed (a Y)’ to all of Speaker A’s questions. Speaker A asked an off-the-pattern question that is most likely to be answered with a “no” (since not everyone has the experience of *fan guo chuan* ‘to have overturned a boat’, since Chinese culture considers it very bad luck). Such an unexpected pattern change caused Speaker B to say “yes” instead of “no” in the answer, since he is deeply primed by the first pattern. Similarly, Speaker A in (21) uttered four incomplete sentences for speaker B to finish up. The subject (*lao taitai* 老太太 ‘grandma’) and the object (*xiao sunzi* 小孙子 ‘grandson’) in the first two sentences switched position around the verb *lingzhe* 领着 ‘to lead, to show the way’ to form the second sentence while the semantic appropriateness remained unchanged (note that it is semantically sound for either a grandma to take her grandson somewhere, or for the grandson to take his grandma somewhere, even when the age and physical condition factors are not indicated). Therefore, Speaker B of (21) was primed with the pattern of such a sentence structure: the subject and the object of Speaker A’s sentence can be switched to form another sentence that follows without violating the

semantic well-formedness in the sentence. However, this sentence structure pattern is decided by the semantic features of individual words in the sentence. Once the semantic features of a word are changed, the well-formedness of the sentence may also change. The third sentence is exactly the same in structure as the first sentence, but the semantic features of the words in this sentence are different from those in the first sentence (it is semantically acceptable for parents to carry their babies in arms, while babies are not expected to carry their parents). This subtle change in semantic features set the trap for Speaker B, who failed to come up with the right response when prompted with the sentence *haizi baozhe daren*– ‘what did babies carry their parents to see?’.

Intended speech errors are designed and produced to amuse the audience. Although they are not real errors in the sense that they are produced as intended, a careful study on these errors shows that errors may be primed phonologically and semantically. Speech errors in an entertaining performance such as Chinese cross-talk are very similar to experimentally elicited errors in that they all involve a carefully set speech environment in which the speaker is conditioned in different ways. It is evident that the naturally occurring phenomenon of speech errors can be turned into laughter, the best medicine, following the same processing patterns as normal errors do. But speakers of intended errors must also follow linguistic rules to achieve the desired effect of their intentional slips. Therefore, a good understanding of the language internal rules and their social implications, as well as language processing mechanisms in general, is essential for creating ideal speech effects.

5.5 Summary

Speech errors have been mainly discussed along the lines of linguistic and psychological theories, but the analysis of the socio-cultural aspects of speech errors and their practical implications have been little addressed in the literature. Speech errors occur in the course of verbal communication, and such communication is inevitably conducted within a given socio-cultural environment. Studying the socio-cultural factors that cause speech errors in a given language provides insight into the relationship between a speaker and his or her socio-cultural background. If psycholinguistic research is limited only to purely linguistic and psychological activities without considering the socio-cultural context of a given language, many types of errors that naturally occur in normal speech cannot be accounted for, or are simply neglected. The socio-cultural environments of different languages can determine how a speaker's lexical storage is structured and the probabilities of error occurrence in normal speech. Errors of certain type may be very common in one language, but are absolutely impossible in another, simply because of socio-cultural differences.

Like non-linguistic errors, verbal errors can be the result of habitual cognitive activities in lexical processing and articulation that are influenced by certain socio-cultural norms. Speech errors may bring serious social consequences that involve some politically sensitive issues in special settings. Linguistic analyses of such slips are important in that the speech context and linguistic regularities may help explain the cause of the slips, and therefore prevent social consequences that can be caused by such slips.

Intended errors may also have an entertaining effect on occasions such as performances. These intentional errors, when analyzed psycholinguistically, show that phonological and semantic priming forms the basis of jokes with slips of the tongue. Jokes with planned “speech errors” are common in Chinese cross-talk performances, but they were rarely discussed in the context of psycholinguistic theories. Western psycholinguists (e.g., Reason 1982, 1992) have found in their experiments that the priming effect on speakers occurs under different priming conditions. Chinese performers have long been using such effect to manipulate humorous “errors” for entertaining their audience. Although both practices suggest that speakers (as well as listeners) tend to be influenced by linguistic priming, the discrepancy in analytical approach between Western and Chinese psycholinguistic studies calls for a unified research model to account for similar speech phenomena in Chinese and other languages.

Chapter 6

Speech Production Models Revisited

6.1 Introduction

Speech errors of various types are not seen as linguistically or communicatively “valuable” in themselves, since they are, after all, the defective product of the language process resulting from a mismatch between the speaker’s intention and the performance output, resulting in the violation of linguistic, pragmatic, and sociocultural appropriateness. Most people aim at ideal speech and communicative fluency. They try to avoid errors in their speech, although many linguists emphasize that error-free speech should not be equated with “normal speech” (e.g., Boomer & Laver 1968). However, speech errors provide information about speech performance which non-deviant speech obscures. On the one hand, speech errors tell us that our speech production system, whether a linguistic mechanism or a psychological motor-control device, does not always work perfectly to produce ideal speech. Note that non-perfect speech performance does not equal abnormal speech performance. In fluent speech, if an average normal speaker talks for an hour at the rate of 2.5 words per second, he or she is estimated to produce between 2 and 20 errors of lexical selection, while retrieving the appropriate items from among tens of thousands of words in the mental lexicon for each utterance (see Bock and Levelt 1994). These errors do not affect communication flow, and some

may not even notice that they ever occur due to biases of different kinds. Non-perfect speech can be absolutely normal. On the other hand, these errors, rare as they are, provide insight about how the speech production mechanism is structured inside the speaker, whether it has different processing levels, and how these levels interact to produce the final output in normal speech. Speech errors raise questions about established theories of language. For example, do we speak through a set of transformational rules in order to convert the underlying sentence structures of our speech targets into appropriate surface forms? Can these transformational rules account for all errors found cross-linguistically? Do we generate several speech plans and execute them simultaneously or change from one to another while speaking? Is the slip of the tongue phenomenon mainly caused by a loss of voluntary control and other psychological factors from within the speaker, or by social-cultural factors that are beyond the speaker's control? We tend to look for answers to these questions not through the study of standard speech, but from data provided by spontaneous errors that naturally occur in normal speech.¹ Speech errors are therefore crucial for understanding the speech production process. Although many studies are simply analyses of speech errors, such studies provide the basis for an account of normal production, and point to relatively immutable components of the production process (see Bock & Levelt 1994).

In previous chapters, we have shown various types of speech errors in Chinese and their English counterparts, and briefly mentioned a variety of speech production models to account for the occurrence of these errors (e.g., Fromkin 1971, Fay 1980, Garrett 1980a, Stemberger 1985, and Levelt 1989). These individual models differ from each other in some details, but their general features suggest a

¹ Some scholars (e.g., Meyer 1992) suggest that future research should directly investigate the normal process of language, since comprehensive and detailed models of language production (e.g.,

common schema of the speech production process, with several levels working either simultaneously or through serial stages that are closely related, but relatively independent in operation. Some hypotheses, however, seem to account better for the speech error data we have discussed above, while others need further modification. Most of these speech production models are largely based on English speech errors. Chinese error data therefore may serve as a testing ground to see whether such models handle speech errors in languages other than English. This chapter revisits some of the well known speech production models by evaluating them against the error data in Chinese, commenting on whether it is most appropriate to adopt a purely linguistic, a purely psychological, or a socio-cultural psycholinguistic method in the study of speech production. An ideal speech production model should account for all questions involved in speech processing, including errors from linguistic, psychological, socio-cultural aspects. The errors analysis in the present study favors a unified speech production model, which roughly follows Garrett's (1980a, 1988) functional and positional approach and Levelt's (1989) conceptualizer-formulator-articulator language production schema. This model should also take into consideration such theories as interactive activation and speech plan competition (Stemberger 1985, Baars 1980a) in order to fully account for the speech production mechanisms.

6.2 Speech errors and language production models

Linguists and psychologists have been arguing about whether speech errors are mostly caused by linguistic or by psychological factors. As mentioned in Chapter 2, the difference between the linguistic school and psycho-logical school can be

that of phonological encoding) cannot be derived solely on the basis of error analyses.

dated back to about a century ago. Although the past few decades have seen combined efforts of both linguists and psychologists, differences still remain in their views of language production. Language production is a form of cognitive behavior that involves psychological activities. Trying to understand and explain mental structures and processes is the task of psychologists, while trying to understand and explain the structure of language is the duty of linguists. Since speech production is an activity that involves the mental structure where different linguistic units are processed according to specific language structures, the study of such an activity is the focus of attention of both psychologists and linguists. It is therefore important to have a combined model that can account for speech production from both the linguistic and psychological points of view. Over-emphasizing one aspect and neglecting the other will only give an incomplete picture of the speech production process.

6.2.1 A psychological approach

As briefly mentioned in Chapter 2, a classical psychological view of speech production is the Freudian hypothesis. According to the Freudian slip hypothesis, people involuntarily allow private thoughts to slip out in unguarded moments, and such slips arise from “mutually opposing action of two different intentions” (Freud 1974, cited in Ellis 1980: 123), as illustrated in Freud’s examples.² Such a hypothesis seems capable of explaining some speech errors in my Chinese data to support such a

² Many Freudian slips are sex-orientated (e.g., see Motley 1985), suggesting the opposing actions between not willing to talk about sexuality openly and making sex-related errors in speech. One such Freudian slip cited in Ellis (1980: 124) is a typical example: “In the case of the female genitals, in spite of many *Versuchungen* [‘temptations’] — I beg your pardon, *Versuche* [‘experiments’]...” (a professor’s remark).

claim that hidden meanings can be read into verbal slips. Consider the following examples.

- | | |
|---|---|
| <p>(1) bú yào nǐ zǎo zǒu
不要你早走
'(I) don't want you to leave early'</p> | <p>→ bú yào nǐ wǎn zǒu
不要你晚走
'(I) don't want you to leave late'</p> |
| <p>(2) qǐng bú yào xiàohuà wǒ zhīshi qiǎnbó
请不要笑话我知识浅薄
'Please don't laugh at my limited
knowledge'</p> | <p>→ zhīshi yuānbó
..... 知识渊博
'..... profound knowledge'</p> |

Example (1) shows a semantic relationship between the error and the target (*wan* 'late' vs. *zao* 'early'), while (2) shows both semantic and phonological relatedness between the error and the target (*qianbo* 'shallow' vs. *yuānbó* 'profound'). If (1) is accounted for by the Freudian slip hypothesis, the speaker can be assumed to have a hidden desire to have the addressee leave *early* rather than *late*. Note that the speaker of (1) was addressing to her father's guest who was wondering if he had stayed for too long. It is considered polite to always ask the guest to stay longer even though you want him to leave soon. The error in (1) might be taken as a signal to "get out immediately" (which is, in fact, not what the speaker intended to say). Similarly, the speaker of (2) can be seen as intending to boast about her "profound knowledge" with the phrase *zhishi yuānbó* 'profound knowledge' while trying to appear modest by choosing the modest word *qianbo* that means "limited". However, such a hypothesis is barely able to describe the psychological reality, because the circumstances in which these errors were collected clearly suggest that it is arbitrary to simply state that the speakers who made the above errors had hidden intentions opposite to the meaning of the target sentences.

Induced errors in experiments have shown that semantic priming and situational priming can change the speaker's psychological state, hence increasing the rate of error occurrence (see Baars 1980b, Baars *et al.* 1992, Motley 1980; 1985). This partially supports the Freudian slip hypothesis, but only in a weak sense. For example, several exposures to words such as *salary scale* before the target will increase the rate of slips such as *rage weight* → *wage rate*; the presence of a sexually attractive experimenter can also increase the rate of sex-related slips such as *lice negs* → *nice legs*. To my knowledge, very few (if any) experiments have been conducted to elicit Freudian slips in Chinese, but error researchers in Chinese (e.g., Zhang 1990) have noticed that certain non-linguistic factors can influence speech production.

Zhang (1990) reports that the environmental stimulus that a speaker visually perceives or an event a speaker is physically involved in can influence the speech production process. A Chinese speaker intending to say *zanmen xiaci zai lai guang* 咱们下次再来逛 'Let's come to stroll around next time' actually said: *zanmen xiaci zai lai bang* 咱们下次再来棒, which is incomprehensible in the context. As Zhang explains, the speaker was uttering the sentence while noting a big Chinese sign with "棒" (/bang/)³ on the roadside. Such "contextual contamination" (see Butterworth 1980a) is also found in my error collection. For example, *qie niurou* 切牛肉 'cut the beef' became *qie zhima* 切芝麻 'cut the sesame' when the speaker was spreading some sesame on cut beef; *feng hao da* 风好大 'it's too windy' became *che hao da* 车好大 'it's too bikey' when the speaker heard a bike falling to the ground in the big wind. Thus, Chinese errors also offer some support for the idea that a visual or

³ Zhang (1990) does not provide a detailed context for the meaning of the sign. Literally, the Chinese character 棒 can mean either 'stick' or 'excellent'.

auditory stimulus can affect the speaker's psychological state, in turn influencing the speech production process.

However, the Freudian slip hypothesis has been very unattractive because of its claim that all slips have hidden meanings, at the same time failing to explain the hidden motives or the anxiety behind errors that have been categorized as phonological or syntactic errors. Slips like *guifanhua* 规范化 'standardization' → *guihuanfa* do not evoke "hidden motives and anxieties". The same is true of a slip like *zhengshi shangxue* 正式上学 'formally started schooling' becoming **shang zhengshi xue* 上正式学 'go to a formal school' (see the discussion in Section 3.3), which has more to do with the syntactic structure change rather than a hidden intention. As Bock & Levelt (1994) point out, 'errors of speech may carry fewer clues to the mysteries of unconscious motivation than to the mundane and relatively mechanical underpinnings of speech' (976).

In sum, the Freudian slip hypothesis does not seem an appropriate model for speech production mechanism, and for this reason, has never dominated the field of error research. Few of us today would argue in favor of Freud's extreme position that all speech errors can be accounted for by his theory of the unconscious. But this does not mean that psychological factors should be altogether excluded from speech production analysis, because they do influence speech performance in certain ways, as shown in the "It's too bikey" example.

6.2.2 A linguistic approach

From a linguistic point of view, speech errors help us understand the phonological, semantic, and syntactic rules that form the structure of a language.

Some utterances involve an obvious violation of grammatical rules, such as Fay's (1980) example: *Why are you an oaf sometimes?* → **Why do you be an oaf sometimes?* As I briefly mentioned in Chapter Two, Fay proposed a transformational model to account for such errors, suggesting that a sentence is transformed from its underlying structure to its surface structure through a set of transformational rules, and that if any of these transformational rules should be misapplied, transformational errors will occur. Note that most of Fay's examples for transformational errors involve wrong tensing (e.g., 'he didn't eat' → 'he didn't ate'), misposition of inflectional morphemes (e.g., 'if he gets hold of it' → 'if he get holds of it'), and misapplication of such rules as *WH-fronting*, *subject auxiliary inversion* and *Do-support* (e.g., 'what did he say?' → 'what he said?'). However, Chinese is a language that makes virtually no use of inflectional devices. There are no tense suffixes, no case marking, no agreement marking, no WH-fronting or subject-auxiliary inversion, or Do-support in Chinese grammar. Therefore, the type of transformational errors that involve these grammatical features simply do not occur in Chinese.⁴ While it is difficult to assume a set of transformational rules through which a sentence like (3) can be transformed from its underlying structure to its surface structure, and at which step the error has occurred, it seems easy for an alternative approach (e.g., Baars' (1980a) competing plans model) to explain the cause of the error without the transformational rules.

(3) wèishénme yào zhème duō? → * wèishénme yào zhème duō gānshénme?
 为什么要这么多? 为什么要这么多干什么?
 'Why do you want this much?'

From a competition approach, the error in sentence (3) can be understood as the result of combining two competing sentence structures, as shown in (4).

⁴ From the small number of structural errors in my data, I cannot find one example that can be

- (4) wèishénme yào zhème duō? (Target 1)
 为什么要这么多?
 yào zhème duō gànshénme? (Target 2)
 要这么多干什么?
 'Why do you want this much?'
 →
 * wèishénme yào zhème duō gànshénme?
 为什么要这么多干什么?

Note that a WH-phrase in Chinese can occur either before the main verb of the sentence (as in Target 1) or in the final position of the sentence (as in Target 2). Given that no WH-movement is required in Chinese grammar, the double use of WH-phrase (*weishenme* and *ganshenme*) cannot be seen as a misapplication of WH-fronting. If the competing structures above are combined in the production of the sentence, the error is easily accounted for.

Fay's transformational approach to the analysis of errors is challenged by Stemberger (1982), Chen & Baars (1992), and others, in that it cannot account for many erroneous utterances in English, nor in Chinese. As Chen and Baars (1992) point out, the transformational hypothesis implies that errors are mistakes that do not represent the normal functioning of the production system, and it describes only how well-formed sentences are generated without explaining how and why errors occur. However, errors are no longer taken as something exceptional, but rather as reflecting the regular functioning of the system. Production models based on such belief are capable of generating normal speech as well as errors (e.g., Dell & Reich 1980). The transformational hypothesis does not describe how performance errors result from the underlying ones due to misapplication of transformational rules. If grammatical government filters underlying errors and prevents them from becoming

best accounted for by this transformational approach.

overt ones. the transformational hypothesis does not explain why underlying errors should occur at all in the first place, and in which circumstances transformational breakdowns take place.

Baars (1992b) criticizes Fay's model as "faulty syntactic transformations" (16). But my point here is that a purely structural or derivational approach does not have the flexibility needed to explain the link between planning and execution of the plans. Some errors can be better explained outside the domain of syntactic or phonological constraints described by linguists. For example, if an error like $y\dot{i}T2wangT3$ 以往 'in the past'⁵ → $*y\dot{i}T3wangT2$ is simply analyzed as the result of misapplication of sandhi rules which caused the tone error, we can hardly explain what caused the rule misapplication in the first place. Focusing our attention only on the underlying structure and surface structure of the tone sandhi will not help. But if we shift our focus from the tonal structure of the erroneous item *per se* to other items that share similar features (e.g., semantic similarity), we may find that the competing item $y\dot{i}T3qianT2$ is more likely to be the cause (see Chapter 4). Therefore, a language production model should consider not only the syntactic or phonological structure of a sentence, but also the mental structure and the psychological activities of the speaker.

6.2.3 Competing-Plans Model

Baars' (1980a) *Competing-Plans Hypothesis* explains how unintended speech may indeed reflect subconsciously intended speech plans, so that speakers may have

more than one plan competing to be ultimately uttered. Competition exists whenever two or more plans suit the same goal (Chen & Baars 1992). Multiple plans may be developed in the course of normal speech production although only one plan is ultimately executed. Sometimes, two correct plans may be executed before one is clearly favored over the other. When such a “mixed” or “blended” plan is not edited in time, an error is likely to occur. Motley (1985) used examples to illustrate how such a hypothesis can indeed explain the occurrence of speech errors. In fact, a number of Chinese errors from my data can also be accounted for within the framework of this model.

<i>competing plans</i>	<i>slips</i>
(5) <i>dǎzhàng / dǎjià</i> 打仗/打架 ‘to fight’	→ <i>dǎzhà</i>
(6) <i>shàngdàng / shòupiàn</i> 上当/受骗 ‘to be cheated’	→ <i>shàngpiàn</i> 上骗
(7) <i>tā bù shōu huànzhě / tā shì dàifu</i> 他不收患者/他是大夫 ‘He doesn’t take (new) patients/He is a doctor’	→ <i>tā bù shōu dàifu</i> 他不收大夫 ‘He doesn’t take doctors’
(8) <i>nǐ chī lí bù chī / chī bù chī lí?</i> 你吃梨不吃/吃不吃梨 ‘Do you want to eat a pear?’	→ <i>nǐ chī lí bù lí?</i> 吃梨不梨

The above examples show that two competing plans can result in an error associated with some of the features shared by each of the planned sentences. These errors combine components from the two plans in an automatic but highly rule-governed way. The combined components can be at the phonological level, the semantic level or the syntactic level. As the above Chinese examples show, creating

⁵ The sandhi tone is used here for the syllable /yi/ to show the tonal change between the error and the target in the sentence.

order competition between higher level constituents can result in movements of lower level elements. For example, competing words lead to phoneme and syllabic sequencing changes or morpheme changes. Example (5) involves the competition between two words (*dazhang* and *dajia*, both meaning 'to fight'), and the result is the combination of the second syllable initial /zh-/ in /dazhang/ and the second syllable final /-a/ in /dajia/. hence the error /dazha/. Example (6) involves competition between two words (*shangdang* and *shoupian*, both meaning 'to be cheated'), and the error is the combination of the syllable /shang/ in Word 1 and /pian/ in Word 2. Competing ideas or actions lead to changes of semantically related lexical items, such as the change from *huanzhe* 'patient' to *daifu* 'doctor' in (7). The competing sentences in (8) lead to the change of sentence patterns (i.e., V N bu V / V bu V N → V N bu N).⁶ Conflicts of order between higher level units seem to cause a switch of subordinate action. In other words, a conflict between sentences results in the change of a word; a conflict between words results in phoneme/syllable error, and so forth. This sequential error occurrence clearly involves a top-down interaction between different levels of control.

The competing plans model assumes that simultaneously occurring speech plans at different levels may overload the speaker's limited speech processing space, and information can not be edited in time. Chen & Baars (1992) argue that simultaneous tasks have to share the limited resources; when the task exceeds the available resources, the speech production process is jeopardized. One way to solve the over-loading problem is to automatize some of the speech tasks, or to increase the processing capacity by allowing more time for the production of a sentence. Evidence shows that talking at a slow speed is less likely to lead to errors than

⁶ This is an **Affirmative-not-Affirmative** sentence structure in Chinese grammar where V=Verb, N=Noun, *bu* is the negation marker (also see Section 3.3.2).

talking at a fast speed. The increased processing capacity allows the speaker enough time to edit competing plans before executing the utterance.

Baars (1992a) also notes the difference between a spontaneous slip of the tongue and the voluntary repetition of a slip. Speech errors are essentially a mismatch between intention and performance, but a speaker may voluntarily repeat his own slips. Although the slip and its voluntary imitation are behaviorally identical, they are psychologically different. This difference has something to do with the question of voluntary control (see Baars 1992b). The goal of speech processing, set to realize the speech intention, may have a number of sub-goals, and the intention itself is also subject to change through voluntary control. Baars illustrates how the initial goal of an intended act may be replaced by some other acts. For example, "I went up to my bedroom to change into something more comfortable for the evening, and the next thing I knew, I was getting into my pajama trousers" (Reason 1982, see also Baars 1992a). The footnote here is that the original intention was to change the formal dress to something comfortable and casual at home; but the state of being in his own bedroom triggered the change of his original plan, resulting in the action of putting on his pajama trousers for sleep, which was not what had been planned. The point is that one's intention can be changed during the execution of the plan.

For the same reason, a speech intention may result in some non-intended speech act. This shift from one plan to another is influenced by linguistic constraints at a different level. Take an example from Baars (1992c), a speaker may intend to say "I really made a goof," and decides to add an emphatic adjective *bad* after beginning to say the word *goof*. Thus the initial phoneme /g/ of *goof* may already be activated when the initial phoneme /b/ of *bad* is inserted. The highest activations are then /g/ and /b/. However, phoneme sequencing constraints rule out a combination

like /gb/, and syntactic constraints do not allow /goof bad/, leaving the speaker with the only possible combination in process, which is the error **gad boof*. Chinese slips such as (5) above (*dazhang/dajia* ‘to fight’ → **dazha*) seem also accounted for by such an analysis. When both *dazhang* and *dajia* are available for selection, the speaker may intend to switch from *dazhang* to a more colloquial *dajia*. When the syllable /zhang/ is being prepared to be uttered, the syllable /jia/ is activated and inserted. Since the planned phrase has only two syllable slots (for either /dazhang/ or /dajia/), consonant clusters are not permitted in Mandarin and the retroflex initial and the palatal glide cannot co-occur, the combination of the syllable initial /zh-/ in *dazhang* and the final /-a/ of the competing word *dajia* is a natural solution, hence the error *dazha*. As pointed out in Baars (1992a), a common source of internal interference is the presence of two goals, each actively working to gain access to the conscious/limited-capacity system, in an attempt to control the forthcoming action.

Baars’s competing-plans model explains a number of errors that involve two or more equally accessible and equally correct speech components. His model examines speech errors with respect to the speaker’s mental work space to handle multiple tasks in speech performance, and the speaker’s potential to voluntarily control speech intentions. However, the model does not explain clearly how each of the plans is carried out and how the competition starts at different levels. Furthermore, the prediction that speakers may voluntarily control and change their speech intentions seems to over emphasize the speaker’s volition and psychological activity in the course of the speech production process at the expense of the obvious linguistic regularities shown in the errors. Sometimes the intended utterance and the error do not have obvious phonological, semantic, or syntactic features that are shared by two competing plans. For example, in Chinese slips based on orthography such as *xujiu* 酗酒 ‘excessive drinking’ → **xiongyiu* 凶酒 and *pozhan* 破绽 ‘flaw’ →

**poding* 破定, speakers do not seem to rely on two ‘competing speech plans’. The error is merely a misexecution of one target plan rather than shifting from one plan to another. If the target speech plan did not generate the message structure that requires the retrieval of the lexical item *xujiu* 酗酒 ‘excessive drinking’, the erroneous *xiong* 凶 could not be visualized and uttered (see discussion in Chapter 4). Similarly, *poding* 破定 cannot be regarded as an individual speech plan that is competing with the target *pozhan* 破绽 ‘flaw’, because it is only the result of misexecution of the target plan.

Although Baars’ model does not endorse Freud’s claim that all speech errors represent hidden motives, Baars sees voluntary control over speech process as being as important to speakers as linguistic rule systems. In Baars’ own words, “a slip represents a loss of voluntary control rather than a rule violation” (1992a: 6). However, loss of voluntary control may not necessarily result in a slip if no linguistic rules are violated. For example, the Chinese third person singular pronouns in any case and gender (the equivalent of English *he*, *him*, *she*, *her*, and *it*) are all represented by the syllable /ta/ (他、她、它). If the loss of control during speech production results in the substitution between any of these items, the result is still grammatically well-formed since no linguistic rule is violated. Word exchange and syllable exchange in a non-intended utterance may not always be a grammatical error. For example, if an intended English sentence like *Tom and Mary are friends* is uttered as *Mary and Tom are friends* because of “a loss of voluntary control”, it can hardly be considered as an error, since no grammatical rule is violated, and it conveys the same idea as the speaker has intended (see **Appendix: Unintended non-errors**). Therefore, over-emphasizing voluntary control and neglecting linguistic rules is not an appropriate method for analyzing speech errors. Researchers in different linguistic subdomains (e.g., phonology, syntax, semantics) would focus their

attention to particular problems within their area. We cannot expect a syntactic model to account for phonological or lexical errors. Similarly, psychologists and linguists may share different views over the issue of language production. This is why psycholinguistics (or the psychology of language) should combine various theories to look into the phenomenon of speech errors.

6.2.4 Two-Stage Processing Model

While psychological analyses of language production are gaining attention among error researchers, it is generally accepted that “natural language can be characterized by a grammar whose rules have been compartmentalized depending on the types of units and structures that they operate on” (Dell & Reich 1981). Phonology, syntax, and semantics are among such compartments or components that most linguists believe to form language structure. The application of grammatical rules is believed to be conditioned by the information within each of the compartments, and this leads linguists to assume that the rules in such compartments should be applied at different stages of the language production process. One of the most influential language production models that describe language processing stages in this way is that proposed by Garrett (1975, 1980a, 1980b, 1988).

Garrett (1975) first proposed that the sentence production process contains two independent and serially ordered stages, a **functional stage** and a **positional stage** (see Chapter 2). In the functional stage, an underlying grammatical representation of the sentence to be spoken is constructed. This representation consists of words (represented abstractly, but not phonologically), together with a description of the underlying grammatical relations among the words. This stage

consists of two processes: lexical selection (retrieval of a word with its meaning and its grammatical representation) and lexical insertion (placing of a selected word in the developing functional representation). Following the functional stage comes the positional stage, where the phonologically specified morphemes are arranged in the right order. These two stages are relatively independent, with each stage having access to its own type of information, but blind to the information for the other stage. That is to say, the functional stage is assumed to have access to the grammatical function of words, but is blind to the phonological structure. On the other hand, the positional stage has access to the phonological specification of the morphemes in the sentence and their ordering, but does not have access to the grammatical function of the strings of phonemes (see Garrett 1975; Dell and Reich, 1981).

Garrett's two-stage model is based on analyses of speech errors that involve the movement (e.g., anticipation, perseveration, exchange, switch, substitution) of sounds and those that involve the movement of words, as well as the span over which the involved elements move. Focusing on speech errors of the exchange type, Garrett (1980) notes that sound exchanges are typically phrase-internal and involve words of differing grammatical categories; word exchanges occur across phrases and involve words of the same grammatical category.

Garrett's two stage model largely accounts for the regularities in Chinese exchange errors.

- | | | | |
|------|---|---|---|
| (9) | bǎ jiǎo fàng zài zhuōzi shàng
把脚放在桌子上
'put the foot on the table' | → | bǎ zhuōzi fàng zài jiǎo shàng
把桌子放在脚上
'put the table on the foot' |
| (10) | chōu yān, hē chá 抽烟, 喝茶
'smoke cigarette and drink tea' | → | hē yān, chōu chá 喝烟, 抽茶
'drink cigarette and smoke tea' |

- (11) yíqiè tōngchàng 一切通畅 → yíqiè chōngtàng
 'all is unobstructed'
- (12) xiǎojī bú huì fēi 小鸡不会飞 → xiǎojī bú fēi huì fēi
 'little chicks cannot fly'

The examples above show that word exchange errors involve items of the same grammatical class, for example, noun for noun (9), or verb for verb (10). The segments involved are not adjacent to each other, because Chinese grammatical structures, like those in English, show that a verb have non-verb arguments as its subject or object, making it less likely for two words of the same grammatical function to be adjacent to each other in a typical SVO sentence. When words are exchanged, the sentence often retains the grammatical structure of the target sentence, although the semantics of the sentence can be changed due to the exchange of the words, as shown in (9) and (10). This is why the erroneous sentences after the word exchange can still have a meaningful and structurally well-formed interpretation. On the other hand, sound exchanges tend to involve elements in adjacent syllables within a single word (e.g., *tongchang* 'unobstructed' → *chongtang* in (11)), or the exchange may occur between adjacent syllables across word boundary regardless of the grammatical category of the word they belong to (e.g., *bu hui fei* 'cannot fly' → *bu fei hui* in (12)).

From analyses on errors in both normal speech and aphasic performances, Garrett (1992) reiterates the idea that the processes that recover individual lexical items under conceptual control have a detailed substructure that distinguishes the semantic and syntactic aspects of lexical description from the abstract phonological

description. Bock and Levelt (1994) give a simplified account of the language production process based on Garrett's assumption that speech is processed at different levels. "The processes of language production can be divided into those that create the skeleton of an utterance and those that flesh the skeleton out" (945). The creation of such a skeleton occurs at the functional level while the fleshing out of the skeleton takes place at the positional level. The syntactic skeleton of a sentence would be the grammatical structure with functional slots for each lexical item, and processing at this stage occurs prior to the phonological processing of individual words. As can be seen in (13), the grammatical structure of the sentence was violated with the word order changed. The speaker has put the lexical slots in the wrong order with the subject noun *fei* and the predicate verb *qi* exchanging positions across the adverb *dou*.

(13)	fèi	dōu	qìzhà	le	肺都气炸了
	lung	even	explode with rage		
	(n.)	(adv.)	(compound v.)	(Asp.)	
	'(my) lungs exploded with anger'				
			→		
	*qì	dōu	fèizhà	le	气都肺炸了

The phonological processing of each of the lexical items has been carried out, so that the lexical items each occur in their correct phonetic shape. Such examples illustrate that grammatical functions in a sentence and the phonological realization of lexical items are processed at different stages.

The different processing stages in speech production can also be seen in logophonographic errors which involve the written structure of a lexical item, and

⁷ The Romanized spelling of the Chinese sound /hui/ is better represented as /huei/ here since it is closer to the description in IPA (see Table 1.2 in Chapter 1), and it also more clearly shows that

bilingual errors which involve the interference between two different languages, as discussed in Chapter 4. A logo-phonographic error involves deviation from a morpheme (or a character) intended to occur in a serially ordered position of the sentence skeleton. Due to factors such as mental visualization or past experience, this position is filled by a morpheme (or a character) that is logographically related to the target morpheme. For example, in an error like *ba ta jiu chulai* 把它揪出来 ‘pull it out’ → *ba ta qiu* (秋) *chulai*, the target *jiu* 揪 is replaced by the error *qiu* 秋, which is a phonetic radical in the target character. If the speech production process has not created an underlying grammatical structure (at the functional level) that provides a functional slot for the target word in the first place, there can be no way to explain why the logographically related word occurs at that position in the utterance (which is obviously a process at the positional level). Note that the target word *jiu* 揪 ‘to pull out’ is the main verb in the sentence, but the error *qiu* 秋 represents a noun (meaning ‘autumn’) that does not fit in the grammatical structure of the target sentence. If the functional stage does not put the verb *jiu* 揪 in the underlying structure, and if *qiu* 秋 is not logo-phonographically related to *jiu* 揪 and hence activated, it is hard to understand why *qiu* 秋 should occur in that particular position in the erroneous sentence. This seems to suggest that a logo-phonographic error occurs at a level where the underlying structure has already been created, and where the task of filling out the positions is executed.

Similarly, in a bilingual error such as *wo kaiche song ni qu xuexiao* ‘I will drive a car to take you to school’ → **wo kaini qu xuexiao* ‘I will drive you (instead of a car) to school’, the error of processing occurs at the stage of lexical selection, where the Chinese lexical item *kaiche* ‘to drive’ and its English counterpart are activated with their grammatical features. The verb *drive* in the English sentence ‘I

/h/ and /u/ in this case form a single constituent (see discussion in Section 4.5).

will drive you to school” can mean both “to drive the person” and “to drive a car” while the verb *kai* in Chinese subcategorizes only for a vehicle (e.g., *che* ‘car’), forming the compound verb “to drive (a vehicle)”. The difference between lexical items and their grammatical properties in the two languages caused the speaker to conduct grammatical encoding in a different and competing language system at the functional level, and this mistaken operation in the speech production process results in the error.

6.2.5 Interactive activation model

The two-stage sentence production model which proposes serially ordered stages has been challenged by connectionist models of the speech production process. While in basic agreement with Garrett’s (1975) suggestion that language production goes through different levels, Stemberger’s (1982) *interactive activation model* assumes that the levels of language production are not processed in a discrete serial fashion. Rather, the word and syntactic structures are processed simultaneously and the different processing levels interact. The syntactic structures that are activated select words that have certain characteristics (e.g., being an agent of an action, hence a noun or a pronoun). By the same token, words select particular types of syntactic structures. In this model, alternative surface structures for a sentence can be generated directly from the syntactic component. An unintended surface syntactic structure of the sentence can be activated and retrieved, just as words can be incorrectly accessed. To take an example from Stemberger’s (1982) data, the English word ‘easy’ may activate a related word ‘easily’, which may in turn activate a different sentence structure: ‘It seems to be easily fixed/It seems to be easy to fix’ → ‘*It seems to be easily to fix’. Following this assumption, in a Chinese error like *weishenme yao zheme duo* ‘Why do you want this much’ → **weishenme yao zheme*

duo ganshenme, the WH-phrase *weishenme* ‘why’ (which occurs sentence-initially or before the predicate) may activate a related WH-phrase *ganshenme* ‘for what’ (which occurs at the end of an interrogative sentence). The two activated phrases may in turn activate different interrogative sentence structures, hence the error: *weishenme yao zheme duo* ‘Why do you want so much?’ / *yao zheme duo ganshenme* ‘Why do you want so much?’ → **weishenme yao zheme duo ganshenme*?

Stemberger’s (1982) activational model predicts that sentences and words are processed at the same time. This model raises doubts among researchers (e.g., Chen & Baars 1992) who wonder how there can be a separate syntactic store, like the lexicon, that collects a set of surface structures that are readily usable for making sentences. Chen and Baars (1992) argue that although a finite vocabulary is an acceptable assumption, a finite set of surface structures is not. It is true that such arguments are theory-dependent. While the idea of a finite set of lexical items is more acceptable (since we call the lexicon the mental dictionary), the idea of a finite set of syntactic structures is behind such theories as Generalized Phrase Structure Grammar (GPSG) (e.g., see Gazdar *et al* 1985). But the question is, while activated lexical items can be partially or entirely substituted in an erroneous sentence, the simultaneously activated sentence structures seem to only “blend” but not one substituting another. This is because if a structure is entirely replaced by another structure, the result may not necessarily be a structural error. Even if it is not the target structure, we would have no way of knowing it as long as it is syntactically well-formed and semantically appropriate in the discourse. Therefore, lexical items and syntactic structures do not behave in similar patterns in terms of their activation in error analyses. Also, while any syntactic structure can activate the planned lexical items to “flesh out the skeleton”, it is unlikely that any lexical item will activate the required syntactic structures. If the adjective “easy” is assumed to activate a

semantically related adverb “easily” which, in turn, activates a different sentence structure. It is hard to imagine what kind of structural change will take place if the lexical activation is between, say, two nouns (e.g., “black” vs. “white”) or two adjectives (e.g., “big” vs. “small”). Furthermore, if different sentence structures can be activated to convey the same information, each activating the lexical items needed (e.g., “It is easy to fix” vs. “It is easily fixed”), an error like “*It is easily to fix” can still be understood as the result of blending between two structures at the structuring level, rather than generating one structure first, which activates lexical items, which in turn activates the second structure to compete with the first.

Secondly, while the activation of a certain word may seem to influence the formation of a sentence structure, this does not mean that the processing is not in a serial order. In Garrett’s model, the functional level deals with the retrieval of lexical items and their grammatical relations and with placing the items in the developing functional slots. As Bock & Levelt (1994) explains, the primary subcomponents of functional processing are lexical selection (which involves the identification of lexical concepts suitable for conveying the speaker’s meaning) and functional assignment (which involves the assignment of grammatical roles and syntactic functions). Take the example of *zhenshi shangxue* ‘formally starts schooling’ → *shang zhengshi xue* 上正式学 ‘*goes to a formal school’ discussed earlier. The lexical item *zhengshi* ‘formal, formally’ has been selected to convey the meaning but is assigned wrong grammatical function (from the target function of an adverb to the function of an adjective). The item with the wrongly assigned grammatical function then proceeds (together with other items) to the positional processing (which involves the creation of an ordered set of word slots and morphological slots where it is placed after the verb (*shang* ‘go to’) and before the “partial noun” *xue* ‘school’, hence the error (see discussion in Section 3.3.2). The English example (‘It seems to

be easy to fix' → '*It seems to be easily to fix') can be accounted for in the same way. When words are retrieved, they influence the still developing grammatical structures, but at this stage, these abstract lexical items have to be adjusted in accordance with both syntactic and semantic rules before being serially positioned according to their grammatical functions. Once the lexical items are selected and the grammatical adjustments are done at the functional level, they will have to be phonologically encoded in a serial order at the positional level in order to be uttered. Note further that the grammatical adjustment at the functional level functions to build up the most suitable sentence structure, but this operation may sometimes fail to result in a desired structure due to various factors. For example, in errors like *ni zhidao bu zhidao* 'do you know or not?' → **ni zhi bu bu zhidao*, the process is caught between two possible but equally correct structures (*ni zhidao bu zhidao* vs. *ni zhi bu zhidao*). Once this less than perfect structure is created along with the retrieved lexical items, it is transferred to the next processing step to be serially ordered. In this case, the error is at the functional level, not at the positional level.

Stemberger (1985) observes that sound errors (e.g., exchange, substitution) have a tendency to create lexical items, contrary to the assumption that such errors are influenced only by positional variables. Stemberger (1985) explains this phenomenon as the interaction between phonological information and lexical access, arguing that "all types of word substitution error are facilitated by a phonological similarity between the target and the error word, (and) are facilitated if the error resembles a real word" (156). However, not all types of word substitution errors are facilitated by a phonological similarity between the target and the error, as we have already seen in the Chinese errors of the logo-phonographic and bilingual types (see Chapter 4). My error collection shows two types of sound errors: one that shows phonological similarity with the target but is semantically unrelated (e.g., *bizi* 'nose')

→ *pizi* ‘leather’), and the other that shows both phonological/morphological and semantic relatedness (e.g., *changsuo* ‘location’ → *changhe* ‘occasion’). The former type should be considered to involve influence from phonological variables at the positional level, while the latter type should be regarded as involving wrong word selection at the functional level. Although both types of sound substitution involve phonological relatedness to the target, they should not be confused in that one involves an error in the course of lexical selection (a higher stage of speech production), while the other involves an error in the course of phonological execution of the selected item (a lower stage of the production process).

Many sound errors resemble real words, not because of the interaction between the lexical selection at the functional level and the phonological retrieval at the positional level, but for two other reasons. These errors are either wrongly processed at the functional level during the lexical selection, or are wrongly processed at the positional level and happen to sound like real words. For example, in substitution errors such as *shangren* ‘businessman’ → *shengren* ‘stranger’, the syllable change from /shang/ in *shangren* to /sheng/ in *shengren* (which happens to sound the same as the word that means ‘strange’) does not indicate that the word *shengren* ‘stranger’ has been activated at the functional level along with the target word *shangren* ‘businessman’. They are semantically irrelevant to each other in the context and hence cannot be processed at the functional level where an abstract message structure is built. Given the special characteristics of Chinese syllabic structure, any initial can form a possible monosyllabic word in combination with any final, so long as it is within the Chinese phoneme inventory.⁸ For example, the vowel

⁸ Certain initial-final-tone combinations do not form legitimate syllables in Chinese phonology that represent meaningful words. However, some of the uncommon syllables, particularly those that involve glides /i/ and /u/, such as /bia/, /bua/ and /biu/ are sometimes used as onomatopoeic words though they are not listed in any initial-final combination tables.

(or final) /a/ can be combined with any of the syllable-initial consonants (or the initials) to form a meaningful one-syllable word (except with the palatal initials /j/, /q/ and /x/). This special nature makes it possible that any sound error is likely to be a real word in Chinese. Such a difference can also be seen in English errors of the blending type, where an error can either be a real word or a non word. For example, *shromkin* (from *she/Fromkin*) is a non-word while *clear* (from *close/near*) is a real word, but has no semantic (or functional) relation with “close” or “near” in the sentence (see Meyer 1992). Therefore, the tendency for an error to sound like a real word is not to be interpreted solely as activation from the positional level to the functional, or the phonological influence over lexical selection. Interactive activation may indeed exist between segments at the same level or from an upper level to a lower level (as shown in speech errors where phonologically, semantically and syntactically similar segments substitute each other), but a sound argument for activating the selection of lexical items or a syntactic structure from a certain degree of phonological similarity or even a single sound is yet to be further developed.

6.3 A Unified Speech Production Model

Speech production models may vary, each having its own emphasis. But psycholinguistic studies aim at a unified speech production model that can explain cross-linguistically how speech comes from a pre-programmed mechanism that transforms a speech intention into a syntactically, semantically, phonologically, and contextually well-formed utterance for communicative purposes. Although there is no single foolproof approach to the study of speech production, an ideal unified model should take all factors into consideration and should be able to account for all types of speech errors in natural languages. So far, the study of speech production is

still largely based on the discussion of speech errors found in just a few languages. the analyses of speech errors in my data (along with errors in other languages) favor such a unified model which involves an ordered process from an intention to articulation. This process involves various factors including the speaker's intention, socio-cultural or bilingual background, speech environment or context, as well as the speaker's psychological state, lexical access, grammatical and phonological encoding, application of linguistic rules (including the structural rules of the writing system of the language involved), and the phonetic realization of the intended speech in the final articulation. Although a speech intention is transformed into articulation in a fraction of an instant, the activities of the speech mechanism within this process cannot be executed in a random order without going through individual stages. The unified model that accounts for such a process seems to find a basic description in Levelt's (1989) overall schema for language production which contains the cognitive (or prelinguistic) *conceptualizer*, a linguistic *formulator*, and a language-dependent *articulator*. This schema separates different processing activities into different stages. Much like Garrett's functional/positional speech production model, Levelt's schema sees speech production as a serially ordered process, and at the same time accepts the notion of activation at different levels, thus treating speech production as a linguistic, psychological, socio-cultural and physical entity.

According to Levelt's schema, a speaker uses both linguistic and non-linguistic knowledge to conceptualize a speech intention which is to be transformed into a preverbal message at the mental stage where socio-cultural or bilingual background is influential. This is because different information provided to the conceptualizer can be computed into different message structures. To illustrate this process, let us take an imaginary sentence, for example, a speaker may intend to say something like *ta kaiche song ta biaomei qu sheyingshe* 他开车送他表妹去摄影社

whose English equivalent is *He is driving his cousin to a photo shop*. Linguistically, the speaker has to conceptualize what he or she has in mind and organize the information that captures the features of the speaker's intended meaning and provides the raw material for the processes of grammatical encoding. The message structure to represent such a speech intention has to be built up with such components that represent a single male human being as the agent of an action, an on-going action, a second individual who is the receiver of the action, and the destination of the whole activity described in the message. At this stage, the speaker is clear about what action (*driving*) is involved in the sentence to be uttered, who is the agent of the action (*he*), who is the receiver of the action (*his cousin*), and the purpose of the action (*to go to a photo shop*). If the same speech intention is formed in the mind of a Mandarin speaker, the information obtained by the conceptualizer may be different from that of an English speaker. For example, the concept of "to drive" has to involve not only the action of "driving", but has to involve a particular subcomponent that represents the means of transportation (e.g., *kaiche* 开车 'drive a car'). Although in English such a concept can be represented with either a single verb "drive" or a verb plus a noun that indicates locomotion, the concept in Chinese must be represented with both. Similarly, the concept of "cousin" has to be specified for gender (e.g., *biaodi* 'male cousin' vs. *biaomei* 'female cousin') and age (younger or older than the referent, e.g., *biaojie* 'elder female cousin' vs. *biaomei* 'younger female cousin'), and maternal or fraternal features which are determined by the social norms of the language community (e.g., *biaomei* vs. *tangmei*, see Chapter 5). The English word "cousin" does not carry the same conceptual values as its Chinese counterpart *biaomei* 表妹 'cousin' does, since *biaomei* 表妹 specifically means one's younger female cousin who is the daughter of one's mother's brother or sister. If the speaker is psychologically or contextually influenced by what is mentally experienced, or by what is taking place in the speech environment at the moment of

the message structure construction, the conceptualization of the speech intention may turn into something different. For example, the speaker may intend to say “He is driving his cousin to a photo shop”, and at the same time tells himself that the photo shop is next to a dental clinic. This reference of “dental clinic” can be strongly associated to the target concept of *photo shop*, and influence the conceptualization of the original speech plan, changing it into a different message structure, such as that for *He is driving his cousin to the dentist*. Similarly, if the speaker sees that the car has a flat tire which needs replacement, this “environmental influence” may make the speaker end up saying *He is driving his cousin to the auto shop*. This is the kind of error that occurs at the highest level of speech planning, and is described by Baars as the result of competing plans. That is to say, a speech intention may be influenced by the speaker’s cognitive state and the speech context. Such conditions may generate two or more speech plans at the same time, and the conceptualizer will generate the message structure for only one sentence. This is why some errors at the higher planning levels result in an utterance that is either semantically incomprehensible or syntactically ill-formed, since these errors are usually the combination of two semantically and syntactically different message structures.

The message structure, abstract at this point, is then grammatically organized in the *formulator*, where lexical items are retrieved and their grammatical relations are specified to reflect the conceptual relations in the message. The formulator has two tasks: functional processing and positional processing (Garrett 1975). The primary subcomponents of functional processing are lexical selection (the identification of lexical concepts that can best convey the speaker’s meaning) and functional assignment (that of grammatical roles or syntactic functions). Lexical

selection involves identifying the lexical concepts and *lemmas*⁹ suitable for conveying the message. For conveying the message of the *photo shop* sentence, appropriate *lemmas* include indices of a masculine pronominal (*he*), a verb (*drive*), two nouns (*cousin* and *photo shop*). While retrieving these target lexical items, some other items associated with these items in different ways are also activated. A common type of error that can occur at this stage reflecting a problem of lexical selection is semantic substitution. For example, an English speaker may wrongly select a feminine pronoun *she* instead of *he* (since *he* and *she* have similar pronominal functions and are hence easily activated together); a Chinese speaker may wrongly select *biaojie* 表姐 'a female elder cousin on the mother's side' instead of the target word *biaomei* 表妹 'a younger female cousin on the mother's side' due to influence from the complex kinship term system in Chinese.

With the target lexical items retrieved, they are then assigned their grammatical roles and syntactic functions. In the message structure that represents the grammatical relations of the example sentence, the one who does the driving (*he*) is the subject or the agent, the recipient of the action is the object (*his cousin*), the action that *he* takes to cause *his cousin* to reach the destination (i.e., *the photo shop*) is represented by the main verb *to drive*. With each item assigned its grammatical functions, they are then linked up following the grammatical rules of the given language. Errors of function assignment arise when elements are assigned to the wrong functions. A common type of such an error is word exchange. If the masculine pronoun lemma is linked to the object function and the feminine noun is linked to the subject, the resulting utterance is likely to be *His cousin is driving him to the photo*

⁹ A word as a syntactic entity is technically called a *lemma*. *Lemmas* contrast with *lexemes*, which capture the word's properties of form, such as the word's phonological shape and morphological structures (see Bock & Levelt 1994).

shop, or its Chinese equivalent *ta biaomei kaiche song ta qu sheyingshe* 他表妹开车送他去摄影社.

Because of the language-specific characteristics that differ from language to language, English and Chinese speakers may experience different lexical retrieval and function assignment tasks. For example, an English speaker has less difficulty retrieving the word *cousin* (since it covers a broad range of “cousinship”), while a Chinese speaker has to be specific about the exact type of *cousinship* to represent the meaning of the speech intention. On the other hand, a Chinese speaker has less worries about subject-verb agreement, since Chinese has a less rigid tense marking system than English. If functional processing is interfered with, wrong word selection or grammatical association is likely to occur at this stage, leading to syntactic or semantic errors such as word exchange or wrong use of tense. A bilingual speaker at this stage may apply two sets of grammatical systems, either retrieving the lexical items in both L1 and L2, or applying the grammatical system of L2 to the sentence structure in L1 (e.g., **ta kai ta biaomei qu sheyingshe* 他开他表妹去摄影社 ‘He is driving his cousin (as a means of transportation) to the photo shop’).

The output of such grammatical encoding is a surface structure with each lexical item retrieved and specified for grammatical relations. This structure then goes through positional processing that involves the creation of an ordered set of slots for lexical and inflectional morphemes which are phonologically encoded. This is the final spelling out of the phonological structure of the utterance. At this stage, the phonological encoder creates a phonetic plan on the basis of the surface structure, and incorporates procedures for generating the prosody of an utterance. Thus, the retrieved lexical items are phonologically specified to form an internal speech.

Phonological errors (e.g., anticipation, perseveration, blending) tend to occur at this stage if the phonetic slots are filled with the wrong phonetic segments for a given word.

Activation among lexical units takes place at different levels in the formulator. A target phonetic segment may activate non-target phonetic segments that possess similar phonological features. Activation of a target lexical item may be influenced by many factors. For example, lexical retrieval influenced by a second language may result in mixing the phonological properties of equivalent lexical items from two languages, resulting in bilingual errors such as *kaiche* → *zhuai*che ‘drive a car’ (where the initial /k/ of the Chinese /kai/ is influenced by the syllable onset [dr] of the English word ‘drive’, resulting in /zhuai/); *song* → *sen* ‘sent’, hence the sentence becomes **ta zhuai*che *sen* *ta* *biaomei* *qu* *sheyingshe*. Such errors in the pronunciation of bilinguals may occur more often when the phonetic properties of equivalent lexical items in two different languages share similar phonetic features, indicating that different items may have similar activation force when they are similar both in meaning and sound. They also indicate that an error at a higher speech planning level can be reflected in lower level speech performances. Mispronunciation of a lexical item can also be caused by factors such as mental visualization. For example, when retrieving the Chinese lexical item *sheyingshe* 摄影社 ‘photo shop’ and fixing the order of its phonetic elements, the speaker may use mental visualization to look for clues to the pronunciation of the word from its written form, since many Chinese characters have radicals that provide phonological information about the character (see Section 4.3). But if such a search for phonetic clues is applied to characters that do not have phonetic radicals, an error of the

mental visualization type is likely to occur, such as **nieyingshe* 摄影社 for *sheyingshe* 摄影社 'photo shop'.¹⁰

The phonetic plan is then executed in the articulator where the movements of the articulators yield overt speech. Malfunctions of the articulators may result in the omission, addition, or repetition of phonemes or syllables due to the similarity effect or speed effect. For example, a sentence with many retroflex sounds (e.g., *shishi shi ta bushi sishi* 事实是他不是四十 'It is the fact that he is not forty') will more likely turn a non-retroflexed sound into a retroflexed one (e.g., *shishi shi ta bushi shishi*). Levelt further assumes that there is a speech-comprehension system whose task is to allow the speaker to monitor his or her own production. If this system is shut off, speech errors may occur without being noticed by the speaker.

The unified speech production model as described in Levelt's schema does not exclusively talk about transformational rules, nor does it over-emphasize competing plans, or the psychological state of the speaker. Yet it contains analysis from linguistic, psychological, socio-cultural, and contextual perspectives. It takes non-linguistic factors into consideration, accepts the idea of activation between different lexical items, between phonological items, and from higher level units to lower level units, and yet still treats speech production as an ordered activity that goes through separate stages. Furthermore, it accounts for all types of speech errors discussed in English and Chinese. It therefore appears to be the most appropriate approach to the analysis of speech production and offers the most explanatory power.

¹⁰ In Chinese words such as *sheying* 摄影 'photography' or *sheyingshe* 摄影社 'photo shop', the character *she* 摄 does not include a phonetic radical that provides the information about the sound of the character. The right side radical 曷 has the phonetic representation /nie/, which is different than the sound of the word /she/ 摄 in which it is a part.

6.4 Summary

In this chapter, different speech production models have been reviewed, and the discussion of various types of errors in Chinese has led to the conclusion that speech production mechanisms cannot be described with an over-emphasis on either psychological or linguistic aspects, or without looking at other factors that influence the whole speech production process. Rather, a unified speech production model should consider not only the psychological states of the speaker and the grammatical structures of language in general, but also should account for the language-specific characteristics in different languages and socio-cultural norms in different linguistic communities causing errors of different types that have been little noticed in previous error studies.

Speech errors occur in the process in which speech intentions are transformed into overt utterances. Such an intention becomes a verbal structure through a set of cognitive and physical processes, and no single psychological state or single grammatical rule can determine the whole process. These activities must occur in a fixed order rather than at random, just as speech errors do not randomly occur. In order to account for such an ordered set of processes, Garrett's functional-positional two-stage model seems to describe better the overall language production process, and it is supported by error data in Chinese. Levelt's speech production schema summarizes the basic principles of Garrett's model, and further explains how functional and positional processing work in general speech production settings. The discussion of the "photo shop" sentence in Chinese further illustrates how such a functional-positional approach accounts for the different types of errors in Chinese.

Speech errors in Chinese have been useful in identifying the problems which arise from some of the established theories and help to choose among the alternative language production models. But more studies are necessary in the field of speech error and their implication of the human lexicon and its access in the course of language production, and certainly more research on the nature of speech errors in languages like Chinese is essential.

Chapter 7

Conclusion

The main purpose of this dissertation has been to look for the similarities and differences between speech behavior in Chinese and English, in order to ascertain whether speakers in different languages, influenced by different linguistic or non-linguistic factors, follow the same speech production procedures, and how these can be best described by a unified speech production model. Various questions about speech production were raised in the introduction to this dissertation. After discussion and analysis of Chinese speech errors of different types on the testing ground of the various speech production models found in the literature, we now offer the following conclusion.

First of all, the speech error phenomenon is universal. Speech errors occur in normal Chinese speech in much the same patterns as they do in other languages. The different types of errors discussed in this dissertation match most classifications of speech errors in English, suggesting that speech is processed in linguistic units (e.g., phonemes, syllables, words) which can be moved, changed, switched, replaced, or omitted in the course of speech production. There is little doubt that speech errors occur in all natural languages since language in general consists of different syntactic structures, different phonological segments and different semantic features. So long

as there are different choices at different levels for the production of a speech utterance, there are chances for errors to occur.

Furthermore, a speech utterance is the consequence of speech plans being executed through cognitive and articulatory activities. From a logical point of view, as Reason (1982) observes, error is intimately bound up with notions like intention, goal, and plan. The success or failure of our actions can only be judged by the extent to which they achieve, or are on the way to achieving, their planned consequences. It therefore seems that the definition of error must incorporate three concepts: plans, actions, and consequences. Plans govern the nature, order, and time-scale of a sequence of actions, either overt or covert, leading to a particular outcome. Actions are the vehicle by means of which abstract plans are transformed into designed auditory consequences. Consequences, however, reflect the success or failure of the plans or the actions, or sometimes reflect unforeseeable influences that are beyond the control of the speaker, such as a sudden change in the speaker's cognitive or physical state, or in the speech context, which interferes with the plans and actions. Errors can occur either with respect to the plans (e.g., you plan to utter two sentences at the same time, or change from one plan to another), or with respect to the actions (e.g., wrong selection of lexical items or misapplication of grammatical rules), or simply with respect to the consequences for reasons unpredictable or beyond the speaker's expectation (e.g., you are primed to say X to follow a certain pattern Y where X is appropriate, but by the time X is processed and finally uttered, you realize the pattern has been suddenly changed to Z where and X becomes inappropriate, as shown in Chinese cross-talks and "joke-yolk" experiments).

In the most general case, an error occurs when planned speech action fails to achieve its desired articulatory or acoustic consequences. But in actual speech, such

failures are sometimes mended by the linguistic awareness of the interlocutors in a given speech context. Slips of the ear or phonological biases contribute to the fact that many speech errors are ignored or even not noticed. However, errors that are politically or social culturally sensitive (e.g., the case of *Franks* → *Fag*) that involve dramatic meaning change (e.g., the case of *success* → *sex*) can hardly escape the listeners. In whatever language, to transform a speech intention into a well-formed verbal sentence, a speaker has to use the right linguistic and non-linguistic knowledge to plan for the right message structure, be in the right cognitive state to retrieve the right lexical items, follow the right mental processing procedure to assemble the speech segments into the right sentence structure, and execute the right articulatory movement in order to produce the planned output. The different types of speech errors in Chinese indicate that speakers undergo all these ordered steps in the course of speech production, and malfunctions occurring at these steps in the processing mechanism cause errors to occur. The sequence of plan-action-consequence in speech production is experienced by speakers of all languages. Success or failure of planned actions is not determined solely by the language spoken, but by many linguistic and non-linguistic factors, including those that are unforeseeable. Therefore, to err in speech is natural, human, and universal.

Secondly, despite the universality of speech errors, language-specific characteristics of Chinese are reflected in the kinds of speech errors that are often unaccounted for or neglected by Western language production theories. Such errors are not shared universally, but are unique to a certain individual language, or to a certain type of language. Tonal errors in Chinese indicate that Chinese speakers undergo a special phonological processing step for tonal specification, a cognitive activity that is taken for granted by speakers of a non-tonal language. Speakers of Chinese carry an extra set of rules for tonal encoding in the speech production

mechanism as do speakers of other tonal languages. Errors that occur in this subdomain of speech production are easily neglected by researchers who base their studies on non-tonal language errors. Also, the logo-phonographic errors suggest that the special features of the Chinese writing system can be used as clues for lexical retrieval through mental visualization, a processing means not reported utilized by speakers of alphabetic languages. The advantage of such a processing strategy is that speakers can obtain the phonological information of a retrieved lexical item through the phonetic radical (when the lexical item is of low frequency and difficult to retrieve). The disadvantage is that such phonetic radicals sometimes do not carry the phonological representation of the characters they are a part of, leading speakers to make errors.

Thirdly, speech planning and the execution of speech plans are influenced by socio-cultural characteristics of a language. A speaker's socio-cultural or even political values can determine the kind of speech plans to be made and the lexical items to be selected. Language and culture are different cognitive and social entities, but they are closely related. A particular culture is often represented by a language, communicating most of a society's concerns. Non-linguistic conceptual differences (e.g., differences in social and cultural values) often match linguistic differences. For example, there are usually competing names for a given object, but people choose among possible names by selecting a name at the optimal level of utility which is neither too general nor too specific. But this level is determined by the social values of a community rather than by any individual. English speakers regard the term "cousin" to be at the optimal level for the naming of a relative with whom one shares "cousinship", but Chinese speakers, influenced by social norms such as Confucianism, need to be more specific (e.g., gender, age, and blood-relationship), and hence they go a few levels further down this kinship hierarchy. A language like

Chinese with a complex kinship system increases the processing load of a speaker with a large number of related, but rather specific, lexical items, leaving more chances for errors to occur in this area. In contrast, a language like English with a relatively simple kinship system makes its speaker worry less about choosing the wrong terms, since one term in English (e.g., *uncle*, *cousin*, *in-law*) is “specific” enough, covering a large range of related terms in Chinese. Therefore, English errors that involve kinship terms are relatively rare while they are common in Chinese. Such speech errors that involve a speaker’s social values have received little attention in the literature of error studies, since most psycholinguists who work on speech errors focus on the psychological or linguistic aspects of language production, leaving the socio-cultural part of the picture for sociologists, sociopsychologists, or sociolinguists.

Although speech errors occur in normal speech at a very low rate, they reflect the cognitive activities in the course of speech production that error-free speech obscures. Error researchers have proposed numerous speech production models based on the accumulated body of error data, mostly in Indo-European languages. Some of these models can explain the occurrence of errors of different types in these languages quite well, but others seem to need modification. But most of these models do not cover the language-specific variations of speech production and the socio-cultural influences on speech behavior that are clearly presented in Chinese speech errors. Therefore, more research is needed to find a unified speech production model that accounts for all types of speech behaviors. Such a unified model should not over-emphasize either the linguistic rules and constraints of speech, or psychological factors such as hidden anxiety or voluntary control in the speech production process. Neither a purely linguistic analysis (e.g., Fay’s transformational model) nor a purely psychological analysis (e.g., the Freudian slip hypothesis) will truly solve the puzzle

of speech errors. a by-product of a complex cognitive activity with combined efforts from the speaker's internal and external systems. Such systems include strategic planning, reasoning, emotion, socio-cultural values, linguistic processing, visual-auditory stimulation, motor control of articulatory movement, and a self-monitoring system. All these systems work simultaneously in the course of speech production, but each individual meaningful utterance (e.g., a sentence) should be processed through an ordered set of stages, as in the sequence of plan-action-consequence. Interactive activation takes place between processed segments at the same level (e.g., different plans at the planning level, different grammatical structures and lexical items at the functional level, and morphological and phonetic components at the positional level), or from one level down to the next level, but not from bottom up across stages. Taking both linguistic and psychological factors into consideration, and when slightly extended to cover the socio-cultural aspects of speech errors, Garrett's two-stage speech production model and its modification in Levelt's over-all language production schema account best for the speech production process and the errors that occur therein.

Finally, there are no statistics so far on error rate differences across different languages, even the estimation about word selection error rate varies greatly between one word per million (Levelt 1989) and 0.25 - 2.3 per thousand words (Bock & Levelt 1994). But some language-specific features can decide the likelihood for certain types of errors. Research on Chinese speech error is far less developed than in the case of English, and error rates in the two languages cannot be compared directly since the corpus of recorded Chinese speech errors is much smaller than that in English. There can be many reasons for the small error database in Chinese from a much larger Chinese-speaking population. It may just so happen that speech errors in Chinese do not attract researchers' attention as much as the "hot" topics in Chinese

syntax, phonology, or semantics. It may also be suggested that, due to the specific characteristics of the language, Chinese speakers tend to make fewer errors in certain language areas than English speakers. Scholars like Stemberger (personal communication) doubt that Chinese speakers could err at a lower rate than English speakers since speech errors involve the speech production mechanisms rather than the language *per se*. However, if we compare the individual language aspects of the two different languages (English vs. Chinese), it cannot be ignored that certain features of Chinese can indeed limit the chances for occurrence of errors.

In the extant Chinese error data (e.g., Zhang 1990, Moser 1991, Shen 1992), including my own collection, the number of syntactic errors is small. This has much to do with the fact that Chinese has a more flexible syntactic structure in terms of tensing, case-marking, pro-dropping, as well as person-number agreement. Chinese also has a much simpler inflectional and derivational system though research has shown a tendency of borrowing foreign affixation systems in Chinese (e.g., Leong 1995). Without such structural restrictions, a Chinese speaker has more “freedom” in structuring a sentence with less chance of making grammatical mistakes. On the other hand, the simplicity of Chinese syllabic structure also eliminates many possible error sequences that we see so commonly in English. English allows for consonant clusters at both syllable-initial and syllable-final positions, creating various “complex” syllabic skeletons such as CCVC (*slip*), CVCC (*lapse*), CCCVC (*splash*), CVCCC (*helps*), and CCVCC (*slips*). In contrast, the fullest Chinese syllable contains no more complex skeleton than a CVC structure¹ (e.g., *ren* ‘person’). If an error simply involves a change of the sequence order of the phonemes in a syllable as we often see in phonological errors, then from a merely mathematical point of view,

¹ This claim is made under the assumption that glide in a Chinese syllable is treated as a feature associated with the initial but not part of the final (see discussion in Chapter 4).

a three-phoneme syllable can have 6 different phoneme combinations, a four-phoneme syllable can have 24 different combinations, while a five-phoneme syllable can have as many as 120 possible different sequences. Therefore, it is possible for an English syllable to have twenty times the chance of being wrongly produced as a Chinese syllable. Although this simple comparison does not count the many non-existent phoneme combinations in the English and Chinese syllable structures, it still shows that the relative simplicity of the Chinese syllabic structure greatly reduces the error rate, at least at the level of phoneme sequencing, and also partially explains why English errors are more often noticed than Chinese errors. On the other hand, Chinese speakers may err at a much higher rate in other language sub-areas such as tones and sociocultural terms, as is discussed in the previous chapters. Given that speakers err at significantly different rates in different language sub-areas, speech production models should describe at what stage errors are inhibited in a certain language, but not in others. If such a difference in error rate is not taken into consideration in error analysis, we are missing important information needed for speech production modeling to precisely account for speech behaviors across languages. So far as we know, language can be produced in only so many patterns cross-linguistically, and speech errors, though there might be other types that have not been classified or discussed in the literature, are all within the reach of our research. Differences in error types and frequencies in different languages cannot discount the notion of “diverse oneness” (DeFrancis 1989) in human language production.

In sum, speech error is a cross-linguistic phenomenon that has both theoretical and practical implications. Studies of speech errors aim at searching for an understanding of the cognitive process of speech production in natural languages. Such a process is now known to involve linguistic, psychological, and socio-cultural

factors that control or influence the speech production mechanisms at different stages and at different levels. However, more research is needed to reveal to a further degree the interrelationship between these stages and levels in order to thoroughly understand how errors occur in the first place and how our mind is engineered and operated with respect of speech production. Speech error, the window of the human mind, is open for such further research on the part of the erring human beings.

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Appendix

Chinese Speech Error Data

Phonological Errors

Anticipation

Anticipation of syllable initials

- | | | |
|----|--|-----------------------------------|
| 1 | <u>chūn</u> qiū dà mèng 春秋大梦
'big spring-autumn dream' | → gūn qiū dà mèng |
| 2 | zuì <u>qián</u> miàn xiěde 最前面写的
'what is written at the very beginning' | → zuì <u>mián</u> miàn xiěde |
| 3 | <u>zuò</u> guǎng gào 做广告
'making advertisement' | → guò guǎng gào |
| 4 | chī le ān dìng cái shuì 吃了安定才睡
'not sleep until take sleeping-pills' | → chī le <u>dān</u> dìng cái shuì |
| 5 | kā <u>fēi</u> hú 咖啡壶
'coffee pot' | → kā <u>huēi</u> hú |
| 6 | <u>jiǎng</u> zhīqīng zǐnǚ 讲知青子女
'talk about the children of the educated youth' | → <u>zhǎng</u> zhīqīng zǐnǚ |
| 7 | shàng <u>chū</u> zhōng 上初中
'go to junior high-school' | → shàng <u>zhū</u> zhōng |
| 8 | tài jí <u>quán</u> 太极拳
'Taiji boxing' | → tài qí quán |
| 9 | <u>māma</u> wǎnshàng lái jiē nǐ 妈妈晚上来接你
'Mommy will come to pick you up in the evening' | → <u>wāwa</u> wǎnshàng lái jiē nǐ |
| 10 | <u>fēi</u> huā 飞花
'flying flowers' | → <u>huēi</u> huā |
| 11 | xiǎo lǐ de zhè fān <u>zhōng</u> gào 小李的这番忠告
'Xiao Li's sincere advice' | → zhè fān gōng gào |
| 12 | yīngwén lǐ <u>jiā</u> zhōngwén 英文里加中文
'mix English with Chinese' | → yīngwén lǐ <u>zhā</u> zhōngwén |

- | | | |
|----|---|-----------------------------------|
| 13 | lín chǎng fā huī 临场发挥
'improvisation' | → lín chǎng huā huī |
| 14 | shè huì jīng wěi 社会经纬
'viewing across the society' | → shè wèi jīng wěi |
| 15 | qiángpò chéngkè gòu piào 强迫乘客购票
'force passengers to buy tickets' | → chángpò chéngkè gòu piào |
| 16 | ruǎn yǐnliào 软饮料
'soft drinks' | → yuǎn yǐnliào |
| 17 | tuìxiū yǐhòu 退休以后
'after retirement' | → tuìhòu yǐhòu |
| 18 | mǎi shuāng lǚ yóu xié 买双旅游鞋
'buy a pair of sneakers' | → mǎi shuāng yǔ yóu xié |
| 19 | qìchē sījī 汽车司机
'bus driver' | → jìchē sījī |
| 20 | xiǎo yǎn pí yì mǎda 小眼皮一抹搭
'a wink of the eye' | → xiǎo yǎn mí yì mǎda |
| 21 | jiǎn dān jièshào 简单介绍
'briefly introduce' | → jiǎn shān — jiǎn dān jièshào |
| 22 | jǐng shuǐ bú fān hé shuǐ 井水不犯河水
'well water and river water do not mix' | → jǐng fēi bú fān hé shuǐ |
| 23 | quán zhōngguó guǎng dà de rénmin
全中国广大的人民
'the broad mass of people all over China' | → quán gōngguó guǎng dà de rénmin |
| 24 | zhè yàng de xiànxàng 这样的现象
'such phenomenon' | → zhè xiàng de xiànxàng |
| 25 | cài dāo hé cài bǎn 菜刀和菜板
'kitchen knife and chopping board' | → cài bāo — cài dāo hé cài bǎn |
| 26 | měnggǔ rén de fēng — shēnghuó fāng shì 蒙古人的 fēng — 生活方式
'the life style of the Mongolians' | |
| 27 | lǎokǔ — lǎohǔ kàn wǒ 老 ku — 老虎看我
'the tiger is looking at me' | |
| 28 | chòu yú làn xiā 臭鱼烂虾
'stinking fish and shrimps' | → lòu yú làn xiā |
| 29 | děng rén yóu guòqu 等人游过去
'wait till they swim by' | → děng yén yóu guòqu |
| 30 | chū bǎn de xīn shū 出版的新书
'newly published books' | → shū bǎn de xīn shū |

- 31 bǐ qùnián miáotiao 比去年苗条
'(you are) slimmer than last year'
→ bǐ qùtián miáotiao

Anticipation of finals

- 1 lín shí hù kǒu 临时户口
'temporary resident ID'
→ lín shú hù kǒu
- 2 jiāo diǎn fǎng tán 焦点访谈
'focal reports'
→ jiāo diǎng fǎng tán
- 3 pà fā guāng de dōng xi 怕发光的东西
'afraid of glowing things'
→ pà fāng guāng de dōng xi
- 4 dài mài mén piào 代卖门票
'also sell door tickets'
→ dài mèn mén piào
- 5 tā yè yǐ jì rì dì gōng zuò 他夜以继日地工作
'he works day and night'
→ tā yì yǐ jì rì dì gōng zuò
- 6 yīng yǔ lǐ de xū nǐ yǔ qì 英语里的虚拟语气
'the subjunctive mood in English'
→ yīng yǔ lǐ de xī nǐ yǔ qì
- 7 jù lí tài yuǎn 距离太远
'the distance is too far'
→ jì lí tài yuǎn
- 8 guì huā 桂花
'sweet-scented osmanthus'
→ guà huā
- 9 lěng bīng bīng 冷冰冰
'icy cold'
→ lǐng bīng bīng
- 10 liù mántou 溜馒头
'heat up steamed buns'
→ lòu mántou
- 11 tā zài nà dāng dàifu 她在那当大夫
'she works there as a doctor'
→ tā zài nà dāi — dāng dàifu
- 12 chī pútao bú yòng bō pí 吃葡萄不用剥皮
'eating grapes does not need to peel the skin'
→ chī pítào bú yòng bō pí
- 13 tā shuō guò yǐ hòu 他说过以后
'after he has spoken'
→ tā shuō gòu yǐ hòu
- 14 cóng xiāng gǎng fēi wēn gē huá 从香港飞温哥华
'fly from Hong Kong to Vancouver'
→ cóng xiāng gǎng fēn wēn gē huá
- 15 jīn róng jī gùo jiè dài zhì dù 金融机构借贷制度
'the loan and credit systems of financial organizations'
→ jīn róng jiē gùo jiè dài zhì dù
- 16 bǎi tīng bú yàn 百听不厌
'worth hearing a hundred times'
→ bǎi tīn bú yàn
- 17 shǒu xiān qiáng diào 首先强调
'first emphasis'
→ shǒu xiāng qiáng diào

- 18 zán háizi hǎo 咱孩子好 → zán háozi hǎo 咱孩子好
 'our child is good'

Anticipation of phonological features

- 1 biǎo tiáo le ma 表调了吗 → diǎo tiáo le ma
 'Have you adjusted your watch?' [+alveolar]
- 2 tā dài tuán wěi shūjì 他代团委书记 → tā duài tuán wěi shūjì
 'he represents the league secretary' [+rounded]
- 3 dōng shān zài qǐ 东山再起 → dōng sān zài qǐ
 'to start all over again' [-retroflex]
- 4 tǎng zài bèi wō lǐ 躺在被窝里 → pǎng zài bèi wō lǐ
 'lie in bed under the quilts' [+bilabial]
- 5 xǐ huān chī cù 喜欢吃醋 → xǐ huān cǐ cù
 'like to eat vinegar' [-retroflex]
- 6 rén shù zú gòu 人数足够 → rén sù — rén shù zú gòu
 'enough people' [-retroflex]
- 7 bié dài tài duō 别带太多 → bié tài tài duō
 'don't bring too much' [+aspirated]
- 8 zhǒng zú wèntí 种族问题 → zǒng zú wèntí
 'racial problems' [-retroflex]
- 9 pǎo dào wèi lǐ 跑到胃里 → tǎo dào wèi lǐ
 'run into the stomach' [+alveolar]
- 10 jī pí gēda 鸡皮疙瘩 → jī tí gēda
 'gooseflesh' [+alveolar]
- 11 gè rén de lìshǐ zìjǐ xiě 个人的历史自己写 → gè rén de lìshǐ — lìshǐ zìjǐ xiě
 'one's history is written by himself' [-retroflex]
- 12 tā yě shì xié dài zhě 他也是携带者 → tā yě shì xié zài zhě
 'he is also a carrier' [+dental]

Anticipation of syllable/word

- 1 jiè shào yí xià 介绍一下 → jiè xià yí xià
 'give a little introduction'
- 2 zhōng guó duì cǐ fān chū zhàn 中国队的此番出战 → chǔ fān chū zhàn
 'this round for the Chinese team'
- 3 yì tiáo fùguó fùmín de lù 一条富国富民的路 → yí fù — yì tiáo fùguó fùmín de lù
 'a road to the wealth of the country and people'

- 4 zǒu jiē chuàn xiàng 走街串巷 → zǒu xiāng chuàn xiàng
 'to walk into every street and lane'
- 5 duì xuè guǎn zào chéng yā lì 对血管造成压力 → duì xuè yā zào chéng yā lì
 'create pressure on the blood vessels'
- 6 zhè běn míng — zhè běn shū de míngzi jiào shénme?
 这本 míng — 这本书的名字叫什么 'What is the name of this book?'
- 7 yào jiǎo — yào zhǎo jiāo zhōng wén de 要 ǎo — 要找教中文的
 '(They) want to look for Chinese teachers'
- 8 bǎ wánjù shōu qǐ lái 把玩具收起来 → bǎ shōujù shōu qǐ lái
 'put away the toys'
- 9 nǐ kào biān, wǒ cā dì 你靠边, 我擦地 → nǐ cā biān, wǒ cā dì
 'you stand aside. I mop the floor'
- 10 mài shǒudiàn de nège — nège — mài shǒutào de nège diàn
 卖手diàn 的那个 — 那个 — 卖手套的那个店 'the shop that sells gloves'
- 11 xiǎo chéng bù tíng 小城不停 → xiǎo tíng — xiǎo chéng bù tíng
 'they don't stop at small towns'
- 12 píng zi dōu kōng le 瓶子都空了 → kōng zi dōu kōng le
 'bottles are all empty'
- 13 bǎ dèngzi wǎng zhèr nòng 把凳子往这儿弄 → bǎ zòngzi wǎng zhèr nòng
 'move the bench over here'
- 14 qián bù jiǔ cái zhīdào 前不久才知道 → qián bù zhī jiǔ cái zhīdào
 'didn't know until not long ago'
- 15 nǐ qù tú shū guǎn ma 你去图书馆吗 → nǐ tù — qù tú shū guǎn ma
 'are you going to the library?'

Perseveration

Perseveration of initials

- 1 hěn qīng xián 很清闲 → hěn qīng qián
 'very leisurely and free'
- 2 pì téng 屁疼 → pì péng
 'pain on the buttocks'
- 3 guà zài kòu shàng 挂在扣上 → guà zài gòu shàng
 'hook it to the button'
- 4 jīn nián de yíng lì 今年的盈利 → jīn nián de níng lì
 'this year's profit'
- 5 zài zhī jiā gē 在芝加哥 → zài zhī jiā zhē
 'in Chicago'

- 6 yào ràng zuǒ yòu línjū zhīdào 要让左右邻居知道 → yào ràng zuǒ ròu línjū zhīdào
'should let the neighbors know'
- 7 niàn wán líng qī líng niàn zhèige 念完零七零念这个 → niàn wán líng qī líng liàn zhèige
'after reading 070, read this'
- 8 bú gòu gāo 不够高 → bú gòu bāo
'not tall enough'
- 9 yí kuài sì máo bā yí dài 一块四毛八一袋儿 → yí kuài sì máo bā yí bài
'one dollar and forty-eight cents per bag'
- 10 dài dú guòchéng dāng zhōng 带毒过程当中 → dài dú guòchéng dāng dōng
'in the process of working with virus'
- 11 zhēng xiān kǒng hòu 争先恐后 → zhēng xiān kǒng kòu
'strive to be the first and fear to lag behind'
- 12 wù zhì wén míng jiànshè 物质文明建设 → wù zhì wén wéng jiànshè
'the construction of material civilization'
- 13 zhèr yǒu bàn ge guā 这儿有半个瓜 → zhèr yǒu bàn ge bā
'here is half a melon'
- 14 qì wèi huī fā chū lái 气味挥发出来 → qì wèi huī huā chū lái
'the odor has volatilized'
- 15 chéng tiān chǎo jià 成天吵架 → chéng tiān tǎo jià
'to quarrel everyday'
- 16 dào jīn tiān zǎochen 到今天早晨 → dào jīn tiān dǎochen
'up to this morning'
- 17 bǎ nǐ liǎn xǐ gān jìng 把你脸洗干净 → bǎ nǐ niǎn xǐ gān jìng
'wash your face clean'
- 18 huān yíng rì běn dài biǎo tuán 欢迎日本代表团 → huān yíng yì běn dài biǎo tuán
'welcome Japanese delegation'
- 19 fāng shàng wǎng xià diào huī 房上往下掉灰 → fāng shàng wǎng xià diào fēi
'dust is falling from the ceiling'
- 20 fǎ hàn hàn fǎ 法-汉、汉-法 → fǎ hàn hàn fǎ
'French-Chinese, Chinese-French (dictionary)'
- 21 pū kè pái 扑克牌 → pū kè kái
'playing cards'

Perseveration of finals

- 1 bǎ tóufā sǎn kāi 把头发散开 → bǎ tóufā sǎ kāi
'loosen up your hair'
- 2 fèng mìng xiě wénzhāng 奉命写文章 → fèng mèng xiě wénzhāng
'write the article under orders'

- | | | |
|---|---|---|
| 3 | jiědá le hěn duō wèntí 解答很多问题
'answered many questions' | → jiědá le hěn dā wèntí |
| 4 | zài jīchǎng dòuliú 在机场逗留
'stay in the airport' | → zài jīchǎng dòulóu |
| 5 | yòng wéisà kǎ fù 用维萨卡付
'pay with Visa card' | → yòng wéisà kǎ fèi |
| 6 | zhège zhuānyè bù hǎo zhǎo gōngzuò
这个专业不好找工作
'this major is difficult to find a job' | → zhège zhuānyè bù hǎo zhuǎn
gōngzuò |
| 7 | bié zǒu guò le 别走过了
'don't miss the place' | → bié zǒu gòu le |
| 8 | xià pǎo le 吓跑了
'scared away' | → xià pǎ le |
| 9 | A: yì nián zhī nèi yǒu xiào? 一年之内有效?
'is it valid within a year?' | B: duì 对 → diào
'yes' |

Perseveration of features

- | | | |
|----|--|---|
| 1 | bù néng nuó 不能挪
'cannot be moved' | → bù néng muó
[+bilabial] |
| 2 | gèng guān xīn 更关心
'more caring' | → gèng gān xīn
[-rounded] |
| 3 | Sīmǎ Guāng zá gāng 司马光砸缸
'Sima Guang broke the jar' | → Sīmǎ Guāng zá guāng
[+rounded] |
| 4 | kě shù míng cí 可数名词
'countable nouns' | → kě shǔ míng chí
[+retroflex] |
| 5 | sìshí 四十
'forty' | → sìsí
[-retroflex] |
| 6 | tèshū de dàn 特殊的蛋
'special eggs' | → tèshū de tàn
[+aspirated] |
| 7 | zuì zhōng 最终
'finally' | → zuì zōng
[-retroflex] |
| 8 | xiě bú shàng zì 写不上字儿
'cannot write the character on' | → xiě bú shàng zhìr
[+retroflex] |
| 9 | liǎng dào sān zhōu 两到三周
'two to three weeks' | → liǎng dào sān zōu
[-retroflex] |
| 10 | zìjǐ de lù zìjǐ chuǎng 自己的路自己闯
'one should make one's own path' | → zìjǐ de lù zìjǐ cuǎng
[-retroflex] |

Perseveration of syllable/word

- | | | |
|----|---|---|
| 1 | qù túshūguǎn zhǎo ziliào 去图书馆找资料
'go to library to find reference materials' | → qù túshūguǎn zhǎo túliào |
| 2 | júbù má zuì 局部麻醉
'local anesthesia' | → jú bù má bù |
| 3 | biǎndàn cháng, bǎndèng kuān 扁担长, 板凳宽
'the carrying pole is long, the bench is wide' | → biǎndàn cháng, biǎndèng kuān |
| 4 | tā mǎile yì píng lǎochōu, huíjiā yì chī, tài xián
他买了一瓶老抽, 回家一吃, 太咸.
'He bought a bottle of soy sauce. When he got home to try it, he found it too salty' | → tā mǎile yì píng lǎochōu, huíjiā yì chōu, tài xián. |
| 5 | shōu shuǐ fèi 收水费
'to collect hydro payment' | → shōu shuǐ shuì |
| 6 | biān tīng yīnyuè biān xiě zuòyè
边听音乐边写作业
'listening to music while doing homework' | → biān tīng yīnyuè biān xiě yīnyuè |
| 7 | ná zhe hétong, sìchù jìnxíng qīpiàn huódòng
拿着合同, 四处进行欺骗活动
'taking the contract everywhere to do fraudulent activities' | → ná zhe hétong, sìchù jìnxíng qīpiàn hétong |
| 8 | píngzhuāng yǐnliào shǎo mǎi 瓶装饮料少买
'do not buy too many bottled drinks' | → píngzhuāng yǐnliào shǎo yǐn |
| 9 | dài shàng kǒuzhào, shǒujuànr 带上口罩, 手绢儿
'bring your mask and handkerchief' | → dài shàng kǒuzhào, kǒujuànr |
| 10 | fēn hóng fèng huāng 粉红凤凰
'pink pheonix' | → fēn hóng hòng fāng |
| 11 | zhǎo gōng zuò 找工作
'look for job' | → zhǎo gōng zhào |
| 12 | chī fàn ba, guō lǐ yǒu miàntiáo 吃饭吧, 锅里有面条
'eat your meal, there are noodles in the wok' | → chī fàn ba, guō lǐ yǒu fàntiáo |
| 13 | nán fēi duì méi yǒu jǐge hēi rén →
南非队没有几个黑人 'there are not many black athletes in South African Team' | nán fēi duì méi yǒu jǐge fēi rén |
| 14 | nèi xiǎo hái er shuō bànge xiǎoshí jiù gòu le
那小孩儿说半个小时就够了 'that child said half an hour is enough' | → bànge xiǎoháir jiù gòu le |

Ambiguous sources (anticipation or perseveration)

- | | | |
|---|--|-----------------------|
| 1 | gēn māo gǒu yí yàng 跟猫狗一样
'same as cats and dogs' | → gēn gāo gǒu yí yàng |
| 2 | jiù yè jī huì 就业机会
'employment opportunity' | → jiù jiè jī huì |

- | | | |
|----|--|------------------------------|
| 3 | jīn wǎn bā diǎn bàn 今晚八点半
'at eight thirty this evening' | → jīn wǎn bā biǎn bàn |
| 4. | shí shì shí, sì shì sì 十是十, 四是四
'ten is ten, four is four' | → shí shì shí, sì sì sì |
| 5 | tāmen dōu zhǎo dào le 他们都找到了
'they all found (jobs)' | → tāmen dōu dǎo dào le |
| 6 | dōu zhème zǎo dì húilái le 都这么早地回来了
'all came back so early' | → dōu zhème dǎo dí húilái le |
| 7 | bǎ bàn kuài guā bāo shàng 把半块瓜包上
'wrap up the half melon' | → bǎ bàn kuài bā bāo shàng |
| 8 | yí rì yóu 一日游
'one-day tour' | → yí yì yóu |
| 9 | chún mián chèn shān 纯棉衬衫
'pure cotton shirt' | → chún mián chàn shān |
| 10 | wǎng jiā dǎ diàn huà 往家打电话
'make a call home' | → wǎng jiā dǎ diàn huà |
| 11 | jiānádà duōlúndū dàxué 加拿大多伦多大学
'University of Toronto in Canada' | → jiānádà duōlúndā dàxué |

Metathesis (exchanges)

Exchange of initials

- | | | |
|---|---|----------------------|
| 1 | guī fān huà 规范化
'standardization' | → guī huàn fā |
| 2 | xiāng hù lǐ biǎo 相互里表
'mutually interdependent' | → xiāng hù bǐ liǎo |
| 3 | yí qiè tōng chàng 一切通畅
'all is unobstructed' | → yí qiè chōng tòng |
| 4 | bù ruǎn bú yìng 不软不硬
'not soft, nor hard' | → bù yuǎn bú rìng |
| 5 | zhè shā fā tǐng dà 这沙发挺大
'this sofa is big' | → zhè fā shā tǐng dà |
| 6 | liè níng géle 列宁格勒
'Leningrad' | → niè líng géle |
| 7 | xiǎo jī bú huì fēi 小鸡不会飞
'little chicks can not fly' | → xiǎo jī bú fēi huì |
| 8 | fǎn lǎo huán tóng 返老还童
'rejuvenate' | → huǎn lǎo fán tóng |

- 9 zài chuáng shang tǎng zhe 在床上躺着
'lying in bed' → zài táng shang chuǎng zhe
- 10 yǒu wàng duó guān 有望夺冠
'there is hope to win the championship' → yǒu guàng duó wàn
- 11 róng guāng huànfā 容光焕发
'looks bright and healthy' → róng guāng fàn huā

Exchange of finals

- 1 wǒ gū jì 我估计
'I predict' → wǒ guī jù
- 2 nǐ bǎ tuō bù tóu le ma? 你把托布投了吗
'did you rinse the mop?' → nǐ bǎ tōu bù tuó le ma?
- 3 mèng mèi yǐ qiú 梦寐以求
'crave for something even in dreams' → mèi mèng yǐ qiú
- 4 bù yí yú lì 不遗余力
'spare no efforts' → bù yú yí lì
- 5 liù jí lián xù jù 六集连续剧
six-act TV play → liù jú lián xì jù
- 6 wǒ méi gǎn wǎng yuǎn zǒu 我没敢往远走
'I did not dare to walk far away' → wǒ méi gǎng wǎn yuǎn zǒu
- 7 liǎng diǎn 两点
'two o'clock' → liǎ diǎng

Exchange of syllables

- 1 rén mín yínháng 人民银行
'People's Bank' → yín mín rén háng
- 2 qù jiāo fèi 去交费
'go to pay the fee' → qù fèi jiāo
- 3 shòu chǒng ruò jīng 受宠若惊
'feel extremely flattered' → shòu jīng ruò chǒng
- 4 liǎng dì fēn jū 两地分居
'live in separate places' → liǎng jù fēn dī
- 5 huáng xiāng jiāo píng guǒ 黄香蕉苹果
'yellow banana-apples' → huáng jiāo xiāng píng guǒ
- 6 wén xué míng zhù 文学名著
'famous literary works' → míng xué wén zhù
- 7 jiǎo wǎng guò zhèng 矫往过正
'to overdo in righting a wrong' → guò wǎng jiǎo zhèng

- 8 wǒ bìyè bǐ nǐ zhěngzhěng wǎn bā nián 我毕业比你整整晚八年
'I graduated exactly eight years later than you' → wǎnwǎn zhěng bā nián
- 9 yòng biānzi gǎn 用鞭子赶
'to lash away with a whip' → yòng gānzi biǎn
- 10 wǎng duǎn le jiǎn 往短了剪
'cut it short' → wǎng jiǎn le duǎn
- 11 huā le shí èr kuài duō 花了十二块多
'spent over twelve dollars' → huā le shí èr duō kuài
- 12 yǎn kē yǒu ge mǎ dàifu 眼科有个马大夫
'there is a Dr. Ma in the ophthalmological department' → mǎ kē yǒu ge yǎn dàifu
- 13 xīnnián hé shūnjié de shíhou 新年和春节的时候
'at the time of New Year and Spring Festival' → xīnjié hé shūnnián de shíhou
- 14 shì kě ér zhǐ 适可而止
'stop before going too far' → shì ér kě zhǐ
- 15 wùzhì hé yìshì 物质和意识
'material and consciousness' → wù shì hé yì zhì
- 16 nǐ bǎ yān tóu chā nǎ le 你把烟头插哪了
'where did you put the cigarette butt?' → nǐ bǎ chā tóu yān nǎ le
- 17 tā de rén pǐn tài cì 他的人品太次
'his personal character is too bad' → tā de rén cì tài pǐn
- 18 liǎng piàn chá yè 两片茶叶
'two tea leaves' → liǎng yè chá piàn
- 19 tā qiǎng cí duó lǐ 他强词夺理
'he is unreasonable' → tā qiǎng duó cí lǐ
- 20 xīn ān lǐ dé 心安理得
'feel at ease' → ān xīn lǐ dé
- 21 jìn xíng shāixuǎn 进行筛选
'to conduct selection' → jìn xíng xuānshǐ
- 22 bù chā shàng xià 不差上下
'do not differ much' → bù xiā chàng xià
- 23 máo lí tǎ ní yà 毛里塔尼亚
'Mauritania' → máo nǐ tǎ lí yà
- 24 bǎ qǔzi de jiézòu gǎn tán chūlái 把曲子的节奏感弹出来
'play out the rhythm of the music' → bǎ qǔzi de tán zòu gǎn jié chūlái
- 25 mǎi bànjià piào 买半价票
'buy half-price tickets' → mǎi bànpiào jià

Blends

Blending between initial and final from competing syllables/words

- | | | |
|----|---|-----------------------------|
| 1 | bāo zi / jiǎo zi 包子/饺子
'steamed/boiled Chinese dumplings' | → biǎo zi |
| 2 | lǚ tú / lǚ chéng 旅途/旅程
'trip/itinerary' | → lǚténg |
| 3 | diàn líng / diàn niǔ 电铃/电钮
'electric bell/button' | → diàn liǔ |
| 4 | zǒulù / zǒudào 走路/走道
'to walk' | → zǒulào |
| 5 | fàn diàn / fàn guǎnr 饭店/饭馆儿
'restaurant' | → fàndiǎnr |
| 6 | dǎ huài le / dǎ suì le 打坏了/打碎了
'it is damaged / broken' | → dǎ suài le — dǎ huì le |
| 7 | háizi zuì dǎoméi / kělián 孩子最倒霉/可怜
'the child is the most unfortunate' | → háizi zuì dǎomián |
| 8 | dāndú / dānchún 单独/单纯
'solely/purely' | → dāndún |
| 9 | zhuāng zài dōur li / bāor li 装在兜儿里/包儿里
'put it in the pocket/bag' | → zhuāng zài dāor li |
| 10 | tāmen zài dǎ zhàng / dǎ jià 他们在打仗/打架
'they are fighting' | → tāmen zài dǎ zhà |
| 11 | qiē zhe chī / xuē zhe chī 切着吃/削着吃
'cut/peel it for eating' | → quē zhe chī |
| 12 | zánmen huí jiā zài tán / liáo 咱们回家再谈聊
'let's talk when we get home' | → zánmen huí jiā zài tiáo |
| 13 | jià qián diào / jiàng xià lái le 价钱掉降下来了
'the price has dropped/gone down' | → jià qián diàng xià lái le |
| 14 | zěnmē guǎi / zǒu de 怎么拐/走的
'how could you turn this way' | → zěnmē gǒu de |
| 15 | guān niàn / gài niàn 观念/概念
'concept' | → guài niàn |
| 16 | yǒu tè diǎn / tè xìng 有特点/特性
'to have special characteristics' | → yǒu tè dìng |
| 17 | dìtú shàng de lù / dào 地图上的路/道
'the roads on the map' | → dìtú shàng de lào |

Blending between syllables from competing words

- | | | |
|----|--|-----------------------|
| 1 | jiāowǎng / jiēchǔ 交往/接触
'contact/interact' | → jiāo chǔ |
| 2 | dàlóu de duìmian / pángbiān 大楼的对面/旁边
'across/beside the building' | → ... duì biān |
| 3 | shēngyìrén / shāngrén 生意人/商人
'businessmen/merchants' | → shēngrén |
| 4 | zǔchéng / xíngchéng 组成/形成
'to group up/form up' | → zǔxíng |
| 5 | liáotiān / làokē 聊天/唠嗑
'to chat/talk' | → liáokē |
| 6 | shàng dàng / shòu piàn 上当/受骗
'to be cheated once' | → shàng piàn |
| 7 | sǎngzi huànóng / fāyán le 嗓子化脓/发炎了
'the throat is festering/inflamed' | → sǎngzi huà yán le |
| 8 | shāngdiàn xiàbān / guānmén le 商店下班/关门了
'the shop is closed' | → shāngdiàn xiàmén le |
| 9 | xiāng gǎng dà hēng / fù wēng 香港大亨/富翁
'tycoon/richman from Hong Kong' | → xiāng gǎng dàwēng |
| 10 | shǔ bú shèng shǔ / bú shèng méi jǔ
数不胜数/不胜枚举 'beyond count' | → shǔ bú shèng jǔ |
| 11 | yīng gāi zìjǐ fù / gèrén fù 应该自己付/个人付
'should be paid by the individuals themselves' | → yīng gāi zìrén fù |
| 12 | wǒ méi kāimén, hái diǎnpào 我没开门, 还点炮
'I did not open the door, and also fired the gun (in playing a <i>Majiang</i> game)' | → wǒ méi diǎnmén |
| 13 | bú tài hǎo kàn / piào liang 不太好看/漂亮
'not very beautiful' | → bú tài hǎo piào |
| 14 | wǒ bú yào le / wǒ chī hǎo le 我不要了/吃好了
'I don't want anymore / I've had enough' | → wǒ bù hǎo le |
| 15 | nǐ nǚér jǐ suì le / duō dà le? 你女儿几岁了/多大了?
'how old is your daughter?' | → nǐ nǚér jǐ dà le? |
| 16 | zhēn shì hěn jìn / bù yuǎn 真是很近/不远
'it's really very close/not far' | → zhēn shì hěn yuǎn |
| 17 | yào qiáng / shàng jìn 要强/上进
'to be progressive' | → yào jìn |
| 18 | tā zài jiǎng jiū / xiàohuà nǐ 他在讲究/笑话你
'he is gossiping about/laughing at you' | → tā zài jiǎnghuà nǐ |

Tonal errors

Tonal anticipation

- | | | |
|---|---|-----------------------------|
| 1 | shì chǎng jià gé 市场价格
'market price' | → shì chǎng jiá gé |
| 2 | mòluògē wáng hòu 摩洛哥王后
'the Queen of Morocco' | → mòluògē wánghòu |
| 3 | yuán cǎiliào yǒu wǔ zhǒng 原材料有五种
'there are five kinds of raw materials' | → yuán cǎiliào yǒu wǔ zhǒng |
| 4 | jī nián dà jí 鸡年大吉
'good luck in the year of Rooster' | → jí nián dà jí |
| 5 | xǐhuān zài wàitou — zài wàitou wánr 喜欢在外头玩儿
'like to play outside' | |

Tonal perseveration

- | | | |
|---|---|--------------------|
| 1 | chī huáng gua ma 吃黄瓜吗
'do you eat cucumber?' | → chī huāng gua ma |
| 2 | huǒchē, fēijī 火车, 飞机
'trains and planes' | → huǒchē, fēijī |

Tonal exchange

- | | | |
|---|--|-------------------------|
| 1 | fēn hóng fèng huáng 粉红凤凰
'pinkish red phoenix' | → fēn hǒng fèng huáng |
| 2 | xiǎo zhāng gēn lǎo mǎ 小张跟老马
'Xiao Zhang and Lao Ma' | → lǎo zhāng gēn xiǎo mǎ |

Blending between the sound of a word and the tone of a competing word

- | | | |
|---|---|--------------------------|
| 1 | tā yǐ wǎng / yǐ qián bú zhèyàng 他以往/前不这样
'He was not like this before' | → tā yǐ wǎng bú zhèyàng |
| 2 | wǎng hòu / wǎng huí zǒu 往后/回走
'go backward' | → wǎng hóu zǒu |
| 3 | zhǐ téng / zhǐ tòng piàn 止疼/痛片
'pain killers' | → zhǐ tòng piàn |
| 4 | liǎ rén lǎo / liǎo de tǐng hǎo 俩人儿唠/聊得挺好
'the two had a nice chat' | → liǎ rén láode tǐng hǎo |
| 5 | shū zhǎo bú dào / zhāo le 书找不到/着了
'cannot find the book' | → shū zhǎo bù dào le |

- | | | |
|----|--|---------------------------|
| 6 | liànlían jiù huì / xíng le 练练就会/行了
'it will be all right after some practice' | → liànlían jiù huí le |
| 7 | biǎo duì / tiáo zhǔn le ma 表对/调准了吗
'is the watch correctly set?' | → biǎo duí zhǔn le ma |
| 8 | yǒuyí shāng diàn / shāng chǎng 友谊商店/商场
'Friendship Store' | → yǒuyí shāng diǎn |
| 9 | zhè gūniang hē jiǔ le / hē zuì le
这姑娘喝酒了/喝醉了
'this girl had a drink/was drunk' | → zhè gūniang hē jiù le |
| 10 | dào xiǎo fān / xiǎo tān na mǎi diàn
到小贩/小摊那买 'go and buy at the small pedlers' | → dào xiǎo fān na mǎi |
| 11 | zhù zài jǐ zài yì jiān fáng lǐ 住在/挤在一间房里
'to crowd in one room' | → zhǔ zài yì jiān fáng lǐ |
| 12 | xìng gé zhí shuǎng / tǎn shuài 性格直爽/坦率
'to be frank and straight forward' | → xìng gé zhǐ shuàng |
| 13 | bié tán le / bié kǎn le 别谈了/别侃了
'stop chatting' | → bié tǎn le |

Sandhi changes due to competing words with different tone combinations

- | | |
|---|---|
| 1 | dā (rǎo)... dǎ duàn nǐ yíxià 打(扰)... 打断你一下,
'(excuse me for) interrupting you ...' |
| 2 | dā (shuǐ)... dǎ rè shuǐ 打(水)... 打热水
'to get hot water' |
| 3 | zhège chǎng (suǒ) ... chǎng hé 这个场(所)... 场合
'on this occasion' |
| 4 | zài dà mǎ shàng ... dà mǎ lù shàng bié pǎo 在大马路上... 大马路上别跑
'don't run on the big street' |

Tonal substitution

- | | | |
|---|---|--|
| 1 | xǐ hǎo liǎng ge wǎn 洗好两个碗
'wash two bowls' | → xǐ hào liǎng ge wǎn |
| 2 | xìng gé zhí shuǎng 性格直爽
'frank and straightforward' | → xìng gé zhǐ shuàng |
| 3 | tā hòulái chū jiā le 她后来出家了
'she later went to become a nun' | → tā hòulái chū jià le 她后来出嫁了
'she later got married' |

Addition

Addition of glides (/i/ and /u/)

- | | | |
|----|--|-----------------------------|
| 1 | miàn bāo 面包
'bread' | → miàn biāo |
| 2 | lǎo niáng men 老娘们
'ladies' | → liǎo niáng men |
| 3 | tán dào jiāojiè shǒuduàn 谈到交际手段
'talking about communication methods' | → tán diào jiāojiè shǒuduàn |
| 4 | Sānmáo liú làng jì 三毛流浪记
'the wandering of Sanmao' | → Sānmiáo liú làng jì |
| 5 | xiǎo máo bìng 小毛病
'little problem' | → xiǎo miáo bìng |
| 6 | wǒ dā yìng nǐ 我答应你
'I promise you' | → wǒ diā yìng nǐ |
| 7 | zhōng lǎo nián péngyou 中老年朋友
'middle-aged and senior friends' | → zhōng liǎo nián péngyou |
| 8 | zhēng mántou 蒸馒头
steamed bun | → zhēng miántou |
| 9 | dǎ diàn huà 打电话
make a phone call | → dǐǎ diàn huà |
| 10 | yǒu bǎo zhèng 有保证
'have warrantee' | → yǒu biǎo zhèng |
| 11 | tā de bǎo biāo 他的保镖
'his bodyguard' | → tā de biǎo biāo |
| 12 | xià ge lǐ bài 下个礼拜
'next week' | → xià ge lǐ biài |

Addition of initials and syllables

- | | | |
|---|---|--------------------------|
| 1 | yú cì bǐjiào xiǎo 鱼刺比较小
'the fish bone is small' | → yú cì bǐjiào shǒu xiǎo |
| 2 | nǐ zhī bù zhī dào 你知不知道
'do you know or not' | → nǐ zhī bù bù zhī dào |
| 3 | wǒ qù kàn kàn 我去看看
'I go and have a look' | → wǒ qù kàn kàn kàn kàn |

Omission

Omission of glides (/i/ and /u/)

- | | | |
|---|--|-----------------------|
| 1 | lùn wén dá biàn 论文答辩 'thesis defence' | → lùn wén dá bàn |
| 2 | guān xīn 关心 'to care' | → gān xīn |
| 3 | zhàng mǔ niáng 丈母娘 'mother-in-law' | → zhàng mǔ náng |
| 4 | mīào tóu 苗头 'indication of a trend' | → <u>m</u> āo tóu |
| 5 | dà bǎ dà bǎ huā qián 大把大把花钱
spend the money by the handfuls | → dà bǎ dà bǎ hā qián |
| 6 | zài jīchǎng dòuliú 在机场逗留
'stay at the airport' | → zài jīchǎng dòulou |
| 7 | sīmǎ guāng zā gāng 司马光砸缸
'Sima Guang breaks the jar' | → sī mǎ gāng zā gāng |
| 8 | chuāng lián 窗帘 'the curtains' | → chuāng lán |

Omission of non-glide elements and syllables

- | | | |
|---|--|---|
| 1 | liú diǎnr fèng 留点缝
'leave (the door) ajar' | → ióu diǎn fèng |
| 2 | chúfáng 厨房
'kitchen' | → chú-áng |
| 4 | bù zhīdào 不知道
'(I) don't know' | → bù dào |
| 5 | qù mǎi nèige dì dìfāng 去买那个的地方
'go to the place where (they) bought that' | → qù mǎi nèige dìfāng 去买那个地方
'go to buy that place' |
| 6 | shì nǐ qīnàide de láixìn ba?
是你亲爱的的来信吧?
'is it your darling's letter?' | → shì nǐ qīnàide láixìn ba?
是你亲爱的来信吧?
'is it your dear letter?' |

Substitution

Substitution of initials

- | | | |
|---|-----------------------------------|------------------|
| 1 | bí zi 鼻子 'nose' | → pí zi |
| 2 | zhì xiào chuǎn 治哮喘 'treat asthma' | → zhì qiào chuǎn |
| 3 | sǎo dì 扫地 'sweep the floor' | → cǎo dì |
| 4 | cā gān jìng 擦干净 'wipe clean' | → sā gān jìng |
| 5 | yǎo shāng 咬伤 'a bite wound' | → yǎo xiāng |
| 6 | guǎi wanr 拐弯儿 'make a turn' | → guǎi sānr |

- | | | | |
|----|--|---|----------------------|
| 7 | rào le jǐ quānr 绕了几圈儿 'turned a few circles' | → | rào le jǐ cuānr |
| 8 | yōu huì 优汇 'discount price' | → | yōu fèi |
| 9 | mǔ yǔ 母语 'mother tongue' | → | mǔ nǚ |
| 10 | fàng yǎng 放养 'to raise' | → | fàng xiǎng |
| 11 | tài yáng shén 太阳神 'God of the Sun, Apollo' | → | tài yáng qín |
| 12 | lú chún bú duì mǎ zuǐ 驴唇不对马嘴 'incongruous' | → | lú qún bú duì mǎ zuǐ |
| 13 | jiào chén shū 叫陈叔 'call Uncle Chen' | → | jiào qín shū |
| 14 | gù dìng zī chǎn 固定资产 'fixed capital' | → | gù dìng jī chǎn |

Substitution of finals

- | | | | |
|----|---|---|--------------------|
| 1 | yíng yǎng fēng fù 营养丰富 'rich in nutrition' | → | yíng yǎng fēng fèn |
| 2 | bù shǒu xìn yòng 不守信用 'do not keep promise' | → | bù shǒu xìn yùn |
| 3 | bù guāng míng 不光明 'gloomy' | → | bù guāng méng |
| 4 | sàng ǒu 丧偶 'lost spouse' | → | sàng wǒ |
| 5 | tài bàng le 太棒了 'wonderful' | → | tài biàn le |
| 6 | jiē shòu 接受 'accept' | → | jiē shào |
| 7 | gān 肝 'liver' | → | gāng |
| 8 | zhuān jiā 专家 'expert' | → | zhuān jí |
| 9 | yǒu jiǎng wèn dá 有奖问答 'a quiz show' | → | yǒu jiǎn wèn dá |
| 10 | xǐ yī fu 洗衣服 'wash clothes' | → | xiě yī fu |
| 11 | hěn kuān 很宽 'very wide' | → | hěn kuāng |
| 12 | àn mó 按摩 'massage' | → | èn mó |
| 13 | bā bǎi fèn 八百份 'eight hundred copies' | → | bā bǎi fàn |

Syntactic Errors:*Errors with modifiers*

- | | | | |
|---|--|---|---|
| 1 | zhè jǐ gè rén 这几个人
'these people' | → | *zhè jǐ tóu rén 这几头人
'these heads of people' |
| 2 | ná yì bǎ dà qiāng 拿一把大枪
'hold a big gun' | → | ná yì dà bǎ qiāng 拿一大把枪
'hold a big handful of guns' |
| 3 | gěi zhè tiáo dà chuán zhào yì zhāng xiàng
给这条大船照一张相
'take a picture for this big ship' | → | *..... zhào yì tiáo xiàng
给这大船照一条相 |
| 4 | jiē yì dà pén shuǐ 接一大盆水
'get a big basin of water' | → | *jiē yì pén dà shuǐ 接一盆大水
'get a basin of big water' |
| 5 | yì xiǎo píng júzhī 一小瓶桔汁 | → | *yì píng xiǎo júzhī 一瓶小桔汁 |

- | | | | |
|---|--|---|---|
| | 'a small bottle of juice' | | 'a bottle of small juice' |
| 6 | chī yì xiǎo diǎnr fàn
吃一点儿饭
'eat a little bit of rice' | → | * chī yì diǎnr xiǎo fàn
吃一点儿小饭
'eat a bit of little rice' |
| 7 | yǒu yì tiān 有一天
'one day' | → | *yǒu yí gè tiān 有一个天
'there is a heaven' |

Lexical substitution

- | | | | |
|---|---|---|---|
| 1 | shì dāng chǎng suǒ 适当场所
'proper location' | → | shì dāng chǎng hé 适当场合
'proper occasion' |
| 2 | wàijiāobù fāyánrén
外交部发言人
spokesman of the foreign ministry | → | wàijiāobù fāmíngrén
外交部发明人
inventor of the foreign ministry |
| 3 | níyàjiālā pùbù 尼亚加拉瀑布
'Niagara Falls' | → | níjiālāguā pùbù 尼加拉瓜瀑布
'Nicaragua Falls' |
| 4 | shuǐ zhème duō 水这么多
'the water is so much' | → | *shuǐ zhème nóng 水这么浓
'the water is so thick' |
| 5 | huā le hěn duō shíjiān
花了很多时间
spend very much time | → | *huā le hěn dà shíjiān
花了很大时间
spend very big time |
| 6 | bú xìn wèn nǐ bà 不信问你爸
'ask your father if you don't believe' | → | bú xìn wèn wǒ bà 不信问我爸
'ask my father if you' |
| 7 | wǒ de huà nǐ jì bú zhù 我的话你记不住
'you can't remember my words' | → | *wǒ de huà nǐ tīng bú zhù
我的话你听不住 |

Lexical exchange

- | | | | |
|---|---|---|--|
| 1 | bǐ zài shū shàng 笔在书上
'the pen is on the book' | → | shū zài bǐ shàng
'the book is on the pen' |
| 2 | yá gāo zài liǎn pén lǐ 牙膏在脸盆里
'the tooth paste is in the basin' | → | liǎn pén zài yá gāo lǐ
'the basin is in the tooth paste' |
| 3 | nǐ shū tóu xǐ liǎn le ma
你梳头洗脸了吗?
'did you comb your hair and wash you face?' | → | nǐ shū liǎn xǐ tóu le ma
'did you comb your face and wash your hair?' |
| 4 | bǎ jiǎo fàng zài zhuōzi shàng 把脚放在桌子上
'put the foot on the table' | → | bǎ zhuōzi fàng zài jiǎo shàng
'put the table on the foot' |
| 5 | shuǐ jìn wǒ bízi lǐ le 水进我鼻子里了
'water got into my nose' | → | bízi jìn wǒ shuǐ lǐ le
'nose got into my water' |

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|----|--|--|
| 6 | qì de liǎn hóng bózi cū 气得脸红脖子粗
`turn red-face and thick-neck with anger` | → qì de liǎn cū bózi hóng
`... thick-face and red-neck...` |
| 7 | shí céng dān bù rú yì céng mián
十层单不如一层棉
`ten thin shirts are not as warm as one
cotton-patched coat` | → shí céng mián bù rú yì céng dān
`ten cotton-patched coats are
not as warm as one thin shirt` |
| 8 | wǒ jiā shàng yǒu lǎo, xià yǒu xiǎo
我家上有老, 下有小
`I have parents above me and children under me` | → shàng yǒu xiǎo, xià yǒu lǎo
`I have children above me and
parents under me` |
| 9 | shàng yǒu tiān táng, xià yǒu sū háng
上有天堂, 下有苏杭
`there is the Heaven above, and there are
Suzhou and Hangzhou on earth` | → shàng yǒu sū háng, xià yǒu
tiān táng
`there are Suzhou and Hangzhou
above, and the Heaven on earth` |
| 10 | wǒ shēn zhèng bú pà yǐng xié 我身正不怕影邪
`so long as my body is straight, I need not fear
having a crooked shadow` | → wǒ yǐng zhèng bú pà shēn xié
`so long as my shadow is straight,
I having a crooked body` |
| 11 | shuǐ shēn huǒ rè zhī zhōng 水深火热之中
`in deep water and hot fire` | → shuǐ rè huǒ shēn zhī zhōng
`in hot water and deep fire` |
| 12 | xiàtiān rè de yào sǐ, dōngtiān lěng de yào mìng
夏天热得要死, 冬天冷得要命
`summer is extremely hot and
winter is deadly cold` | → dōngtiān rè de yào sǐ, xiàtiān
lěng de yào mìng
`winter is extremely hot and
summer is deadly cold` |
| 13 | nǐ wèile wǒ fàngqì le xuéyè 你为了我放弃了学业
`you gave up studies for me` | → nǐ wèile xuéyè fàngqì le wǒ
`you gave me up for studies` |
| 14 | yì tiáo téng shàng de guā 一条藤上的瓜
`melons on the same vine` | → yì tiáo guā shàng de téng
`vines on the same melon` |
| 15 | yǐ cài dāng fàn 以菜当饭
`eat vegetables as rice` | → yǐ fàn dāng cài
`eat rice as vegetables` |
| 16 | dǎ jiǎ duì 打假队
`anti-fake task force` | → jiǎ dǎ duì
`fake task force` |
| 17 | chōu yān, hē chá 请抽烟, 喝茶
`smoke cigarette and drink tea` | → qǐng hē yān, chōu chá
`drink cigarette and smoke tea` |
| 18 | zuò chē bǎ shū qǔ huí lái
坐车把书取回来
`take the bus to get the books back` | → zuò chē bǎ shū qǔ huí lái
坐书把车取回来
`take the books
to get the bus back` |
| 19 | běi líng dōng mén 北陵东门
`the east gate of Northern Park` | → dōng líng běi mén 东陵北门
`the north gate of Eastern Park` |

Structural errors

- | | | |
|----|--|--|
| 1 | huà dōu búhuì shuō le 话都不会说了
'cannot speak properly' | → *shuō dōu búhuì huà le
说都不会话了 |
| 2 | tā bèi gǒu yǎo le 他被狗咬了
'he was once bitten by a dog' | → *tā bèi yǎo gǒu le
他被咬狗了 |
| 3 | wǒ fèi dōu qì zhà le 我肺都气炸了
'I am so angry that my lungs are exploding' | → *wǒ qì dōu fèi zhà le
我气都肺炸了 |
| 4 | zhè huā shì xiāngde bu 这花是香的不?
'Is this flower fragrant?' | → *zhè xiāng shì huāde bu
这香是花的不? |
| 5 | yuè shì gùxiāng míng 月是故乡明
'The moon is brighter in the hometown' | → *gù shì yuè xiāng míng
故是月乡明 |
| 6 | tā chūle chí fàn jiù shuì jiào 他除了吃饭就睡觉
'all he does is eat and sleep' | → *tā chūle chí jiào jiù shuì fàn
他除了吃觉就睡觉 |
| 7 | zhàn qǐ lái xià dì 站起来下地
'stand up and get to the floor' | → *xià qǐ lái zhàn dì
下起来站地 |
| 8 | nǐ ná lái wǒ jiù chī 你拿来我就吃
'I will eat it if you bring it here' | → *nǐ chī lái wǒ jiù ná
你吃来我就拿 |
| 9 | wǒ kàn tā méi sǐ 我看它没死
'I saw that it did not die' | → wǒ méi kàn tā sǐ 我没看它死
'I did not see it die' |
| 10 | sūnzi zhèngshì shàngxué 孙子正式上学
'my grandson formally goes to school' | → sūnzi shàng zhèngshì xué
'... .. goes to formal school' |
| 11 | yǒu tā yì fēng xìn 有她一封信
'there is a letter for her' | → *yǒu yì tā fēng xìn
有一她封信 |
| 12 | wǒ jīng shòu bú zhù kǎoyàn 我经受不住考验
'I can't stand the test' | → *wǒ jīng bú shòu zhù kǎoyàn
我经不受住考验 |
| 13 | nǐ chī fàn le ma? 你吃饭了吗?
'did you eat your meal?' | → *fàn chī fàn le ma?
饭吃饭了吗? |
| 14 | gēnjù shénme xiě? 根据什么写?
'According to what do you write?' | → *gēnjù xiě shénme?
根据写什么? |
| 15 | wèi shénme yào zhème duō?
为什么要这么多?
'Why do you want this much?' | → *wèi shénme yào zhème
duō gàn shénme?
为什么要这么多干什么? |
| 16 | wǒ dēngjì le 我登记了
'I have registered' | → *wǒ bǎ jì dēng le
我把记登了 |
| 17 | nǐ zhī bù zhīdào 你知不知道
'do you know or not' | → *nǐ zhī bù bù zhīdào
你知不不知道 |

- 18 wǒ qù kànkān 我去看看
'I go and have a look'
→ *wǒ qù kànkān kànkān
我去看看看看
- 19 wǒ bù zhīdào gāi bì bù gāi bì
我不知道该闭不该闭
'I don't know if I should turn it off'
→ *wǒ bù zhīdào gāi bù bù gāi bì
我不知道该不不该闭
- 20 chī bù chī lí? 吃不吃梨?
'do you want to eat a pear?'
→ *chī lí bù lí? 吃梨不梨?
- 21 nǐ de chēkuāng sǎn le 你的车筐散了
'your bike basket is falling apart'
→ * nǐ de chē sǎn le kuāng
你的车散了筐
- 22 bù zhīdào tā néng bùnéng lái.
不知道她能不能来.
'I don't know if she will come'
→ * bù zhīdào tā néng bùnéng lái
háishì bù lái
不知道她能不能来还是不来.

Lexical word omission

1. qì dōu bù dǎ yí chù lái 气都不打一处来
'anger comes from all over me'
→ *qì dōu bù dǎ lái 气都不打来
2. wǒ fā le yí ge xīng qī de shāo
我发了一个星期的烧
'I had a fever for a week'
→ *wǒ fā le yí ge shāo
我发了一个烧
- 3 yǒu shì qǐng dǎ diàn huà zhǎo wǒ
有事请打电话找我
'please call me if you need me'
→ *yǒu shì qǐng dǎ wǒ
有事请打我
'please beat me if you need me'
4. tā hái zǐ gēn wǒ hái zǐ yì bān dà
他孩子跟我孩子一般大
'his child is as old as mine'
→ tā hái zǐ gēn wǒ yì bān dà
他孩子跟我一般大
'his child is as old as I am'
5. nǐ shì bú shì yào zhuāng yú cì hé jī gǔ tóu de pán zi?
你是不是要装鱼刺和鸡骨头的盘子?
'do you want a plate for fish bones and
chicken bones?'
→ nǐ shì bú shì yào yú cì hé jī gǔ tóu?
你是不是要鱼刺和鸡骨头?
'do you want fish bones and
chicken bones?'
- 6 gōng bù lí pó, chèn bù lí tuó
公不离婆, 秤不离砣
'a husband can't be without a wife as a scale
can't be without sliding weight'
→ *gōng bù lí tuó
公不离砣
'a husband can't be without a
sliding weight'
- 8 gāi yǒu nǐ de shí hou méi yǒu nǐ
该有你的时候没有你
'we can't find you when we should have you'
→ *yǒu nǐ de shí hou méi yǒu nǐ
有你的时候没有你
'..... when we have you'

Semantic Errors*Competing words with similar semantic features*

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|----|---|---|---|
| 1 | lè de zuǐ dōu bì bú shàng le
乐得嘴都闭不上了 '(he) laughed so much
that he couldn't close his mouth' | → | lè de yá dōu bì bú shàng le
乐得牙都闭不上了
'.....he couldn't close his teeth' |
| 2 | yǒu yǐzi, gàn má zuò dì shàng
有椅子, 干吗坐地上
'there are chairs, why sit on the floor?' | → | yǒu zhuōzi, gàn má zuò dì shàng
有桌子, 干吗坐地上
'there are tables,?' |
| 3 | bǎ niú nǎi fàng jìn bīng xiāng lǐ
把牛奶放进冰箱里
'put the milk into the fridge' | → | bǎ niú nǎi fàng jìn kǎo xiāng lǐ
把牛奶放进烤箱里
'put the milk into the oven' |
| 4 | huā kāi de duō piào liàng
花开得多漂亮 'what beautiful flowers' | → | shù kāi de duō piào liàng
树开得... '... beautiful trees' |
| 5 | kàn bào zhǐ 看报纸
'read news paper' | → | kàn diàn shì 看电视
'watch TV' |
| 6 | wǒ de diàn nǎo 我的电脑
'my computer' | → | wǒ de diàn shì 我的电视
'my TV set' |
| 7 | qǔ zhào piàn 取照片
'to get pictures' | → | xǐ zhào piàn 洗照片
'to print pictures' |
| 8 | yì qǐ tuì tuō 一起退托
'quit from kindergarten together' | → | yì qǐ tuì xiū 一起退休
'retire together' |
| 9 | qún zhòng de yǎn jīng shì liàng de
群众的眼睛是亮的 'people's eyes are bright' | → | qún zhòng de yǎn jīng shì dà de
... 是大的 '..... are big' |
| 10 | xié chéng jīng pǐn wū 鞋城精品屋
'exquisite shoe shop' | → | ... shí pǐn wū ... 食品屋
'...food shop' |
| 11 | hē bēi chá, chī liǎng kuài bǐng gān
喝杯茶, 吃两块饼干.
'have a cup of tea and two pieces of cookies' | → | hē bēi chá, chī liǎng kuài kā fēi
喝杯茶, 吃两块咖啡
'... and two pieces of coffee' |
| 12 | běijīng rén zài niǔ yuē
北京人在纽约
'a Beijing native in New York' | → | měiguó rén zài niǔ yuē
美国人在纽约
'an American in New York' |
| 13 | shuǐ hē duō le wǎn shàng zǒng shàng cè suǒ
水喝多了晚上总上厕所
'you'll go to washroom a lot if you drink too
much water at night' | → | wǎn shàng zǒng shuì jiào
水喝多了晚上总睡觉
'you'll sleep a lot if you drink
too much water at night' |
| 14 | dǎ ge zhāo huà zài zǒu
打个招呼再走
'say goodbye before you leave' | → | dǎ ge diàn huà zài zǒu
打个电话再走 'make a phone
call before you leave' |

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|----|--|---|
| 15 | wàn jīn 万金
'ten thousand gold' | → wàn liǎng 万两
'ten thousand ounces' |
| 16 | liù hé bīngqílin 六盒冰淇淋
'six boxes of ice-cream' | → liù kuài bīngqílin 六块冰淇淋
'six pieces of ice-cream' |
| 17 | bì zhe yǎn 闭着眼
'with eyes shut' | → bì zhe zǔi 闭着嘴
'with mouth shut' |
| 18 | guā zǐ 瓜子 'sunflower seeds' | → huā shēng 花生 'peanuts' |
| 19 | dāng dài 当代 'contemporary' | → dāng shí 当时 'at that time' |
| 20 | qīzi 妻子 'wife' | → zhàngfu 丈夫 'husband' |
| 21 | sui yuè fēishì 岁月飞逝
'time flies' | → suì shù fēishì 岁数飞逝
'age flies' |
| 22 | chū xiàn 出现 'to appear' | → chū shēng 出生 'to be born' |
| 23 | biàn liàng 变量 'variable' | → biàn tài 变态 'metamorphosis' |
| 24 | bǎ háizi dài lái 把孩子带来
'bring the child here' | → bǎ háizi ná lái 把孩子拿来
'grasp the child here' |
| 25 | bǎ bèi gài shàng 把被盖上
'pull over the quilts' | → bǎ yīfu gài shàng 把衣服盖上
'pull over the clothes' |
| 26 | méi yǒu jià rì 没有假日
'there is no holiday' | → méi yǒu xià tiān 没有夏天
'there is no summer' |
| 27 | miàn bāo 面包 'bread' | → miàn tiáo 面条 'noodle' |
| 28 | xīní dàxué 悉尼大学
'Sydney University' | → mò'ěrběn dàxué 墨尔本大学
'Melbourne University' |
| 29 | yángcōng 洋葱 'onions' | → làjiāo 辣椒 'hot peppers' |
| 30 | xǐyījī 洗衣机 'washing machine' | → bīng xiāng 冰箱 'refrigerator' |
| 31 | xǐyījī 洗衣机
'washing machine' | → féngrenjī 缝纫机
'sewing machine' |
| 32 | hōng gānjī 烘干机 'dryer' | → kǎoxiāng 烤箱 'oven' |
| 33 | yóujú 邮局 'post office' | → yínháng 银行 'bank' |
| 34 | ná bào zhǐ 拿报纸
'get the news paper' | → ná xīnwén 拿新闻
'get the news' |
| 35 | dàn jì 淡季 'dull season' | → màn jì 慢季 'slow season' |
| 36 | zàngzú gūniang 藏族姑娘
'Tibetan girls' | → zàngzú wǔdǎo 藏族舞蹈
'Tibetan dance' |
| 37 | gěinǐ mùshu 给你木梳
'here is the comb' | → gěinǐ tóufa 给你头发
'here is the hair' |
| 38 | shàngbān 上班 'go to work' | → shàngxué 上学 'go to school' |
| 39 | měiguó qiānzhèng 美国签证
'U.S. visa' | → měiguó hùzhào 美国护照
'U.S. passport' |

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|----|---|---|
| 40 | diànshì jià 电视架 'TV stand' | → diànshì tái 电视台 'TV station' |
| 41 | zhíwùrén 植物人 'a patient in a vegetative state' | → jīqìrén 机器人 'a robot' |
| 42 | shuǐ kāile 水开了
'water is boiling' | → huǒ kāile 火开了
'fire is boiling' |
| 43 | shǎo chī xiān de 少吃咸的
'do not eat much salty food' | → shǎo chī yán de 少吃盐的
'do not eat much salt' |
| 44 | ròu pí 肉皮
'pork skin' | → yóu pí 油皮
'oily skin' |
| 45 | jīdàn shì xiān de 鸡蛋是鲜的
'the egg is fresh' | → jīdàn shì shēng de 鸡蛋是生的
'the egg is raw' |
| 46 | xǐhuān tīng xīn xiān gē 喜欢听新鲜歌
'like to listen to new songs' | → ... chī xīn xiān gē ...吃新鲜歌
'like to eat fresh songs' |
| 47 | bǎ huǒ bì le 把火闭了
'turn off the stove' | → bǎ shuǐ bì le 把水闭了
'turn off the water' |
| 48 | huáng guā cài 黄瓜菜
'cucumber salad' | → liáng guā cài 凉瓜菜
'cool melon salad' |
| 49 | huàn lúzi 换炉子
'change the stove' | → huàn guō 换锅
'change the wok' |
| 50 | shàng jiè ào yùn huì 上届奥运会
'last Olympic Games' | → qù nián ào yùn huì 去年奥运会
'last year's Olympic Games' |
| 51 | sān shí jiǔ ge xīngqī 三十九个星期
'thirty-nine weeks' | → sān shí jiǔ ge yuè 三十九个月
'thirty-nine months' |
| 52 | qù nián 去年 'last year' | → *zuó nián 昨年 'yesteryear' |
| 53 | fàng kǎoxiāng li rèrè
放烤箱里热热
'heat it up in the oven' | → fàng kǎoxiāng li rèrè
放冰箱里热热
'heat it up in the refrigerator' |

Semantic chains

- 1 wǒ xiǎng mǎi jiāojiǎn — lùxiàngjī — lùyīnjī — lùyīndài
我想买胶卷 — 录相机 — 录音机 — 录音带
'I want to buy a film — a video camera — a tape recorder — a cassette tape.'
- 2 nǐ qíchē — zuòchē — kāichē qù ma?
你骑车 — 坐车 — 开车去吗?
'Do you go there by bike...by bus...by car?'
- 3 zánmen zǒu guòqù — qí guòqù — kāi guòqù
咱们走过去 — 骑过去 — 开过去
'let's walk — bike — drive there'

- 4 nà jiǎo jiǎo dǐr — xié genr — xié dǐ
那叫脚底儿 — 鞋跟儿 — 鞋底
'it's called the sole of foot — the shoe heel — the shoe sole'
- 5 shuǐ hái méi shāo — méi kāi — méi guàn ne
水还没烧 — 没开 — 没灌呢
'the water is not yet heated — boiled — poured into the thermos'

Competing words with antonymic features

- | | | | |
|----|---|---|---|
| 1 | zuì wēixiǎn 最危险 'most dangerous' | → | zuì ānquán 最安全 'most safe' |
| 2 | tài lěng le 太冷了 'too cold' | → | tài rè le 太热了 'too hot' |
| 3 | chuān shǎo le 穿少了
'wear too little' | → | chuān duō le 穿多了
'wear too much' |
| 4 | dì èr gāo 第二高
'the second tallest' | → | dì èr aī 第二矮
'the second shortest' |
| 5 | wénwén jiù xiāng le 闻闻就香了
'it is fragrant when you smell it' | → | wénwén jiù chòu le 闻闻就臭了
'it stinks when you smell it' |
| 6 | zhème diǎnr rén 这么点儿人
'so few people' | → | zhème duō rén 这么多人
'so many people' |
| 7 | bù shǎo ba 不少吧 'not too few' | → | bùduō ba 不多吧 'not too many' |
| 8 | bú gòu cháng 不够长
'not long enough' | → | bú gòu duǎn 不够短
'not short enough' |
| 9 | xià bān zhème wǎn 下班这么晚
'off work so late' | → | xià bān zhème zǎo 下班这么早
'off work so early' |
| 10 | bú xià hu tā 不吓唬它
'do not frighten it' | → | bú hàipà tā 不害怕它
'do not be afraid of it' |
| 11 | kuài guān mén 快关门
'close the door quickly' | → | kuài kāi — kuài guān mén 快开门
'shut the door quickly' |
| 12 | zhǐnéng jiě jué bùfēn wèntí
只能解决部分问题
'can only partially solve the problem' | → | bùnéng bùfēn jiějué wèntí
不能解决部分问题 'cannot
partially solve the problem' |
| 13 | bù jīng cháng 不经常
'not often' | → | bù ǒu ěr 不偶尔
'not occasionally' |
| 14 | bú yào nǐ zǎo zǒu 不要你早走
'(I) won't let you go early' | → | bú yào nǐ wǎn zǒu 不要你晚走
'(I) won't let you go late' |
| 15 | zhīshi qiǎnbó 知识浅薄
'limited knowledge' | → | zhīshi yuānbó 知识渊博
'profound knowledge' |
| 16 | jià qián zhǎng le 价钱涨了
'the price has gone up' | → | jià qián jiàng le 价钱降了
'the price has dropped' |

- 17 tā bù shōu huànzhě 他不收患者
‘he (the doctor) doesn’t take patients’ → tā bù shōu dàifu 他不收大夫
‘he doesn’t take doctors’
- 18 túshūguǎn jǐdiǎn guānmén 图书馆几点关门
‘what time does the library close?’ → — jǐdiǎn kāimén — 几点开门
‘when does the library open?’

Contamination errors

- 1 qiē niú ròu 切牛肉
‘cut beef’ → qiē zhīma 切芝麻
‘cut sesame’ (putting sesame on the beef)
- 2 yǒu wén jiàn yào yìn ma
有文件要印吗
‘have files to print?’ → yǒu wén jiàn yào rè ma
有文件要热吗
‘have files to heat up?’ (just heated up lunch)
- 3 fēng hǎo dà 风好大
‘it’s too windy’ → chē hǎodà 车好大 ‘such a big bike’
(heard a bike falling in the wind)
- 4 nǐ xǐ kuàizi le ma 你洗筷子了吗
‘did you wash chopsticks?’ → nǐ chī kuàizi le ma 你吃筷子了吗
‘did you eat chopsticks?’ (when about to eat)
- 5 nǐ méi xǐ shǒu 你没洗手
‘you did not wash hand’ → nǐ méi chī shǒu 你没吃手 ‘you did not eat hand’
(washing hand for dinner)
- 6 bǎ bǐng nā guò qù 把饼拿过去
‘take the cake there’ → bǎ tāng nā guò qù 把汤拿过去
‘take the soup there’ (while making soup)
- 7 chē kuāng zhēn dà 车筐真大
‘what a big bike basket’ → shū bāo zhēn dà 书包真大 ‘what a big school
bag’ (putting a school bag into the bike basket)
- 8 xiě zuò yè 写作业
‘write homework’ → kàn zuò yè 看作业
‘watch homework’ (watching TV)
- 9 zhēn bú cuò, jiē zhe hē
真不错, 接着喝
‘really good, drink more’ → zhēn bú cuò, jiē zhe tāng 真不错, 接着汤
‘really good, soup more’
(while watching the addressee drinking soup)
- 10 nǐ yào kàn ma? 你要看吗
‘do you want to watch it (TV)’ → nǐ yào chī ma? 你要吃吗
‘do you want to eat it?’ (putting a cake in fridge)
- 11 zhè hái zi pàng le 这孩子胖了
‘this child has become fatter’ → zhè hái zi pìgu 这孩子屁股 ‘this child’s buttocks’
(looking at the buttocks of the child)
- 12 kāi diàn le ma? 开店了吗
‘is the (flower) shop open?’ → kāi huā le ma? 开花了吗
‘is the flower blossoming?’ (at a flower shop)
- 13 mǎi pí dài 买皮带
‘to buy a trouser belt’ → mǎi yào shì 买钥匙 ‘to buy a key’
(looking at the key-ring on the belt)

- 14 kuài bǎ ěrhuán nǎ xià lai → kuài bǎ ěrduo nǎ xià lai 快把耳朵拿下来
快把耳环拿下来 'take your ears off quickly' (when a baby boy
'take your earrings off quickly' is pulling the addressee's earrings)
- 15 dài ge píngguǒ shàng tuō'ersuǒ chī → ... shàng cèsuǒ chī ... 上厕所吃
带个苹果上托儿所吃 'take an '... to eat in the washroom'
apple to eat at the daycare' (speaking as walking towards the washroom)
- 16 zhù fáng zhìdù gǎigé le → zhù yuàn zhìdù gǎigé le 住院制度改革了
住房制度改革了 'the hospitalization system has changed'
'the housing system has changed' (speaking at a hospital admission office)
- 17 A: nǐ yào cù ma? 你要醋吗 B: yào 要 → cù 醋
'do you want vinegar?' 'yes' 'vinegar' (taking over the vinegar)
- 18 A: hái hē tāng ma? 还喝汤吗 B: hē 喝 → tāng 汤
'would you have more soup?' 'yes' 'soup' (looking at the soup pot)
- 19 A: māo chī páng xiè ma? B: nǐ shìshi tā → nǐ wèn wèn tā
猫吃螃蟹吗 你试试它 你问问它
'does the cat eat crab?' 'you try it' 'you ask it' (looking at the cat)

Logo-phonographic Errors

- 1 chǔn chǔn yù dòng 蠢蠢欲动 → chóng (虫) chǒng yù dòng
'ready to make trouble'
- 2 lín cì zhì bǐ 鳞次栉比 → lín cì jié (节) bǐ
'arranged row after row'
- 3 hěn yòu rén 很诱人 → hěn xiù (秀) rén
'very attractive'
- 4 bǎ tā jiū chū lái 把他揪出来 → bǎ tā qiū (秋) chū lái
'pull it out'
- 5 fēng chí diàn chè 风驰电掣 → fēng chí diàn zhì (制)
'as swift as wind and lightning'
- 6 jīng jīng yè yè 兢兢业业 → kē (克) kē yè yè
'cautious and conscientious'
- 7 shuān yáng ròu 涮羊肉 → shuā (刷) yáng ròu
'hot pot lamb'
- 8 qiè yì 惬意 → xiá (峡) yì
'pleasant'
- 9 shè yǐng 摄影 → niè (聂) yǐng
'photography'
- 10 jí shǒu 棘手 → là (辣) shǒu
'difficult to handle'

- 11 xiāng cūn bié shù 乡村别墅 → xiāng cūn bié yě (野)
 'a villa in the countryside'
- 12 jīng cháng dài xiāo — zhì xiāo 经常带销 — 滞销
 'the sale is often stagnant'
- 13 tā jīng cháng xiōng — xù jiǔ 他经常凶 — 酗酒
 'he often gets drunk'
- 14 zhōngyú lù chū pò dìng — pò zhàn 终于露出破绽 — 破绽
 '(he) finally showed (his) flaws'
- 15 shēnchuān shì — shēnzhèn shì 深川市 — 深圳市
 'Shenzhen City'

Speech errors of bilingual type:

Phonological mixings

- 1 mǎi sān ge 买三个 → bǎi sān ge buy
 'buy three'
- 2 fàng de tài duō 放得太多 → pù de tài duō put
 'put too much'
- 3 tā yǒu yì zhāng yuán liǎn 她有一张圆脸 → ... ruáng liǎn round
 'she has a round face'
- 4 qù tài guó 去泰国 → qù tài lán Thailand
 'go to Thailand'
- 5 niú nǎi shì wēn de 牛奶是温的 → niú nǎi shì wō de warm
 'the milk is warm'
- 6 kàn zhè ge shū 看这个书 → kàn zhè ge bǔ book
 'read this book'
- 7 zhè ge gǒu ... 这个狗 → zhè ge dǒu ... dog
 'this dog' ...
- 8 bié xiǎng dǐ lài 别想抵赖 → bié xiǎng dǐ nài deny
 'don't try to deny'
- 9 nǐ zǒu bù zǒu 你走不走 → nǐ gǒu bù gǒu go
 'you go or not go'
- 10 tā méi zhǔnr néng lái 他没准儿能来 → tā méi bǐ néng lái maybe
 'Maybe he can come.'
- 11 míng tiān shì qíng rén jié 明天是情人节 → míng tiān shì qíng rén déi day
 'tomorrow is Valentine's Day'
- 12 nà dōngxi tài zāng, bù néng pèng → ... bù néng tòng touch
 那东西太脏, 不能碰 'that thing is too dirty, don't touch'

13	zhè xiē kěyǐ zuò 这些可以做 'these can be <u>done</u>	→	zhè xiē kěyǐ duò	do	
14	bǎ wénjiàn lā guò lái 把文件拉过来 ' <u>drag</u> the file over here'	→	bǎ wénjiàn zhài guò lái	drag	
15	qù xīn jiā pō 新加坡 'go to <u>Singapore</u> '	→	qù xīn jiā gā	Singapore	
16	wǒ ná bú zhù 我拿不住 'I can't <u>hold</u> it'	→	wǒ hóu bú zhù	hold	
17	nǐ kěn dìng ma 你肯定吗 'are you <u>sure</u> ?'	→	nǐ kěn shuò ma	sure	
18	xiě yì piān 写一篇 'write one <u>page</u> '	→	xiě yì pēi	page	
19	A: nǐ qù ma? 你去吗 'are you going'	B: bú qù 不去 'no'	→	nóu qù	no

Lexical transformation

1	tǔ dòu tāng 土豆汤 'potato soup'	→	xī hóng shì tāng 西红柿汤 'tomato soup'
2	The paper is a hundred pages	→	... a hundred *years (页儿)
3	Would you have some more shrimp?	→	... some <u>more</u> *xia (毛虾)?

Syntactical mixture

1	wo kai che song ni qu xue xiao 我开车送你去学校 'I will drive you to school'	→	*wo kai ni qu xue xiao. 我开你去学校
2	wo bing de hen li hai 我病得很厉害 'I am very sick'	→	*wo hen bing. 我很病

Address term and social-cultural errors

1	tā de gōng gōng 她的公公 'her father-in-law'	→	tā de yuè fù 她的岳父
2	nǐ gēgē bǐ nǐ dà jǐ suì? 你哥哥比你大几岁? 'how much older than you is your (old) brother?'	→	nǐ dìdì bǐ nǐ dà jǐ suì? 你弟弟比你大几岁? 'how much older than you is your (younger) brother?'

- 3 tā de sāozi — xiǎogū hěn piàoliàng
她的嫂子 — 小姑很漂亮 'her sister-in-law is pretty'
- 4 kuài jiào shūshu — dàda
快叫叔叔 — 大大 'quick, say hello to your uncle'
- 5 tāmen shì biǎo — táng xiōngdì
他们是表 — 堂兄弟 'they are cousins'
- 6 Ma dàifu — Ma zhǔrèn 马大夫 — 马主任
Doctor Ma — Director Ma
- 7 Ouyang lǎo(shī) — Ouyang jiàoshòu 欧阳老(师) — 欧阳教授
Tea(cher) — Professor Ouyang
- 8 Xiǎohu tā mā — e — Dahu tā mā? 小虎他妈 — 呃 — 大虎他妈?
'Xiaohu's mother — eh — Dahu's mother?'
- 9 wǒmende jīnglǐ — wǒmende zǒng jīnglǐ 我们的经理 — 我们的总经理
'our manager — our president'
- 10 zānmen gē jǐge hē — zānmen yé jǐge hē 咱们哥几个喝 — 咱们爷几个喝
'let's drink, brothers — guys of different generations'

Intended errors for extra-linguistic purposes

- 1 tā xiàng ge liúmáng — mángliú 他象个流氓 — 盲流
'He is like a rascal — a wanderer'
- 2 nǐ tài shǎ le — nǐ tài xiāosǎ le 你太傻了 — 你太潇洒了
'You are very stupid — very elegant'
- 3 cǎi mógu de xiǎo gūniang bēi zhe yí ge dà luókuāng → bēi zhe yí ge dà gūniang
采蘑菇的小姑娘, 背着一个大箩筐 背着一个大姑娘
'Picking mushroom, the little girl is carrying a big basket' '..... is carrying a big girl'

Unintended non-errors

- 1 jiànkāng 健康 → kāngjiàn 健康
'strong and healthy',
- 2 jiǎngyǎn 讲演 → yǎnjiǎng 演讲
'to give a public speech',
- 3 tiānfāndì fù 天翻地覆 → dìfùtiānfān 地覆天翻
'heaven and earth turning upside down',
- 4 rúzuì rúchī 如醉如痴 → rúchī rúzuì 如痴如醉
'like crazy like drunk, obsessed'

- 5 ěr mù yì xīn 耳目一新 → yì xīn ěr mù 一新耳目
'find everything new and fresh'
- 6 wàn zǐ qiān hóng 万紫千红 → qiān hóng wàn zǐ 千红万紫
'a riot of color'
- 7 nǎo mǎn cháng féi 脑满肠肥 → cháng féi nǎo mǎn 肠肥脑满
'heavy-jowled and potbellied'

Miscellaneous

- 1 zhèshì gāozhī lóu 这是高知楼 → zhèshì gāojǐ lóu 这是高几楼
'this is the building for high-ranking intellectuals'
- 2 zánmen kāi huái chàng yǐn 咱们开怀畅饮 → chàng yǐn tòng gān 畅饮痛干
'let's drink to our heart's content'
- 3 fàn cài tài fēng shèng 饭菜太丰盛 → fàn cài tài fēng yàn 饭菜太丰宴
'this banquet is so sumptuous'
- 4 wǒ shì yè dà bìyè de 我是夜大毕业的 → wǒ shì bì dà de 我是毕大的
'I graduated from night university'
- 5 zài fàndiàn lǐ zuò zhe chī fàn → zuò fàndiàn lǐ zhàn zhe chī fàn
在饭店里坐着吃饭 坐饭店里站着吃饭
'to sit in a restaurant dining'
- 6 chīfàn shí nǐ dào nǎ qù le 吃饭时你到哪去了? → nǐ dào nǎ chīfàn qù le 你到哪吃饭去了?
'where were you at dinner time?' 'where did you have dinner?'
- 7 huí guò tóu lái xiǎng xiǎng → huí guò lái tóu xiǎng xiǎng
回过头来想想 回过头来想想
'look back to think of the past' 'turn back head to think of the past'
- 8 nǐ xià cì lái zìxì dì suàn yí xià → nǐ xià cì zìxì dì lái yí xià
你下次来仔细地算一下 你下次仔细地来一下
'calculate carefully next time you come' 'come carefully next time'
- 9 lún bān, yìjiā yìtiān yíyè 轮班, 一家一天一夜 → yìtiān yìjiā yíyè 一天一家一夜
'by shift, one day and one night per family' '..... one night per family everyday'
- 10 jiǎo wǎng liǎng biān shēn 脚往两边伸 → yì zhī jiǎo shēn liǎng tiáo tuǐ
'stretch your feet to both sides' 脚一只伸两条腿
- 11 nǐ yá zěnmē le? zhāng zuǐ! → nǐ yá zěnmē le? tái jiǎo!
你牙怎么了? 张嘴! 'What happened to your teeth? Open your mouth!' 你牙怎么了? 抬脚! 'What happened to your teeth? Lift your foot!'
- 12 tā bǐ wǒ dà yì lún duō yí suì → tā bǐ wǒ dà yì lún duō yí quān
他比我大一轮多一岁 'He is a dozen and one years older than me.' 他比我大一轮多一圈 'He is a dozen and one cycle years older than me.'

- 13 nǐ xiǎo shíhou nǐ mā dǎ guò nǐ ma? → nǐ mā xiǎo shíhou dǎ guò nǐ ma?
你小时候你妈打过你吗 'Did your mother
hit you when you were small?' 你妈小时候打过你吗 'Did your
mother hit you when she was small?'
- 14 bié bǎ tāng sǎ zài xié hē yīfú shàng → bié bǎ xié sǎ zài yīfú shàng
别把汤洒在鞋和衣服上 别把鞋洒在衣服上
'Don't spill the soup on your shoes and clothes'
- 15 yòu chū dòng zhème xiē rén 又出动这么些人 → yòu chū zhème xiē dòng 又出这么些动
'We gathered so many people again to go out'
- 16 zhàopiān bǐ tā běn rén niánqīng hǎojǐ suì → zhàopiān bǐ tā běn rén piányi hǎojǐ suì
照片比她本人年轻好几岁 'She looks
many years younger in her picture' 照片比她本人便宜好几岁 'She looks
many years cheaper in her picture'
- 17 guāng shù kǒu bù shuā yá 光漱口不刷牙 → guāng shù zǔi bú shù kǒu
'rinse mouth only, not brush teeth' 光漱嘴不漱口
- 18 wǒ bǎ zhuōzi fàng hǎo le 我把桌子放好了 → wǒ bǎ chuáng pū hǎo le 我把床铺好了
'I have laid the table' 'I have made the bed'
- 19 nǐ lí diàn shì tài jìn 你离电视太近 → nǐ lí diàn shì tài dà 你离电视太大
'you are too close to the TV' 'you are too big to the TV'
- 20 tā bǎ là zhú diǎn zhāo le 他把蜡烛点着了 → tā bǎ là zhú dǎ kāi le 他把蜡烛打开了
'he lit up the candle' 'he turned on the candle'