Slips of the Tongue and Pen in Chinese

by
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1.   Introduction

In the West there is a rather extensive literature on the psycholinguistic implications of errors in speech and writing. Psychologists and linguists such as Victoria Fromkin, Charles Hockett, Gary Dell, David Fay, Anne Cutler, Donald MacKay, and others have for many years been classifying and analyzing various linguistic errors in English and other Western languages, and the study of errors now constitutes a rather lively domain which is shedding new light on the various cognitive processes involved in speech and writing.

Psychologists and linguists have known for some time that slips of the tongue can provide enlightening glimpses into the mechanisms of language. By studying such errors, much can be learned about the mind without undertaking any formal experiments. And one advantage of using mistakes as one's window onto the mechanisms of language and thought is that there is an inexhaustible supply of fresh new data being produced every day. Speech errors of all kinds swarm in our linguistic environment like hordes of variegated insects waiting to be caught, labeled, and categorized.

It is a pity, then, that so far there have been so few dedicated Chinese "entomologists" who have undertaken to collect and analyze these linguistic "insects". The linguist Zhao Yuanren was someone who recognized the instructive value of linguistic errors, and his writings are filled with fascinating examples of grammatical anomalies and revelatory slips of the tongue. But to my knowledge, virtually no systematic psycholinguistic research on errors has been done in Chinese.

Speech errors occur in all languages, of course, but until now by far the bulk of speech-error research has been done in English. To my knowledge, only two studies have been done on speech errors in non-Indo-european languages (namely, Arabic and Thai; see Abd-el-Jawad & Abu-Salim, 1987 and Gandour, 1977). I have made a very modest start at collecting and analyzing errors in Chinese that have fairly clear or even

exact counterpart categories in English, and the first part of this paper deals with these examples. It would be perhaps even more instructive to discover and classify errors that are specific to Chinese and that have no clear counterparts in English or other Western languages. What is needed is a large corpus of Chinese linguistic errors for more systematic study. Hopefully, careful analysis of such a corpus would raise some new issues as well as further validate some theories of error-making that have become mainstream over the past couple of decades.

1.1. What the study of errors can tell us

A full discussion of the linguistic and cognitive-science implications of error-making is beyond the scope of this paper, but the following are just a few of the kinds of questions the study of errors can shed light on:

• Speech errors have been used to explore the nature of the mental lexicon. How are words and phrases stored and retrieved in the mind? To what extent are they linked by semantic associations and to what extent by phonetic or grammatical aspects? Error researchers routinely use evidence from linguistic phenomena such as malapropisms (e.g., Fay & Cutler, 1977) to deduce facts about the mental lexicon. One of the most important current models of lexical storage and retrieval involves the notion of "spreading activation", and several researchers studying speech errors have begun to develop theories based on this mechanism (e.g., Dell, 1986). (For a brief discussion of the notion of spreading activation and its implications for speech errors, see Hofstadter & Moser, 1989.)

• Speech errors have been useful in the construction of performance models. How do the various low-level and high-level language processes interact in the flow of speech? To what extent are the higher-level semantic and syntactic processes and the lower-level phonetic and articulatory processes independent? Fromkin (1973, 1980), Dell & Reich (1980, 1981), Garrett (1980) and others have used evidence from speech errors to construct models of speech production. Nooteboom (1980), Motley & Baars (1975), and other error researchers have used phenomena observed in errors to argue for the existence of phonological, syntactic, and semantic editing mechanisms in the process of speech production.

• Written errors can provide windows onto the planning processes involved in writing and can also provide clues to the mechanisms involved in reading. How important a role does phonetic recoding play in the

process of reading and writing?   To what degree is Chinese different from alphabetic languages such as English in this respect?   What implications do the various differences between alphabetic writing systems and Chinese script have for written language acquisition, reading ability, and semantic processing of text?   These issues have been dealt with at some length by DeFrancis (1984, 1989), Tzeng & Hung (1981) and Tzeng, Hung & Wang (1977).   Chu-Chang & Loritz (1977) used errors on a short-term memory lexical-recall task to infer that native Chinese readers process characters phonetically.   At least one study of experimentally induced slips of the pen in Japanese (involving Kanji characters) addresses some of these issues, as well (Nihei, 1986).

• Cognitive scientists are also interested in error-making because errors can reveal much about how people form concepts and categories, how they make analogies and judgments, and how the mind interprets and makes sense of the world.   Such error research is by no means limited to speech errors, of course.   Psychologist Donald Norman (Norman, 1981, 1988) has studied various kinds of high-level "action slips" and their implications for perception and cognition.   Speech errors are interesting to researchers in language and cognition because in error-free speech and writing the various processes that go into language production are often hidden; it is only when a tell-tale error crops up that all the competing and interacting forces reveal themselves, just as when a magic trick goes wrong the techniques of the magician are revealed to the audience.

2. Speech errors (口 误)

A basic distinction between types of errors in English is one that is made in Chinese, too; that is, the basic difference between a written error (笔 误) and a spoken error (口 误).   I will here deal with these two classifications separately, although, as will be shown, many of the same kinds of errors appear in both modalities.

The following categories represent merely a sampling of some of the standard kinds of errors that linguists have noticed and studied for many decades, along with several equivalent or related examples from my small corpus of Chinese errors.   The Chinese examples were collected by me over the course of a year or so, and I have had to rely on examples collected by Chinese friends as well as those I collected myself.   My corpus is still far too small (around 150) to be used for any systematic analysis, and thus this paper is as much a call for additional examples as it is a presentation of my own examples.   I have provided tentative Chinese translations for the

various error categories, as I am unaware of any already-existing standardized linguistic error terminology in Chinese.

2.1.   Anticipation errors   （前 置 语 误）

An anticipation error happens when a particularly salient segment about to be uttered *masks* (interferes with or replaces) the segment in the process of being uttered. For example:

Ex. 1. "Tomorrow we can expect partly *skoudy skies... that is, partly cloudy skies."

Here the initial /sk/ consonant cluster at the beginning of "skies" masked the corresponding segment of "cloudy" to produce "skoudy". The masking usually involves initial consonant sounds, but can involve nuclear segments and final segments as well:

Ex. 2. "The *concleesions...   the conclusions reached by the committee..."

Ex. 3. "We can make certain *assunctions... assumptions about this function."

Ex. 4. "The two defendants were *indepentence... independently sentenced."

Ex. 5. "...and for those who really believe we have become a *kindler, gentler nation..."

Anticipation errors are, of course, very common in Chinese as well. The following three examples are rather straightforward ones in which the initial segment of a syllable is masked by the initial segment of a syllable about to be uttered. (The English translations I've provided usually do not attempt to translate the error.):

Ex. 6. "Zhùi... 对, 这 两 个 不 行."
"*Zhùi...dùi, zhèi liǎng ge bù xíng." ("Right, these two are no good.")

The intitial segment /zh/ of "zhèi" (这) masked the initial segment /d/ of "dùi" (对).

Ex. 7. "每 个 小 帐 蓬 里 可 以 suì ... 睡 三 个 人."

"Měige xiǎo zhàngpeng li kěyǐ *sùi...shùi sānge rén." ("Each small tent can sleep three people.")

Here it is likely that the initial /s/ of "sān" (三) interfered with the initial /sh/ of "shùi" (睡).

Ex. 8. "我 是 zhóng ... 我 是 从 中 国 来 的."
"Wǒ shì *zhóng...wǒ shì cóng Zhōngguó lái de." ("I come from China.")

The initial segment /zh/ of "zhōng" (中) was anticipated in the uttering of "cóng" (从). Dell (1984) has noted that repeated sounds in a speech plan are contributory causes of phoneme exchanges, anticipations, and perseverations. (For example, a pair of words with similar vowel sounds such as "mad" and "plan" are more likely to give rise to errors than a pair like "mode" and "plane".) Given that the final in both "zhōng" and "cóng" is the same, this example may be an instance of the phenomenon Dell is talking about. (See also the English examples 3 and 4 above.) On the other hand, in Chinese, the suprasegmental aspect of the syllable (i.e., its tone) must be taken into account in the assessment of similarity — meaning, for example, that two syllables with homophonic finals but differing tones like "zhōng" and "cóng" may not be perceived by a native Chinese in the same way a native English speaker perceives two English words like "wrong" and "song". This would suggest a relatively higher frequency of errors such as the following, in which the masking syllable and the target syllable share the same tone as well as the same final:

Ex. 9. "我 到 了 Xīng 华... 青 华 大 学 是 个 星 期 四."
"Wǒ dàole *Xīnghuá... Qīnghuá Dàxué shìge xīngqī sì." ("I arrived at Qinghua University on a Thursday.")

It seems possible that the initial of "xīng" (星) masked the intial of "qīng" (青), though an alternate explanation would be that the entire syllable, final and all, was anticipated. (It is perhaps impossible in principle to tell the difference.) I have run across a number of such errors, but my collection is still too small to draw any conclusions about the relative frequency of such error types.

In the following example it is not the initial consonant but the vowel that is masked by an anticipated phoneme:

Ex. 10. "我 觉 得 这 三 个 信 息 是 同 时 包 含 在 英 语 的 一 个

xī ... 虚 拟 语 气..."

"Wǒ juéde zhèi sānge xìnxī shì tóngshí bāohán zài Yīngyǔ de yíge *xī... xūnǐ yǔqì..." ("It seems to me that these three bits of information are contained in the English subjunctive...")

It seems likely here that the vowel of "nǐ" (拟) masked the vowel of "xū" (虚), but note that the first tone of the target syllable xū is preserved. The vowel sound of "qì" (气) may have contributed as well.

In the preceding examples, phonemes are masked by anticipated phonemes. In the following example, an entire syllable is clearly replaced by an anticipated syllable:

Ex. 11. "人 就 是 这 么 奇 改... 奇 怪. 改 日 再 谈 吧."
"Rén jiù shi zhème qí*gǎi... qíguài. Gǎi rì zài tán ba." ("People are funny that way. Let's talk about it later.")

The salient word "gǎi" (改) on the processing stack masked the syllable "guài"(怪), no doubt helped by the fact that both syllables start with a /g/ sound. Note here that the masking syllable retains its proper tone rather than the tone of the target syllable (which would have resulted in "qígài"). If this were always the case, it would be evidence that the assignment of tone takes place during the same processing stage as organization of segmentals. But as will be seen in later examples, the tone of the anticipated syllable is not always preserved.

Indeed, one of the first questions that one might ask about such examples is, are the tones of Chinese subject to the same kinds of processing errors as phonemes and segments? One might reasonably assume so, considering that tones play a distinctive phonological role in tonal languages just as do vowels and consonants in all languages. Fromkin (1980) notes that "One interesting aspect of speech error data is that no linguistic unit, structure, or grammatical component seems to be immune[.]" She goes on to cite Gandour (1977), who showed that tones in Thai are anticipated, perseverated, and reversed, just as segments are in English and other languages. The following anticipation errors provide some evidence that the same is true of Chinese:

Ex. 12. "他 可 以 不 要 再 提 yuàn ... 任 何 原 因..."
"Tā kěyǐ búyào zài tí *yuàn... rènhé yuányīn..." ("He doesn't have to give any reason whatsoever.")

Here the segment "yuan" is anticipated totally intact, but carrying the fourth tone of the target syllable "rèn" (任). (Note that, as this example shows, anticipations do not always occur on contiguous syllables. This suggests, as most processing models hypothesize, that speech production is not based upon a simple left-to-right processing of successive elements, but rather involves the processing of syntactic and phonological organizational units in several stages prior to the issuing of low-level motor commands.)

The following is another example of tonal anticipation:

Ex. 13. "从 这 个 地 方 Chāng ... 长 安 街..."
"Cóng zhè ge dìfang *Chāng... Cháng'ānjiē..." ("From here, the Avenue of Heavenly Peace...")

It seems probable here that the first tone of "ān" (安) was anticipated in the uttering of "Cháng" (长).

In the following tonal error, the masking tone comes from a syllable in a word that was active during the lexical decision-making stage, but not present in the final sentence itself:

Ex. 14. "我 们 先 shǎng ... 商 量 吧."
"Wǒmen xiān *shǎng... shāngliàng ba." ("Let's first discuss it.")

According to the speaker's introspective account (to which one must attach the usual caveats), the word "tǎolùn" (讨 论) had been briefly considered in processing, along with the semantically related word "shāngliàng" (商 量), and it can be assumed that the third tone of the syllable "tǎo" masked the syllable "shāng".

In what might be considered even more convincing proof of the independence of tone and segmentals in processing, the following utterance contains what seems to be a stray English syllable with a Mandarin tone affixed to it:

Ex. 15. "好, bye [*clearly uttered with a fourth tone*]... 嗯, 再 见 !"
"Hǎo, bye... uh, zàijiàn!" ("Okay, bye... uh, goodbye!")

The speaker, experiencing interference from English, uttered the first syllable of "bye-bye" (which would normally have an intonational contour something like:

b y e-b y e

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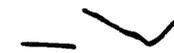
or perhaps:

bye-bye)

using the fourth tone borrowed from the character 再(zài) as in "zàijiàn" 再见 ("goodbye").

One might assume that errors in speech production involving tone would occasionally give rise to tonal hybrids or splices that differ from the usual suprasegmental characteristics of Chinese. However, there is a rather well-accepted principle in the field of errors known as Well's First Law (Wells, 1951) which says that phonemes appearing in speech errors are always consistent with the phonological rules of the language. One almost never finds a phoneme in a slip of the tongue that is not heard in regular utterances. For instance, a spoonerism of "spoon and fork" might result in "foon and spork" but never "fpoon and sork". Similarly, it seems likely that the four tones of Mandarin, having basically the same status as segmental phonemes, can be exchanged, perseverated, anticipated, etc., but would seldom appear in hybrid forms that are not part of the language. My modest corpus of errors contains no counter examples, but it is difficult for me as a non-native speaker to verify this conjecture personally.

Sometimes the anticipation merely phonetically influences the word in question rather than masking it:

Ex. 16. "戈 尔 巴 乔 夫 不 是 苏 联 的 zhǒng 书 记… 总 书 记 吗?"
"Geěrbāqiáofū búshi Sūlián de *zhǒngshūjì… zǒngshūjì ma?" ("Isn't Gorbachev the General Secretary of the Soviet Union?")

The preparation for the initial retroflex consonant of "shū" (书) interfered with the pronunciation of the initial dental sibilant of "zǒng" (总), resulting in the syllable "zhǒng". Such an error probably does not result from any kind of placement error in processing, but rather is a result of much lower-level error in the execution of a motor command after the sentence was already completely formulated.

Garrett (1975) identified four generalizations about speech errors, one of which was that interfering or masking elements tend to come from corresponding or isomorphic locations in the sentence; that is, beginning segments tend to mask other beginning segments, middle segments mask middle segments, etc. Furthermore, if two polysyllabic words are involved

in an anticipation, the interfering syllable(s) tends to mask the corresponding syllable(s) in the target word, as in the following example:

Ex. 17. "His opening night *performous... performance was an enormous success."

"Performance" and "enormous" both have three syllables, and the interference involves last two syllables of each word. Since it is often unclear what constitutes a word in Chinese (indeed, the notion of what constitutes a word in English itself is somewhat murky), it is interesting to look at such generalizations in light of Chinese examples such as the following:

Ex. 18. "反正中国的运动... 像文化大跃... 文化大革命, 大跃进..."

"Fǎnzheng Zhōngguó de yùndòng... xiàng Wénhuà Dàyuè... Wénhuà Dàgémìng, Dàyuèjìn..." ("Anyway, the political movements of China, like the Cultural Revolution, the Great Leap Forward...")

Does this example constitute evidence for or against Garrett's generalization? It depends on how one chooses to break up the sentence into words. If, in the minds of Chinese speakers, "Wénhuà Dàgémìng" ("Great Cultural Revolution") is composed of *two* words (as it is usually written), then the error seems isomorphic to the previous English error. If, however, the phrase is perceived as being composed of *three* words — "wénhuà" ("cultural") + "dà" ("big") + "gémìng" ("revolution") — or if it is it simply one long polysyllabic chunk like "interdisciplinary" or "right-to-lifer", then the implications for Garrett's generalization are somewhat different. The psychological reality of word boundaries is one kind of issue that can perhaps be fruitfully explored through a comparison of the kinds of speech errors Chinese speakers and English speakers make.

2.2. Perseveration errors (延续语误)

A perseveration error is simply the opposite of an anticipation error: some salient segment or syllable just uttered influences or replaces a sound in the process of being uttered. As is the case with anticipation errors, there are many possible masking patterns:

Ex. 19. "That was our English *leshon... lesson for today."

Ex. 20. "I had to leave my car at the Detroit Metro *airpoit."

Ex. 21. "If you think that while you're pregnant you can stay in tip-top *tape... tip-top shape, forget it."

There seems to be general agreement that perseveration errors are less common than anticipations. Researchers such as Nooteboom (1973) and van den Broecke & Goldstein (1980), looking at English, German, and Dutch, have noted this difference in frequency. The latter maintain that anticipations are the more common because the part of the utterance still in the programming stage is more salient than what has already been uttered. Abd-El & Abu-Salim (1987), in contrast, found the frequency of anticipations and perseverations to be almost equal in their corpus of errors in Arabic. Interestingly, Gandour (1977) found that tonal perseveration errors outnumbered tonal anticipation errors by a ratio of about two to one in his collection of speech errors in Thai, and it is not clear whether this represents some idiosyncracy of his corpus or perhaps some aspect of tone itself. Gandour notes that in the tone languages of West Africa, perseverative tone rules (rules that spread tones from left to right) are more common than anticipatory tone rules (rules that spread tones from right to left), and he speculates that this asymmetry might suggest some built-in constraint in the speech mechanism which would also explain the preponderance of tonal perseveration errors. I have been able to collect very few perseveration errors, tonal or otherwise, in Chinese, but this may merely reflect the modest size of my collection, or perhaps some intrinsic difficulty in collecting such errors.

At any rate, the following examples culled from my small collection of perseverations highlight many of the same issues raised by anticipation errors:

Ex. 22. "她 是 一 个 村 gān ... 干 部..."
"Tā shì yíge cūn*gān... gànbù..." ("She's a cadre from the countryside...")

Presumably the first tone of "cūn" (村) was persevered in the syllable "gàn" (干). Note, however, that the character 干 also has a first-tone reading as well (gān). Though the error was uttered in spontaneous conversation, not while reading a text, it is hard to say what kind of a contributing influence such factors may have.

Ex. 23. "这 件 事 很 难 预 料 diào."
"Zhèi jiàn shì hěn nán yùliào *diào." ("This was very hard to predict.")

The target was "yùliào dào" (预料到). The final of the syllable "liào" interfered with the pronouncing of the syllable "dào".

Ex. 24. "春 天 的 时 候, 虫 子 chóng ... 从 冬 眠 的 状 态..."
"Chūntiān de shíhou, chóngzi *chóng... cóng dōngmián de zhuàngtài..." ("In the springtime, the insects, from their hibernative state...")

This is another rather straightforward example of one initial consonant masking another, the interference no doubt helped by phonetic (including tonal) similarity.

Sometimes the influence of the persevered segment merely alters the target segment in some way (as in example15 above) rather than masking it completely:

Ex. 25. "... 老 百 姓 一 行 住 shù (宿)..."
"...lǎobǎixìng yì háng zhù*shù (sù)..." ("...the common people were in a section of dwelling places...")

The initial retroflex stop of "z h ù" (住) was perseverated in the pronunciation of the initial dental sibilant of "sù" (宿), resulting in the syllable "shù".

In some examples, it is difficult to say whether the interfering segment is anticipated or perseverated:

Ex. 26. "...都 要 求 考 托 kú... 托 福, 考 完 了 才 去."
"... dōu yāoqiú kǎo Tuō*kú... Tuōfú, kǎo wánle cái qù." ("...they all require that you first take the TOEFL test, then you can go.")

("Tuōfú" 托 福 is the Chinese transliteration of "TOEFL", the Test of English as a Foreign Language.) Most likely the initial /k/ of the syllable "kǎo" (考) masked the initial of "fú" (福), but since that syllable occurs both before and after the target, it is hard to say which one is responsible for the error. It is in fact very likely that both were contributors, since a word that appears several times in the processing stack is obviously highly active.

Nooteboom (1969) notes that unstressed syllables are not usually involved in anticipation or perseveration errors. This seems to be the case in almost all the Chinese errors I have collected, though perhaps these suprasegmental considerations are somewhat more complicated in Chinese than in English, since in Chinese (where much of the intonational resources of the language is taken up in communicating semantics) stress usually

must be accomplished partly by an intensification of whichever tone the syllable carries.

2.2. Blends (交 错 语 误)

Charles Hockett was one of the first linguists to use evidence from the inadvertent blending of two words or phrases in speech as the basis for theories about the phonetic and syntactic processes of speech production (Hockett, 1967). Many linguists and writers have since taken an interest in the phenomenon, and have collected and catalogued many thousands of examples. The phenomenon is known by many names, including "anacoluthon", "contamination", "malaphors" (Harrison, 1976), "syntactic blends" (Cohen, 1987), etc.

The speakers of any language have at their disposal an enormous repertoire of stock phrases, linguistic chunks, metaphors, idioms, clichés, proverbs, and colorful images from which to draw. Some share similar syntactic structure, others exploit a common pool of cultural myths and archetypes. Some have as key components words that, via homonymy, synonymy, antonymy, or any number of other types of associations, can link them to a host of other such phrases. Given the complexity of human experience and the time pressures of everyday speech, it is not surprising that often two or more of these phrases can bubble up in the mind and interact with each other in unexpected ways, as in the following example:

Ex. 27. "That was a breath of relief."

This sentence is a cross between two stock English phrases — "a breath of fresh air" and "a sigh of relief". Note that the semantic proximity of "breath" and "sigh" no doubt had a contributory effect to the blend, resulting in a smooth splice that is both syntactically and semantically plausible. Indeed, it is a great testimony to the power and suppleness of the mental mechanisms involved in the stages of lexical retrieval and syntactic structuring that most blends of this kind go completely unnoticed by both the hearer and the speaker. In addition, there is general agreement among those who have studied blends that two (or more) words that combine to form the error are very often synonyms and are usually equally appropriate in the context of the utterance (Fromkin, 1973, and Garrett, 1975). All of the examples in this section seem to support this principle.

Some other examples:

Ex. 28. "Sagan just scratched the tip of the iceberg in that interview."

a. scratched the surface
b. the tip of the iceberg

Ex. 29. "She really stuck her neck out on a limb."
a. went out on a limb
b. stuck her neck out

Ex. 30. "He's an *easy-go-lucky fellow."
a. happy-go-lucky
b. easy-going

Blends can also occur at the word level. For example:

Ex. 31. "This computer is completely *kapunct."
a. kaput
b. defunct

Ex. 32. "Smoking isn't some kind of character *default."
a. character fault
b. character defect

Ex. 33. "That was pretty *upsettling."
a. upsetting
b. unsettling

One of Wells' laws of speech errors states: "If the two original words contain the same sound in the same position, a blend of them will contain that sound in that position" (Wells, 1951). The previous example is just such a case, as is the "easy-go-lucky" example above.

Various other examples of blends can be found in Hofstadter & Moser (1989) and in the work of Gerald Cohen (e.g. Cohen, 1987), whose collection contains thousands of subtle and interesting examples.

One finds such blends in Chinese, too, of course. I have found it useful to divide my examples into two categories: word blends and phrase blends. The following are just a few examples:

2.3. Word blends (词的交错语误)

Ex. 34. "她精力旺沛."
"Tā jīnglì *wàngpèi." ("She's full of vitality.")
    A blend of:

a. 旺 盛 wàngshèng   ("vigorous, exuberant")

b. 充 沛 chōngpèi ("full, abundant")

Ex. 35. "得 让 他 去 叫 那 个 姑 娘 来. 她 来 的 时 候 咱 们 怂 动 怂 动."

"Děi ràng tā qù jiào nèige gūniang lái. Tā lái de shíhou zánmen *sǒngdòng sǒngdòng." ("We should get that girl to show up. When she gets here we can get something going." Said by someone trying to encourage a romance between one of his male friends and a woman he knew.)

a. 怂 恿 sǒngyǒng ("instigate, incite, abet")

b. 鼓 动 gǔdòng ("agitate, arouse, instigate")

The fact that the word "dòng" (动), meaning "to move", is used in many other semantically-related combinations (such as "jīdòng" (激 动), "excite or agitate", "hōngdòng" (哄 动), "to cause a sensation", and "cèdòng"(策 动), "to stir up") helps give the utterance greater plausibility.

Ex. 36. "走 蛋!"

"Zǒu dàn." ("Get out!")

a. 走 人 zǒurén ("Get out, leave.")

b. 滚 蛋 gǔndàn ("Beat it! Scram!")

In the previous three examples, the two competing compounds are spliced rather neatly together, with both the segments and tones of the two uttered syllables left intact. The following example is somewhat different:

Ex. 37. "等 一 huà ."

"Děng yí*huà." ("Wait a moment.")

a. 等 一 下 děng yíxià ("wait")

b. 等 一 会 儿 děng yìhuǐr ("wait a moment")

Note that, logically, a blend of the segments of the syllables "xià" and "huǐr" could have produced combinations such as " ꟼUƎ⅃ " or " ꓫiA ", but since these sounds violate the phonological constraints of the language, they would never be generated. (Or seldom so. Hockett in his 1967 paper provides some counterexamples to Wells' First Law, and argues for the blurriness of phonological constraints.) The previous example is one of the few Chinese blends I've been able to collect in which a syllable actually undergoes some sort of morphological transformation as a result of the blend. This state of affairs is very common in English:

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Ex. 38. "That didn't bother me in the *sleast.
  a. in the least
  b. in the slightest

Theoretically possible but highly unlikely splices that would have left the syllable boundaries intact would be "slightleast" and "leastest", in which meaningful syllables or bound morphemes ("-est") are patched together (a state of affairs that is similar to all the Chinese blends above). But here the result of the blend is a meaningless syllable with phonetic features of both competing words. (The "kapunct" example above is another instance of this.) My guess is that this latter phenomenon is more common in Chinese than my collection would suggest. And note that there are many examples of morphological change in the anticipation and perseveration errors above, though those errors involve the interference of a word already retrieved and waiting in the processing stack, whereas blends involve simultaneously retrieved words and thus perhaps a different processing stage.

On the other hand, there may be facts of Chinese phonology itself that would affect the characteristics and relative frequency of such blends. For example, Mandarin Chinese has only two final consonant sounds, /n/ and /ng/ (and perhaps the retroflex /r/ of Beijing dialect), whereas English has a large number of final consonants and consonant clusters. We know also that Chinese is morphologically less complex than English; that is, there are fewer morphemes and the morphology of each syllable is more constrained. A Chinese syllable can have a maximum of only four segmental phonemes (plus one of four tones), whereas English can have up to seven phonemes per syllable (DeFrancis, 1984), in combinations sometimes devilishly hard to pronounce for non-native speakers (e.g. the word "sixths"). Does this difference between Chinese and English have any implications for the production of blends and other errors, or for the relative importance of the different stages of speech production in Chinese? Though it is probably reasonable to assume that the overall processing load for speech production in all languages is very nearly the same, that doesn't necessarily imply that the load involved at each individual processing stage (lexical retrieval, syntactic structuring, intonational contour, etc.) is equivalent across languages. A close look at the phonological regularities involved in blends and their relative frequency in the language could provide clues to such questions.

2.4. Phrase blends (短语的交错语误)

Ex. 39. "你 说 得 跟 天 花 一 样 好."
"Nǐ shūode gēn *tiānhuā yíyàng hǎo." ("What you said was beautifully eloquent.")

　　a. 跟 天 女 散 花 一 样 gēn tiānnǔ sǎnhuā yíyàng ("like heavenly maidens scattering flowers")

　　b. 跟 花 一 样 好 gēn huā yíyàng hǎo ("as good as a flower")

The fact that this blend of two stock phrases happened to produce a genuine (but here ludicrously inappropriate) word "tiānhuā" (天 花, "smallpox"), is no doubt partly what enabled the mistake to slip past the syntactic and semantic editing mechanisms in speech. Note also the complex way in which elements from the two phrases were combined to result in the hybrid utterance. The following example is a more straightforward splice:

Ex. 40. "我 得 先 让 自 己 在 美 国 游 刃 自 如 地 办 些 事…"
"Wǒ děi xiān ràng zìjǐ zài Měiguó *yóurènzìrú de bàn xiē shì…" ("I first have to skilfully manage some affairs in America…")

　　a. 游 刃 有 余 yóurènyǒuyú ("handle a butcher's cleaver with ease — do a job with skill and ease")

　　b. 自 如 zìrú ("smoothly and easily")

Though the second competing element here, "zìrú" (自 如), could not have grammatically functioned by itself in the utterance, it nevertheless was active in the process of lexical retrieval as a compositional element in a *class* of phrases such as "bǎwòzìrú" (把 握 自 如, "easily master"), "yùnyòngzìrú" (运 用 自 如, "use skillfully"), etc., so that the resulting blend is a very plausible utterance. Also, in keeping with Wells' Third Law, which states that if the two original words contain the same sound in the same position, a blend of them will contain that sound in that position, note that the competing phrases end with phonetically similar morphemes, both carrying a second tone. Presumably, *similar* sounds can have the same kind of contributory effect to a speech error that *identical* sounds can, and obviously tone must be considered here as part of any metric of similarity.

Ex. 41. "在 我 来 看…"
"Zài wǒ lái kàn…" ("As I see it…")

　　a. 在 我 看 来 Zài wǒ kàn lái ("As I see it…")

　　b. 对 我 来 说 Duìwǒ lái shuō ("For me…)

This is a good example of the kind of blend that is so smooth and subtle that it is immediately mentally corrected by both speaker and hearer, and thus goes completely unnoticed.

One often encounters blends involving idioms, as well. For example:

Ex. 42. "这 就 是 朝 三 暮 楚."
"Zhè jiù shì zhāo sān mù Chǔ." ("That's being fickle.")
　　a. 朝 三 暮 四 Zhāo sān mù sì ("To receive three portions in the morning and four in the afternoon — play fast and loose, blow hot and cold.")
　　b. 朝 秦 暮 楚 Zhāo Qín mù Chǔ ("To serve the state of Qin in the morning and the state of Chu in the afternoon — to be fickle.")

Gibbs and Nayak (1989) have done experiments that suggest that the idioms in a language do not form a unique class of linguistic items, but rather that some idioms are more "transparent" (that is, their semantic content is more obvious) and thus more syntactically flexible and productive, while other idioms are more "opaque" (i.e., more like dead metaphors) and cannot be syntactically altered without losing their meaning. For example, the sentence "Jane laid down the law" can be passivized to read "The law was laid down by Jane" and still retain its original meaning, whereas the sentence "Jane kicked the bucket" loses its figurative meaning when passivized to "The bucket was kicked by Jane".

Such a fact might have implications for errors in Chinese, a language with thousands of four-character idioms (成语), many of which draw upon classical Chinese for their vocabulary and syntax, and which might thus be expected to be relatively opaque to many native speakers of the language. Idioms that have semantically "fossilized" are probably less likely to mix and combine with other idioms in speech errors, whereas idioms that are semantically transparent or merely somewhat "moribund" (that is, their literal meaning is theoretically available but not necessarily highly active) are more likely to be involved in blends.

Looking at blends, one can see a glimpse of the competing concepts and words involved in the production of a particular sentence. But of course, sometimes one can see this process at work not because a blend is produced, but simply because the speaker tries several competing words before deciding on one, as in the following:

Ex. 43. "因 为 说 北 大 的 是 写 诗 的 朋 友 们, 没 有… 不 一 定 要 什 么, 为 了 什… 有 什 么 轰 动 性… 煽 动… 煽 动 性 的 这

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种 语 词."

"Yīnwéi shuō shì Bei Dà de dōu shì xiě shī de péngyoumen, méiyǒu... bù yídìng yào shénme, wèi le shénme... yǒu shénme hōngdòngxìng... shāndòng... shāndòngxìng de zhè zhǒng yǔcí." ("Because saying all our friends at Peking University are poets doesn't mean... I don't necessarily want to... I don't mean it to have some kind of sensational... inflam... inflammatory tone.")

"Hōngdòng" (轰 动, "cause a sensation") and "shāndòng" (煽 动, "instigate, stir up") are words with similar meanings, of course, and one can hear the speaker floundering around trying to decide on the most appropriate word choice. No doubt other competing words were active, but did not appear in the utterance itself. In a slightly more hurried or flustered context, this indecision might have resulted in the same kind of blend seen in some of the examples above.

2.5. Exchanges (颠 倒 语 误)

Exchanges involve the swapping of two phonemes or words, usually but not always within the same phonemic clause. For example:

Ex. 44. "Imagine owning a *bet pat." (pet bat)

Ex. 45. "He's crying because he just slammed his door in the finger." (his finger in the door)

Ex. 46. "Did you remember to bike your lock?" (lock your bike)

In errors involving the exchange of two whole words, the two words are almost always of the same word-class, i.e., nouns swap with nouns, verbs with verbs, etc. (Hotopf, 1980, Nooteboom, 1973). The last example seems to be an exception to this, but note that both "bike" and "lock" can be either a noun or a verb, and this is what enables the utterance to slip past the syntactic editors involved in speech production.

My examples in Chinese seem to adhere to this principle of invariant word-class as well:

Ex. 47. "书 在 笔 上 呢."

"Shū zài bǐ shang ne." ("The book is on the pen.")

Where what was meant was "Bǐ zài shūshang" (笔 在 书 上, "The pen is on the book"). 笔 and 书 are both nouns, of course. Exchanges involving

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different word classes — for example, noun-verb exchanges such as "Bǐ wǒ gěi" (笔 我 给, "Pen me the give") for "Gěi wǒ bǐ" (给 我 笔, "Give me the pen") — are theoretically possible but virtually nonexistent in everyday speech.

In the following example, the symmetrical prosody of the phrase contributes to the error:

Ex. 48. "骂 不 还 手, 打 不 还 口."
"Mà bù huán shǒu, dǎ bù huán kǒu." ("If someone curses you, don't strike back; if they strike you, don't curse them back.")

The target was "Mà bù huán kǒu, dǎ bù huán shǒu" (骂 不 还 口, 打 不 还 手, literally, "If someone curses you, don't curse back; if they strike you, don't strike back"), meaning "not to return an insult, to turn the other cheek". The fact that "shǒu" (手) and "kǒu" (口) share the same final makes the swap more plausible.

Interestingly, there can sometimes be other factors in the sentence that give rise to an exchange, as in this example, where the exchange seems to be the result of an anticipation:

Ex. 49. "有 卖 扇 电... 电 扇 的 商 店 吗?"
"Yǒu mài *shàndiàn... diànshàn de shāngdiàn ma?" ("Are there stores that sell electric fans?")

Here the fact that the word "shāngdiàn" (商 店, "store") was on the processing stack of words about to be uttered seems to have caused a syllable exchange in the word "diànshàn" (电 扇, "electric fan") due to phonetic similarity.

2.6. Substitutions (代 换 语 误)

Substitutions occur when the intruding segment or word does not come from the sentence itself:

Ex. 50. "Cutting beards requires special pliers." (meaning "special scissors")

Ex. 51. "You'll have to talk to the guy who waters the gardener."

Here the intended meaning was " You'll have to talk to the guy who waters the flowers." The word "gardener", being also highly active, seems to have been substituted for the word "flowers", but the phrase could also be

analyzed as a blend of "You'll have to talk to the guy who waters the garden" and "You'll have to talk to the gardener". The following is a somewhat isomorphic example in Chinese:

Ex. 52. "那 个 开 司 机 的 ..."
"Nèige kāi sījī de..." ("That driver..."; literally, "driver of the driver")

The word "sījī" (司 机, "driver"), seems to have substituted for the word "chē" (车, "car"), but it is also possible that the phrase is merely a blend of the words "kāichēde" (开 车 的, "the one who drives the car"), and "sījī" (司 机).

Substitution errors are often interesting examples of the phenomenon of spreading activation, and often reveal aspects of the "semantic halo" of associated concepts that surround each word. For example, the substitution of "pliers" for "scissors" above is hardly a random intrusion; the concept of "pliers" is clearly a close neighboring concept to that of "scissors". (This issue is dealt with further below. See Aitchison, 1987, Dell & Reich, 1980, and Hofstadter, 1985 for more on these ideas.)

2.7.   Errors involving haplology (聚 结 语 误)

The phenomenon of haplology involves the collapsing of two successive words or phrases into one, invariably with some truncation or loss of information at the point of union of the two elements:

Ex. 53. "Here's Mozart symphony number *twine...twenty-nine."

Ex. 54. "If you're willing to go through some *momenterror... momentary terror, you'll be okay."

This sort of process of "fusion" often occurs at a point where the two words share a common phoneme, as in the last example, but this is by no means always the case.
The following is a similar error in Chinese:

Ex. 55. "经 济 不 担 心，如 果 再 不 扩 大 进 口，今 年 顺 差 金 额 很 kěng ... 很 可 能 超 过 一 百 亿 美 元."
"Jīngjì bù dānxīn, rúguǒ zài bu kuòdà jìnkǒu, jīnnián shùnchā jīn'é hěn *kěng... hěn kěnéng chāoguò yì bǎi yì Měiyuán." ("There's nothing to worry about with the economy; if imports don't increase, the trade balance will very likely be more than ten billion American dollars.")

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In this example the syllable "kě" and "néng" were simply melded into one morpheme, "kěng", with the tone of the first element and the final of the second left intact.

A special case of haplology is the phenomenon of "cannibalism" (Hofstadter & Moser, 1989), in which two successive instances of a word or syllable appear, and one of them is "eaten" by the other:

Ex. 56. "Look! An MIT-shirt!" (MIT T-shirt)

Ex. 57. "You either have to either (a) have a good job or (b) independently wealthy." (Meaning "...or (b) be independently wealthy.")

The following is an example of cannibalism (噬同语误) in Chinese:

Ex. 58. "这种车非常非常见！"（非常非常常见）
"Zhè zhǒng chē fēicháng fēi cháng jiàn." (fēicháng fēi cháng chángjiàn)
("This kind of car is very, very common.")

Certain kinds of haplology are so common in Chinese that it is difficult to say whether or not such cases constitute an error. For example, Zhao Yuanren (1968) notes that two successive instances of the particle "de" (的) are often reduced to one, as in the case where someone asks "Zhè shì shéi de kuāngzi?" ("这是谁的筐子？", "Whose basket is this?"), and the reply is "Shì nèige mài càide" ("是那个卖菜的", "It's the vegetable seller's"). Logically, the response should be "Shì nèige mài cài de de" ("是那个卖菜的的"), but no native speaker ever says such a thing.

In the following example, a woman was expressing concern over the possibility that her husband might have been on board a hijacked airplane:

Ex. 59. "只要不是我亲爱的飞机，我就放心了."
"Zhǐ yào búshì wǒ qīn'ai de fēijī, wǒ jiù fàngxīn le." ("As long as it wasn't my darling['s] plane, I have nothing to worry about.")

Logically, she should have said "...wǒ qīn'ai de de fēijī..." (...我亲爱的的飞机...). (The particle 了 (le) is also subject to similar kinds of deletion due to haplology.) It might be hypothesized that this phenemenon is partly the result of a monitoring mechanism in speech production that balks at exact repetition; that is, a kind of editing gremlin that, when it encounters duplicated morphemes, says "This has already been said. No

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need to say it again."

These examples are perhaps instances of a broader phenomenon in Chinese, namely a general avoidance of repetition of elements in compound nouns. Zhao Yuanren has noted this phenomenon in certain noun phrases he calls "telescoped compounds". For example, the word "liúxuésheng" (留 学 生, "a student studying abroad") is properly analyzed as a shortened form of "liúxuéxuésheng" (留 学 学 生). Other examples from Zhao are:

人 类 学 + 学 会   becomes   人 类 学 会
Rénlèixué + Xuéhuì   Rénlèixuéhuì
human + study + study + society   human + study + society
i.e. "Anthropological Institute"

陆 军 部 + 部 长   becomes   陆 军 部 长
Lùjūnbù + bùzhǎng   Lùjūnbùzhǎng
army + ministry + ministry + head   army + ministry + head
i.e. "army minister"

Other examples that are perhaps questionable are:

Ex. 60. "不 喜 欢 这 种 快 餐 馆." (快 餐 餐 馆)
"Bù xǐhuān zhè zhǒng kuàicānguǎn." (kuàicān cānguǎn?)
("I don't like this kind of fast food restaurant.")

Ex. 61. "我 们 上 个 星 期 天 在 那 个 天 主 教 堂." (天 主 教 教 堂?)
"Wǒmen shàngge xīngqītiān zài nèige Tiānzhǔjiàotáng." (Tiānzhǔjiào jiàotáng?) ("We were at that Catholic church last Sunday.")

Haplology is also a very common phenomenon in written errors, as will be seen later in the following section.

3. Written errors (笔 误)

Many error researchers (e.g., Ellis, 1979 and Hotopf, 1983) have noted that written errors often involve the same kinds of phenomena (anticipations, perseverations, etc.) as are observed in spoken errors. This is not surprising, given that speaking and writing involve many of the same underlying cognitive mechanisms. However, it is obvious that the timing conditions under which we speak are very different from those of writing.

Given this, we would expect fewer lexical errors such as blends and substitutions in writing than in speaking, since there is simply more time to retrieve the proper word and to edit errors. But this longer time span between a word's retrieval and its writing gives rise to other kinds of errors that will be dealt with in the following sections.

The hypothesis that, in the process of writing, words are first retrieved in phonological form has never been contested, and it seems likely that this is true of Chinese as well, despite some controversy regarding such things as the relative extent of phonological recoding in reading Chinese characters vs. reading alphabetic scripts. (See Hung & Tzeng, 1981 for a good overview of this issue.) As will be seen below, many of the kinds of errors that occur in the writing of English (and presumably any alphabetic script) have analogous counterparts in Chinese, and this fact argues for the hypothesis that the writing of both Chinese script and alphabetic scripts involve many of the same mechanisms and strategies of retrieval and execution.

3.1. Substitution errors (代换语误)

I will deal here with three kinds of substitution errors in writing: (a) high-level semantic substitutions; (b) the substitution of a homophone or quasi-homophone and (c) substitutions as a result of capture errors.

3.1.a. Semantic substitutions

As was mentioned earlier in the section on substitutions in speech, the substitution of one word for another can often provide information about the semantic halo surrounding a particular word, as well as information about category boundaries and distances between concepts in the mind. The fact that so many substitution errors involve opposite concepts (e.g., "In the case of a mother divorcing her wife...er, husband...") or concepts from the same region of semantic space (e.g. "There's nothing like that moment a football player crosses the finish line... I mean, goal line...") is evidence for a spreading-activation model of language processing, which features active concepts spreading their activation to other close neighboring concepts, one of those close neighbors being, of course, the opposite concept.

This is an area of error-making in which one would expect to find exactly the same kinds of phenomena in both Chinese and English (or any language), in that this domain seems unlikely to have differing frequencies based on language-specific effects. I will not deal with examples such as the two given in the previous paragraph, except to say that I have, not too

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surprisingly, observed many such examples in Chinese. I will, however, give a couple of examples where the general mechanism of spreading activation and specific facts of the language both play a role in the explanation of the error. Such an explanation is called for in the following written error:

Ex. 62. "我 在 他 们 家 有 时 候 不 想 吃 筷 子."
"Wǒ zài tāmen jiā yǒu shíhou bù xiǎng *chī kuàizi." ("Sometimes, when I'm at their place, I don't feel like *eating chopsticks.")

What was intended was "shǐ kuàizi" (使 筷 子, "use chopsticks"), not "chī kuàizi" (吃 筷 子, "eat chopsticks"). Obviously the concept of eating was highly active during the writing of the sentence, and the slight phonetic resemblance of "chī" (吃) and "shǐ" (使) was enough to cause 吃 to be substituted. The phonetic similarity in the target and the substituted word is also evidence for the phenomenon of phonetic decay in short-term memory, which is dealt with more below.

Often an error seems to have several different contributing pressures, any of which might explain it, as in the following:

Ex. 63. "你 到 芝 加 哥 我 就 给 你 买 二 双."
"Nǐ dào Zhījiāgē wǒ jiù gěi nǐ mǎi èr shuāng." ("When you get to Chicago I'll buy you two pairs.")

Here the person intended to write 一 双, "one pair", and instead wrote 二 双, "two pair". One explanation is that there was a sort of low-level motor-command anticipation error involved; that is, the fact that the writing of 双 involves a simple repetition of the component 又, and this "doubling command" was anticipated when writing 一. (This sort of error is extremely common in English, as when one writes or types "leeter" for "letter".) Another explanation is that the notion of "pair" spread activation to the concept "two", and this made it very easy for a slip of the pen to occur, making 二 out of 一. These two explanations are not necessarily competing, of course, and it is very likely that both contributed somewhat to the resulting error.

3.1.b. Homophone (and quasi-homophone) substitutions (同 音 混 淆 笔 误)

The substitution of a homophone in a written sentence is very common in English:

Ex. 64. "This goes against *won's principles..." (one's principles)

Ex. 65. "...if we can get the problem *sordid out..." (sorted out)

Ex. 66. "If I were you, I *wouldent want it..." (wouldn't want it)

Ex. 67. "...unless she's an exceptionally bright *puple" (pupil)

These errors seem to indicate that in the process of writing, words and phrases are retrieved and stored in a kind of short-term memory buffer (in their phonological rather than in their graphological form). When the time comes to transfer these words to the page, the writer often uncritically transcribes the sound in memory, resulting in a homophonic but inappropriate word or words. It is important to note that this process does not merely involve the phonetic spelling out of phonemes, but rather involves the substitution of a pre-existing homophonic word or at least a plausible-looking non-word. In other words, one never sees such things as "surchiz" for "searches" or "digz" for "digs", but rather one sees either a straightforward homonym substitution (as in "sordid" for "sorted"), or a slightly modified version of the target word (such as "wouldent" for "wouldn't" or "nonsents" for "nonsense").

One also sees this phenomenon in Chinese:

Ex. 68. "这 里 的 自 来 水 可 以 *引 用."（可 以 饮 用）
"Zhèli de zìlái shuǐ kěyǐ yǐnyòng."
"You can quote the tapwater here." (Should be "drink the tapwater".)

Ex. 69. "我 过 去 的 朋 *有 也 越 来 越 少..."（朋 友）
"Wǒ guò qù de péngyou yě yuè lái yuè shǎo..." ("My former friends are also fewer and fewer...")

The substitutions here are exact homophones, and involve no semantic similarity whatsoever, which indicates that the errors are truly the result of phonetic transcription of the stored word, and not attributable to semantic factors. Of course, other factors can very often contribute to homophone substitutions, as in the following example:

Ex. 70. "你 没 有 钱，找 到 工 作 之 钱，应 该..."（找 到 工 作 之 前）
"Nǐ méi yǒu qián, zhǎodào gōngzuò zhī qián, yīnggāi..." ("You haven't got

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any money.   Before finding a job, you should...")

Here the homophonic character 钱 (qián,"money") was substituted for 前 (qián, "before"), but the error was clearly facilitated by the fact that the concept of "money" was already highly active and the character for the concept had just been written.   The slip could also be classified as a straightforward perseveration error, but it is likely that all three factors — perseveration, spreading activation, as well as simple homophonic substitution — contributed something to the result.

There has been much debate about the extent to which speakers of Chinese utilize the phonetic information in Chinese characters in processing or producing written text.   DeFrancis (1984, 1989), Hung & Tzeng (1981), and others have argued that, despite its reputation to the contrary, Chinese script is by any definition of the term a phonetic script, and native speakers can thus be expected to use the same kinds of mechanisms for retrieving, writing, or phonetically recoding Chinese characters as speakers of English use in processing English text.   Much of the evidence from written errors in Chinese also seems to support this view, and the previous three examples indicate that the processing strategies used by writers of Chinese characters are similar to those employed by writers of English and other alphabetic scripts.

If a target word, once retrieved, waits in short-term memory long enough, very often the result is partial forgetting or "phonetic decay" — a loss or degradation of the phonological information in the word (Hotopf,1983).   The following are a few examples in English from written texts:

Ex. 71.   "...particularly with this letter..."   (with this weather)

Ex. 72.   "I might as well twin around and do it again."   (turn around)

Ex. 73.   "Okay, so far, find."   (so far, fine)

Here as well, we find the same phenomenon in written Chinese:

Ex. 74. "你 先 来 吧, *可 定 会 有 人 帮 助 你." (肯 定)
"Nǐ xiān lái ba, *kědìng hùi yǒu rén bāngzhù nǐ." ("Just come, there will certainly be someone to help you.")

It seems clear that what was lost here in the process of phonetic decay was the ending consonant /n/ of "kěn" (肯) resulting in the substitution of the

character 可 (kě). It is also possible that the writer was subconsciously considering another word such as kěnéng (可能, "possibly"), and the phonetic similarity of kěn and kě contributed to one being substituted for the other.

As with many other earlier examples, the mechanism of spreading activation can reinforce or be a contributing factor to a homophone substitution:

Ex. 75. "你 考 完 TOEFL 以 后，还 有 三 封 *托 荐 信·" (推 荐 信)
"Nǐ kǎo wán TOEFL yǐ hòu, hái yào yǒu sān fēng *tuōjiàn xìn." ("After you've taken the TOEFL, you also have to get three letters of recommendation.")

Even though here the word "TOEFL" was written in English, the Chinese word for the term, "Tuōfú" (托福), was no doubt also highly active in the writer's mind (the writer may even have briefly considered writing the word in Chinese rather than English), and this resulted in a substitution of 托 (tuō) for 推 (tuī), no doubt helped along by the phonetic similarity between "tuō" and "tuī". Note also that the two characters share the same left hand component, and this also could have helped to push the substituted character over a certain threshold of activation, causing it to be written in place of the target. (See the section on "capture errors" below for more on this phenomenon.)

There are a surprising number of written substitution errors in which the substituted character is a homophone with respect to its segments, but the tone of the character differs from that of the target:

Ex. 76. "你 可 以 听 出 一 个 甚 至 并 没 有 出 *显 在 句 子 中 的 词…" (出 现)
"Nǐ kěyǐ tīngchū yíge shènzhì bìng méiyǒu chū*xiǎn zài jùzi zhōng de cí…" ("You can detect a word that didn't even appear in the sentence.")

Ex. 77. "真 *想，真 好 吃·" (真 香)
"Zhēn *xiǎng, zhēn hǎo chī." ("Really tasty, really delicious.")

This phenomenon is to be expected given the fact that, as was mentioned earlier, the tones of Chinese play a role similar to that of vowels and consonants in other languages in distinguishing semantically distinct morphemes or words from one another. In other words, the tone of a syllable is just one more of its informational aspects that can be modified or degraded while in short-term memory. (This does not necessarily imply

that the suprasegmental aspect of the syllable and the segmental aspect are of equal importance — just they are is similar in kind.) And here again, it can be seen that, just as with corresponding errors in English, the error in Chinese is a result of the phonetic transcription of the phonological information in the memory buffer.

While it is certainly the case that Chinese speakers, like English speakers, employ text-processing strategies that make use of the phonetic information in the script, it is by no means the case that both languages are phonetic to the same extent. As just one example, note that the phonetic information in an English word contains a great many clues as to the pronunciation of the various segments of that word, whereas the phonetic information in a Chinese character at best merely codes for an entire morpheme of the language. (The letters in the word "bell" can be analytically broken up to represent phonemes thus: b + e + ll. But in the corresponding Chinese character, 钟, the phonetic half of the character (中) represents the entire syllable "zhōng".

One important consequence of this difference is that, as an English speaker writes a sentence on the page, there is a constant stream of visual *phonetic feedback* (albeit imperfect in nature) that is rather fine-grained and constant, whereas for a Chinese speaker the phonetic information is more sporadic (not all characters contain phonetic components) and coarse-grained (i.e., at the morpheme level rather than at the phoneme level). It is possible that this difference is reflected in the relative incidence of certain kinds of written substitution errors in Chinese and English. For example:

Ex. 78. "你 先 看 一 下 那 些 *画 像..." (图 像)
"Nǐ xiān kàn yíxià nèi xiē *huàxiàng..." (túxiàng)
"First look at these portraits..." ("Drawings" was intended)

Ex. 79. "对 于 他 的 话, 我 真 假 *易 辨." (真 假 难 辨)
"Duìyú tā de huà, wǒ zhēn jiǎ yì biàn." (zhēn jiǎ nán biàn)
"As for what he said, I can easily separate the fact from the fiction." (The intended phrase was "find it hard to separate fact from fiction".)

Both of these errors occurred during the transcription of a tape, and in the first example, the writer was actually *saying* the word "túxiàng" (图 像) out loud as he was *writing* 画 像 (huàxiàng). The equivalent error in English seems very unlikely; that is, someone saying out loud the word "drawing" while writing the word "portrait". The information given to the

writer of English in visual phonetic feedback would very quickly tell the writer that the letters in "portrait" could not possibly code for the sounds of "drawing". (That English speakers use knowledge of phonetic segmentation in reading and writing is generally accepted, though the extent to which this skill is present in all users of the language is somewhat controversial. See Liberman et al, 1977.) By contrast, once the writer of a Chinese sentence sends the motor commands to execute the character 画 (huà), there is no phonetic information in the components of the character to prod him or her into an awareness that the sound of this character is not the sound of the desired character 图 (tú). (There is evidence that speakers of Japanese, whose written language uses a syllabic script along with Chinese characters, do not develop a linguistic awareness of individual phonemes as English speakers do, and this difference suggests that users of a script that represents phonemic information routinely make use of this information in reading and writing. See Mann, 1986.)

A further example: A rather common error in the writing of Chinese is the swapping of two characters of a two-character word, as in the following:

Ex. 80. "...因 为 我 从 来 没 到 过 *约 纽..." (纽 约)
"...yīnwéi wǒ cónglái méi dàoguo *Yuēniǔ..." (Niǔyuē)
"...because I've never been to York New..." (New York)

It has been my experience observing Chinese people writing that such errors are usually caught before the completion of the second character, but completed swaps such as the above are by no means uncommon. It is rather hard to imagine the corresponding error in English; that is, the writing of "York New" for "New York". Such intuitions argue for the view that the phonetic information in Chinese script is less available to Chinese speakers than the phonetic information in English is to speakers of that language.

Tzeng & Wang (1983) also speculate that there may be some fundamental differences in the processing of Chinese and English print. They suggest that "a reader of English cannot keep from applying a system of abstract rules to tackle the correspondence between letters and spoken segments, whereas a reader of Chinese automatically scans the configuration of the logographs" (p. 239). This difference would no doubt apply to writing as well as reading. Note the kind of English homophone error mentioned earlier, where a writer, applying an English spelling heuristic, writes "shop tock" instead of "shop talk". This sort of error is impossible in Chinese (unless one counts the substitution of a reasonable but mistaken phonetic component, such as writing 佼 幸 for 侥 幸 (both

pronounced "jiǎoxìng") but this does not involve the same kind of analytic piecing-together of phonemes as the English example). These differences once again suggest that there are processing strategies open to users of an alphabetic script that are closed off, or are much less useful to, Chinese speakers.

Various scholars through the years, utilizing various metrics, have tried to rate the phoneticity of Chinese in comparison with other languages. Zhao Yuanren once (rather impressionistically) estimated that Chinese was about 25% phonetic, whereas English was about 75% so (Zhao, 1976). DeFrancis (1989), taking into account all the characters that have at least some phonetic value (if only to experts in the language) concludes that it is reasonable to say that Chinese is actually about 90% phonetic. In another study, Zhou (1978) found that the success rate in guessing the pronunciation of a given character based upon its phonetic component was only 39%. There are various criteria used to assess phoneticity, and a full treatment of the subject is quite beyond the scope of this paper. I bring up the issue merely to suggest that perhaps a cross-linguistic statistical analysis of the frequency of various types of homophonic substitutions or errors involving the phonetic information in Chinese and alphabetic scripts could provide evidence for the relative phoneticity of Chinese and other languages such as English.

But often such evidence, like some of what is presented in this section, can be contradictory. For example, contrast the 纽 约 — 约 纽 swap above with the following error in reading aloud a written text:

Ex. 81. "不 要 拘 *sù..." (拘 束)
"Búyào jū*sù..." ("Don't feel uncomfortable...")

where the speaker reported that the error was due to the influence of the phonetic role the component 束 (shù) plays in characters like 速 (sù) and 嗽 (sù). So the question remains: do readers and writers of Chinese use the phonetic information of their script in written language processing or not? The answer may be that there are many possible strategies open to Chinese speakers for the processing of text, each of which is employed separately or in tandem with other strategies according to the particular linguistic situation. Careful collection and study of various types of written errors could perhaps be useful in clearing up some apparent contradictions in this area of research.

3.1.c. Capture errors (挤 占 语 误)

Donald Norman includes capture errors in his categorization of various action slips (Norman, 1981). A capture error occurs when one action sequence smoothly switches over into another (usually more habitual) action sequence. This phenomenon occurs frequently in writing:

Ex. 82. "...and if you do this *enought, you will succeed." (enough)

Here the familiar sequence of letters "ought" as in words like "thought" and "fought" took over as the writer began the word "enough". Other lower-level capture errors can occur in the writing of individual letters, as when the loop of an 'h' is inadvertently closed to become a 'b', or when one starts to write an 'n' and ends up writing an 'm'.

Given the relative complexity and diversity of Chinese script, one would expect similar errors to arise in the writing of characters. The following written error is a possible example:

Ex. 83. "...那 种 防 *光 的 纸..." (防 火)
"...nèi zhǒng fáng*guāng de zhǐ..."
"That kind of light-resistant paper..." (should be "flame resistant")

The person committing the error reports that, once he had completed the first two strokes (﹀ and ╱) of the target character (火), a short vertical stroke (Ｉ) followed instead of the longer curved stroke (╰), resulting in the component (﹀Ｉ╱), which is a much more common stroke configuration, appearing in dozens of characters like 当, 常, 党, and, of course, 光, which might have then been selected over other candidates because of its slight semantic and visual similarity to the target. (Note here, however, that the stroke order for the first three strokes differs in ﹀Ｉ╱ and 火 .)
The following is a similar substitution resulting from a capture error:

Ex. 84. "你 不 会 因 此 而 生 我 的 *生 吧?" (生 我 的 气)
"Nǐ búhuì yīn cǐ ér shēng wǒ de *shēng ba?" (shēng wǒ de qì) ("You wouldn't get mad at me for this, would you?")

The first three strokes of the character 生 (namely ╱ , ━ , and below that another ━) are basically the same as the first three strokes of the character 气. This similarity, plus the probable perseverative effect of having just written the character 生, resulted in this capture error.

3.2. Anticipations (前 置 语 误)

Written anticipation errors basically come in two types: those that are a result of a processing mistake in the ordering of the sentence, and those that are the result of errors in the motor commands involved in writing. The mechanisms involved in the first type are usually rather high-level ones that only incidentally involve writing, and the issues raised in such errors are not much different from those raised in the examination of spoken anticipations. The second type is more low-level and involves the character components themselves, or other aspects of the writing system. We will deal only with the second type here.

One of the most common kinds of written anticipation errors is when a character component about to be written appears prematurely, usually in part due to some visual similarity to the target component:

Ex. 85. "真 没 畜 " (没 意 思)
"Zhēn méi [yìsi]" ("Really un[interesting].")

The 日 component of 意 and the 田 component of 思 share the same rectangular outline (the first three strokes are exactly the same), and this caused the component 田 to be anticipated. Note that this state of affairs has something in common with a capture error, though a capture error does not typically involve interference from a word or shape already in the processing stack waiting to be executed.

If a character component has to be repeated two or three times in the writing of a character, this can contribute to the component being anticipated:

Ex. 86. "西 方 的 音 乐 呢, 有 小 捏 " (小 提 琴)
"Xīfang de yīnyuè ne, yǒu xiǎo [tíqín]..." ("As for Western music, there's [the violin]...")

The implicit knowledge that two instances of the component 王 were about to be written caused a premature motor command to execute the component during the writing of 提.

Ex. 87. "他 不 唱, 他 又 " (他 嗓 子)
"Tā búchàng, tā [sǎngzi].." ("He didn't sing, his [voice]...")

Similarly, the character component 又 was anticipated as the writer began to write 嗓.

Ex. 88. "... 担 心 吊 胆 ..." (提 心 吊 胆)

"...dānxīn diàodǎn..." (tíxīn diàodǎn) ("to be on pins and needles")

Here the fact that the character 胆 was on the processing stack caused one of its components, 旦, to be anticipated, probably helped along by the facts that (1) the resulting character 担 is an existing character and 担 心 is a word, thus enabling the error to escape detection by the various visual feedback mechanisms; (2) the two characters 担 (dān or dàn) and 胆 (dǎn) are near homophones; and (3) the first five strokes of the substituted component 旦 and the component 是 are exactly the same.

According to Hotopf (1983), the programming of conversion of words in storage buffer to their graphological forms is usually done no more than one word ahead. It is interesting to consider whether errors such as the one above (in which the source of the interference and the target are four characters apart) constitute evidence for or against this claim, since first of all, it is often unclear what corresponds to a word in Chinese (does the above example contain four words, two words, or perhaps one?), and secondly, words in both Chinese and English can have several syllables, meaning that the word as a unit of time here is not particularly useful.

3.3. Perseverations (延 续 语 误)

Much of what has been said above about written anticipations also applies to perseveration errors. Perseverations can involve words, parts of words, and individual letters:

Ex. 89. "After thirty years of using *bothing approaches..." (both approaches)

Ex. 90. "That's something we don't *wan't..." (don't want)

Ex. 91. "I can really *appp̄ * " (The target was "appreciate".)

In example 91, the curved final stroke of the 'r' continued downward to become a loop due to the perseverative influence of the execution of the previous two 'p''s.

Some examples of this kind of phenomenon in Chinese:

Ex. 92. "这 个 品 和 " (品 种)

"Zhège pǐn [zhǒng]" (pǐnzhǒng) ("This [type]...)

The box which is written first in the component 中 (the right half of 钟) was written as a square rather than a rectangle because of a perseverative interference from the character 品.

Ex. 93. "他 被 打 得 鼻 ㄲ " (鼻 青 脸 种)
"Tā bèi dǎ de bí..." ("He got beaten [to a pulp]." lit., "nose black, face swollen")

The bottom element of 鼻 was perseverated in the execution of the beginning strokes of 青.

3.4. Haplology (聚 结 语 误)
Because of the relatively greater length of time required to write out a word as opposed to pronouncing it, errors of inattention are common in writing, and this inattention most often results in the omission of letters, usually in the middle rather than at the beginning or end of a word (Hotopf, 1983). This fact seems to suggest that errors involving haplology would be among the most frequent in written errors. (An example is the writing of "instition" for "institution", or, across word boundaries, the writing of "latestyle" for "latest style".)

This sort of error can take several forms in Chinese. One involves a simple omission of a character, which is certainly common enough. Another involves the omission of some character component, resulting in a hybrid nonsense character, as in the following example:

Ex. 94. "...在 比 辐 的 层 次..." (比 较 高)
"...zài bǐ[jiào gāo] de céngcì..." ("...at a [relatively high] level...")

As was the case in the section above on haplology in speech, cannibalisms (where one of two successive identical elements in the sentence seems to "eat" the other one) are very common in writing as well, as in the case where someone wanted to write the word "correct" in parentheses and ended up writing "(orrect)" instead of "(correct)". Apparently, the just-drawn parenthesis was perceived by the visual feedback mechanism as an abstract shape — a crescent — and this perception interfered with the arriving instructions to draw another crescent shape (the letter 'c'). Some other examples:

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Ex. 95. "What is so English about *Englis humor?"   (English humor)

Ex. 96. "... 5 econds..."   (5 seconds)

Another example in Chinese is the case where someone wanted to write the word 党员 (Dǎngyuán), "Party member", and found themselves writing the character 赏 (shǎng, "to grant or bestow"). Because both 党 and 员 share the element 口, the 员 character was able to "cannibalize" the 党 character, resulting in a smooth melding of the two.

4. Possible areas for further research

4.1.   Errors involving the four tones of Chinese can shed light on various psycholinguistic and psychoacoustic aspects of tones.   As I have said many times in this paper, the tones in Chinese play much the same role as do phonemes, but to what extent do these roles differ?   And to what extent are the tones and segments processed separately during speech production?   Li & Thompson (1977), in studying the acquisition of tone in children's speech, found that the tone system is mastered well in advance of the segmental system.   Focusing on errors in which tones are swapped, anticipated, or otherwise behave independently of segments might provide clues to the interdependence of the segmentals and suprasegmentals in speech processing.

In the same study by Li & Thompson, it was found that the high and falling tones (first and fourth, respectively) are mastered earlier and with less difficulty than the other two tones.   Kiriloff (1969) also reported that adult native speakers were more likely to confuse tones two and three. What other inherent psychoacoustic processing difficulties are involved with the tonal system?   A careful study of tone errors in both adults and children might provide anwers to such questions.

Gandour (1977) studied tone errors committed by Thai bilinguals that were partly the result of interference from a second dialect.   Such evidence from speech errors might be useful for the study of dialects and second-language acquisition, as well as for the study of the psycholinguistic implications of bilingualism in general.

The study of tone errors might provide new insights into the acquisition and application of tone sandhi rules in Chinese and other tonal languages.   Though I have not yet observed any errors involving tone sandhi, it is not unreasonable to suspect that such errors exist, and research on such topics could be built on such speech-error phenomena as "accommodation".   Accommodation can be illustrated by the following

example:

Ex. 97. "Put the heaviers book on top." (Put the heavier books on top.)

Here the grammatical morpheme /s/ was simply affixed to the wrong word. Had the /s/ come at the end of "books" as it was supposed to, it would have been unvoiced, but in the utterance it was voiced; the /s/ "accomodated" to its linguistic environment. This of course suggests that the misplacement error occurred at an earlier stage in processing before the phonetic representation of the utterance took shape, and thus provides clues to the order in which various grammatical and phonetic aspects of speech are processed (Garrett, 1980). One might look for similar accommodation effects in errors where tone sandhi is involved. For example, take a hypothetical error in which the sentence

Ex. 98. "桌 子 上 有 纸."
"Zhuōzi shang yǒu zhǐ." ("There's paper on the table.")

is transformed into the sentence

Ex. 99. "纸 上 有 桌 子."
"Zhǐ shang yǒu zhuōzi" ("There's table on the paper.")

by the error of simple exchange. Note that, according to the tone sandhi rule that in two consecutive third tones the first one changes to a second tone, the tones of the error-free sentence should be "Zhuōzi shang yóu zhǐ"; that is, the third tone of the character 有 (yǒu) changes to second tone. But in the sentence where the exchange error takes place, the syllable "yǒu" is no longer followed by another third tone, but rather by the first tone of the character 桌 (zhuō), and thus is not subject to a tone sandhi change. If, in such an error, the sentence was uttered as "Zhǐ shang yǒu zhuōzi", this would be an instance of accommodation similar to the English example above. If, on the other hand, such an error were ever to be uttered as "Zhǐ shang yóu zhuōzi", it would constitute evidence that the suprasegmental tones are processed prior to (or at least independently of) phonemes.

Suprasegmental aspects of language such as intonation and stress are much-slighted and somewhat poorly understood areas of linguistic research, and it would be worthwhile to investigate evidence from tone errors in order to gain fresh insight into these topics. The fact that a greater percentage of the intonational resources of Chinese are utilized in making semantic distinctions might call for much rethinking of existing

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theories about intonation, but no doubt a lot of new research could be built upon excellent work that has already been done in English by Cutler (1980) and Bolinger (1986).

4.2.   As has been mentioned above, the study of errors has been used to provide evidence for theories about the nature of the mental lexicon.   For example, Fromkin (1973) and others have noted that in exchange errors, grammatical morphemes often get left behind and affixed to the substituted word:

Ex. 100.   "Take the freezes out of the steaker."   (Take the steaks out of the freezer.)

Ex. 101.   "She's already trunked two packs."   (packed two trunks)

And often it is the grammatical morpheme itself that moves:

Ex. 102.   "Can you explain what first gave you this unfeeling of worthiness?"   (feeling of unworthiness)

Ex. 103.   "Is this coke's Julie?"   (Is this coke Julie's?)

Fromkin, Garrett (1980), and others have used such evidence to suggest that entries in the mental lexicon contain only word stems, and, with a few exceptions, grammatical and derivational morphemes are affixed by rule procedures.   In addition, errors in which non-words appear such as:

Ex. 104.   "You improve by observating the problem..."

seem to suggest that at least some of the time morphological rules must apply to roots or stems, since such words obviously don't exist in the lexicon.

It might be interesting to look for errors corresponding to the above examples in Chinese.   Since Chinese verbs never undergo the sort of morphological change that many English verbs do ("go" --> "went", "think"--> "thought") but rather are only subject to an additive process in which grammatical morphemes are affixed to the verb in order to express tense or aspect, Chinese perhaps constitutes a rather pure testing ground for theories in this area.   One might expect, for example, to find errors in which an exchange leaves behind grammatical particles like 了 and 着. One might also look for exchanges or substitutions involving the

complements in directional verbs such as 出来, 起来, 下去, etc., or resultative verbs such as 起 (as in 买得起) and 了 (as in 吃不了), etc.

4.3.   Chinese measure words, or classifiers, might be another place to look for instructive errors.   One of the ongoing questions asked about classifiers is: To what extent are they applied mechanically (like gender in Romance languages) and to what extent do they reflect deep cognitive aspects of human category boundaries?   There is general agreement among linguists that classifiers in most cases have some semantic function, and there are ongoing research projects in this area.   For example, Tai & Wang (1990) have studied similarities and differences in the use of classifiers across various Chinese dialects.

Children's errors in acquiring the classifier system of Chinese have already been used to support theories about the relevance of classifiers to human conceptual mechanisms.   Loke & Harrison (1986) and Clark (1977) have studied overextensions and misapplications of shape classifiers in young children learning Cantonese or Mandarin, and they have found that the stages Chinese children go through in mastering classifiers corresponds to the acquisition stages of shape concepts.   One of Clark's findings was that nearly all the criteria used by the young children in incorrect over-extensions of shape classifiers have corresponding classifiers in other languages with classifier systems.   This would seem to imply that both classifier systems and the underlying semantic system of children seem to have been cognitively based on the same universal principles governing categorization.   That is, children's overextensions provide information about the kinds of organizational principles humans use in trying to make sense of the world.   Mistakes in both children and adults involving classifiers could be used to extend existing work on categories by researchers such as Rosch (1973) and Lakoff (1987).

Allen (1977) brings up three ways of deciding whether or not classifiers have a semantic function (i.e., denote certain perceived characteristics of the thing to which the associated noun refers).   One is to use the intuition of native informants, suspect though it may be.   A second is to use a foreign observer's intuition about the nature of the noun classes revealed by classifiers — suspect though that may be.   A   third, more performance-oriented method, is to introduce new words and objects to a number of native speakers and see what classifiers they use with them.   To these three I would add a fourth: To observe speech errors involving classifiers and see to what extent the slips reveal systematic correspondences with category boundaries.   For example:

Ex. 105. "我 有 一 篇... 我 有 一 封 信..."
"Wǒ yǒu yì piān... wǒ yǒu yì fēng xìn..." ("I have a letter...")

If this example is indeed a slip (and not merely due to the speaker's indecision as to whether the document in question was an article or a letter), then it constitutes evidence for the non-arbitrary and psychologically salient nature of classifiers.

Another related question about classifiers is: To what extent are they productive? (This is related to Allen's third method above.) To what extent do Chinese speakers creatively apply and extend classifiers in novel situations, jokes, science-fiction tales, counterfactual scenarios, etc.? (At an ice cream store, I once playfully referred to a scoop of ice cream in a cone as "一 朵 冰 淇 淋" — the character 朵 (duǒ) being the measure for such things as clouds and flowers — and got a bemused smile out of my Chinese friend.) As at least one set of researchers (Hofstadter & Moser, 1989) has noted, the distinction between an error and a creative extension of the language is often a fine one, and both errors and creative usages are most likely to occur in those linguistic situations where the capabilities of the language and the cognitive resources of the speaker are pushed somewhat.

4.4. The kinds of speech pathologies seen in aphasics and patients with other types of brain damage have long been used in conjunction with evidence from errors committed by normal people in order to piece together a coherent view of lexical retrieval and other phenomena (Aitchison, 1987). In addition, linguistic pathologies of Japanese aphasics and stroke victims have been of great interest to researchers interested in the processing differences between phonetic scripts like English and logographic scripts such as Chinese. (See, for example, Paradis et al, 1985.) The reason Japanese is considered a good testing ground for such issues is that the language uses both a phonetic syllabary (the *hiragana* and *katakana* characters) and Chinese characters (called *kanji*), and thus shares features of both English and Chinese. Among the interesting results of clinical studies in this area is that most often the ability to read the phonetic *katakana* and *hiragana* script is more severely affected than the ability to read *kanji* characters, and this is thought to have significant implications for the study of processing differences between different kinds of scripts (Paradis et al, 1985, and Hung & Tzeng, 1981).

Many studies have been done on the extent of phonetic speech recoding in Chinese and English (e.g. Treiman, Baron, & Luk, 1981, and Chu-Chang & Loritz, 1977). There is much fascinating evidence on this issue, some of it contradictory and confusing, but there is general

agreement that Chinese readers do employ a speech recoding strategy in reading, though not to the extent that readers of English do. (See Hung & Tzeng, 1981, for an excellent overview of research in this area.)

Errors in writing and in reading out loud might perhaps be used to expand and supplement the corpus of evidence in these two domains. There is already some work in the field of error-making that addresses low-level neurolinguistic aspects of speech errors (e.g. Laver, 1980), and such work can no doubt be incorporated into work on aphasia and other speech-related brain disorders. The combining of error research with these two areas — clinical research on speech pathology and investigations of the reading processes of normal language users — might prove very fruitful, since behavior observed in linguistic errors has the advantage of being poised somewhere in between "business-as-usual" linguistic performance and pathological functioning.

Words of Thanks

I wish to thank Liu Haoming (刘皓明) of Indiana University for his help in collecting and analyzing various materials. Most of the Chinese error-category terms are due to him. I also wish to thank Yan Yong (严勇) at Stanford University for several error examples and much advice. Thanks to Zi Minyun (资民筠) of Peking University, who sent me many error examples and helpful comments. I am grateful to Victor Mair at the University of Pennsylvania for very cogent comments and suggestions on the first draft of the paper. As usual, special thanks to Douglas Hofstadter for a constant supply of inspiration and guidance, and for providing an ideal working environment.

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