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Speech Errors: An Integrated Study from Phonological, Lexical, and Syntactic Perspectives (1/2)

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國立政治大學研究團隊整合型計畫
研究規劃成果精簡報告

研究團隊主題：<u>Speech Errors: An Integrated Study from Phonological,</u>

<u>Lexical, and Syntactic Perspectives (1/2)</u>

<u>語誤：音韻、詞彙與句法之整體研究(1/2)</u>

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研究團隊

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總計畫	何萬順	語言學研究所	教授	Speech Errors: An Integrated Study from Phonological, Lexical, and Syntactic Perspectives
子計畫一	萬依萍	語言學研究所	副教授	Phonetic and phonological analysis of speech errors
子計畫二	1.張郇慧 2.Dr. Rainer Stasiewski	1.英國語文學系 2. Chinese Dept., Srinakharinwirot University	1.副教授 2.副教授	Lexical and semantic analysis of speech errors
子計畫三	何萬順	語言學研究所	教授	Morphological and syntactic analysis of speech errors

1. INTRODUCTION

Speech errors, also known as slips of the tongue (SOT), are defined as one-time errors occurring during speech production planning. A speech error is such because the utterance produced is in fact different from what is intended. Speakers of all languages seem to be subject to speech errors. The great psychologist Sigmund Freud discovered the significance of speech errors as early as 1901 in the monograph *Psychopathology of Everyday* life, where he claimed that the particular slips of the tongue a speaker makes are resulted from repressed thoughts and thus that there is presumed an unconscious determinant of each error. Slips of the tongue thus represent windows through which such repressed thoughts are revealed. Given the Chomskyan thesis that language is very much part of human cognitive knowledge and is indeed what makes humans uniquely human, then Freud is correct in the broad sense and hence every speech error is a 'Freudian slip'[1] in that it reveals something of the unconscious mind, to which our *tacit* knowledge of language belongs. It is precisely the links between speech errors and this tacit knowledge this research project wishes to explore, from the particular perspectives in Mandarin Chinese.

The development of speech production planning models has a long history of using speech errors in examining various issues in linguistic theories and the cognitive status of specific linguistic units and processes in specific languages; speech errors thus constitute invaluable evidence for the study of theoretical linguistics as well as psycholinguistics (Fromkin 1973b, 1980, Dell 1980, Cutler 1982b, Stemberger 1983, Garrett 1988, Levelt 1989, Baars 1992, among others). This current research project proposed, which is squarely based on the rationale above, examines a wide range of Mandarin speech error data from normal adults and aphasics and explores their implications to our current understanding of the theories on phonology, lexicon, meaning, syntax, and perhaps even the pragmatics. It is our understanding that no such research projects have been undertaken thus far concerning Mandarin Chinese.

2. CATEGORIZATION OF SPEECH ERRORS

Given the modules assumed in the modern science of language, the linguistic difference between the intended and produced utterances can be related to phonological units, lexical choice, syntactic structure, and semantic connections. Through a thorough study of four types of speech errors, Garrett (1980, 1984, 1988) concludes that language

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1 A Freudian slip as a layman's term is typically an error that reveals something sexually-oriented. For example, to a woman who wanted to reschedule a dinner date with a man, he says, "I hope this is not an erection", meaning to say "rejection".

production involves the following levels of processing. The initial stage is the message level, where the speaker determines what ideas are to be expressed, followed by the functional level, where appropriate lexical items are identified for the expression of the ideas already determine. Then, at the positional level, these lexical items selected are arranged into well-formed syntactic structures, and then, at the final stage of production, phonological forms are assigned to the syntactic structured previously constructed.

The four types of speech errors are: semantic substitutions, word exchanges, sound exchanges, and stranding errors. Some examples follow. A semantic substitution error is one where the intended word is replaced by another word that is semantically closely related. For example, the is intended idea of 男生 'boy' is substituted by 女生 'girl'. Such errors can thus only involve content words, i.e., words with semantic content, but not function words, which, by definition, fulfill a grammatical function but are without semantic content. Word exchanges involve the inversion of two lexical items, or their sub-parts, in a clause. Such errors likewise involve only content words, not function words. For example, the intended 採蘑菇的小女孩 'the little girl that picks mushrooms' becomes 採女孩的小蘑菇 'the little mushroom that picks girls'. An example of sound exchange is *bu4pu4* 布瀑, where the [*b*] sound and [*p*] sound of the intended *pu4bu4* 瀑布 have been exchanged. Finally, a stranding error leaves a subpart of a word, usually a formative such as prefix or suffix, stranded, for example the intended *sinking ships* that turns into *shinking sips* and 買菜啊，二舅！ that becomes out 買舅啊，二菜！An error can of course involve more than type of error.

Finer distinctions can also be made within each module of phonology, semantics, syntax, and pragmatics. Moreover, the linear relationship between the error and source, i.e., directionality of the error, also serves as a significant characteristic, likewise the particular substance type of an error, i.e. substitution, addition, omission, etc.

3. DATA COLLECTION AND MANDARIN SPEECH ERROR CORPUS

The current study is based on 4227 slips of the tongue from the corpus collected from native speakers of Taiwan Mandarin. The data are derived from anecdotal observations, various sources on the Internet, previously published works on the subject, and most importantly thousands of tape-recorded brief excerpts of natural speech, which contain the target unit involved in errors (i.e., those which the speaker intended to produce), the source of the error (i.e., those units which were the interfering factor in the error), and the error itself (i.e., the units in the utterance production which violated the speaker's intentions). These excerpts were taken from free conversation, conference discussions, broadcasts, lectures and from interviews with students. For each error, the researcher recorded the complete utterance including self-corrections, and relevant

contextual information; portions are written in IPA phonetic transcription as appropriate. Thus SOTs will be reported below in terms of the actual pronunciations subjects produced during the error utterance.

Errors were collected from over 100 different speakers. Subjects ranged from monolingual to trilingual, with Mandarin as their first language and English and Taiwanese as their other language(s) if any. However, all the errors were collected when the speakers were conversing in Mandarin; any errors which showed a bilingual influence were not included in the data set. One might argue that obtaining the slips data under naturalistic conditions does not have the overriding advantage of giving insight into the psychological structures and processes actually used by native speakers in the generation of speech. Even if evidence may be derived from psychological constructs, it is not always clear at which level of analysis the speakers operate on. In addition, the traditional methodology in collecting speech error data is to rely on the native-speaker linguist's intuitions as to what categories in the native language were heard by the native listener (Fromkin 1973a). This method is subject to a certain listener bias (Cutler 1982b). In order to eliminate the context-effect applying in naturalistic speech performance, Dell & Reich (1980) and Stemberger (1985) conducted a number of experiments, trying to reduce all anticipated potential distortions that might render evidential value of the slips ambiguous. Furthermore, Mowrey & MacKay (1990) found that in speech errors induced in the laboratory by having speakers repeat 'tongue twisters' several times in succession, some phonetic differences between erroneously produced and intentionally produced consonants could be detected using electromyography. However, Stemberger (1989) gathered naturalistic corpus to examine some issues related to speech errors in early child language production, suggesting that there should not be great differences between an experimentally elicited corpus and a natural/spontaneous corpus. In addition, Fromkin (1973b, 1980) suggested that speech errors collected in a naturalistic setting have a cognitive validity in terms of the representation of speakers' minds during processing. Therefore, in order to prove that the perception by a native speaker that a segment was spoken with a particular sound is a more valid psycholinguistic measure than the actual phonetic properties of the utterance, Wan (1999, 2003) and Wan & Jaeger (2003) subjected several instances of erroneously produced sounds and the same sounds produced intentionally in the same environments in order to formant value analysis. It was found that there are no significant differences in analysis between the erroneously produced sounds and the same sounds produced intentionally in the same environment. Therefore, the slips collected in a naturalistic setting for this study will be taken as evidence reflecting psychological constructs in the language structure, and the data to be discussed below are thus sufficiently reliable to provide matter for analyses.

After data collection and categorization, the study contained 3846 categorized errors, 216 non-contextual errors, 156 ambiguous (multiple) errors, and 9 bilingual errors for a total of 4227 tokens. Another 24 miscellaneous utterances, which are not presented under the study, included ones where the subjects restarted utterance or created ungrammatical sentences that were judged not to be speech errors. The number of each type of error in the Mandarin corpus is shown in Table 1 at the end of the text.

TABLE 1
The number of each type of error in this corpus: N=4227

I. PERSEVERATION	N	IV. EXCHANGE	N
1. Initial single consonant substitution	225	39. Initial single consonant	9
2. Initial single consonant addition	78	40. Final single consonant	15
3. Initial single consonant omission	45	41. Vowel and glide	3
4. Final single consonant substitution	138	42. Larger unit	3
5. Final single consonant addition	45	43. Whole syllable	18
6. Final single consonant omission	12	44. Vowel-consonant exchange	3
7. Single vowel substitution	54	Total	51
8. Single vowel addition	12	**V. NON-CONTEXTUAL ERRORS**	
9. Single vowel omission	12	45. Initial single consonant substitution	90
10. Vowel and glide substitution	48	46. Initial single consonant addition	12
11. Vowel and glide addition	15	47. Initial single consonant omission	24
12. Vowel and glide omission	3	48. Final single consonant substitution	27
13. Larger unit substitution	123	49. Final single consonant addition	3
14. Larger unit omission	6	50. Final single consonant omission	6
15. Whole syllable substitution	57	51. Single vowel substitution	12
Total	873	52. Larger unit substitution	36
II. ANTICIPATION		53. Whole syllable substitution	6
16. Initial single consonant substitution	150	Total	216
17. Initial single consonant addition	30	**VI. OTHER PHONOLOGICAL ERRORS**	
18. Initial single consonant omission	24	54. Feature	90
19. Final single consonant substitution	78	55. Telescoping	123
20. Final single consonant addition	51	56. Multiple	156
21. Final single consonant omission	21	57. Vowel and glide interaction	114
22. Single vowel substitution	60	Total	483
23. Single vowel omission	15	**VII. TONAL ERRORS**	
24. Vowel and glide substitution	27	58. Perseveration substitution	183
25. Vowel and glide addition	9	59. Anticipation substitution	99
26. Vowel and glide omission	3	60. Anticipation/Perseveration	48
27. Larger unit substitution	75	61. Exchange	21
28. Larger unit omission	6	62. Addition/Anticipation	6
29. Whole syllable substitution	81	63. Non-contextual	39
Total	630	Total	396
III. ANTICIPATION/ PERSEVERATION		**VIII. LEXICAL/MORPHOLOGICAL ERRORS**	
30. Initial single consonant substitution	24	64. Word blends	66
31. Initial single consonant addition	18	65. Lexical substitution	1179
32. Initial single consonant omission	21	66. Lexical omission	42
33. Final single consonant substitution	21	67. Syntagmatic ordering	66
34. Final single consonant addition	21	68. Morphological errors	27
35. Final single consonant omission	6	69. Lexical exchange	21
36. Single vowel substitution	15	Total	1401
37. Vowel and glide substitution	6	**IX. SYNTACTIC ERRORS**	27
38. Larger unit substitution	9	**X. BILINGUAL ERRORS**	9
Total	141		

The errors are classified according to the following four criteria: these error units broadly classified into phonological, lexical/morphological, syntactic and bilingual categories; the linear relationship between the error and source (i.e., directionality of the error); the type of error (substitution, addition, omission, etc.); and the position in the syllable in which the error occurred for phonological errors.

Errors are classified as 'phonological' if non-meaningful phonological units are involved: phonetic features, single consonants or vowels, clusters of segments (including consonants clusters, rhymes, etc.), whole syllables, and tones. Errors are classified as 'lexical/ morphological' if one lexical/morphological item is involved in the utterance, and it is clearly a lexical/morphological rather than phonological error. Usually, true lexical errors can be distinguished from phonological errors in that lexical errors nearly always preserve lexical category, and are usually semantically related to the intended word; a phonological relationship is less common. Phonological errors, on the other hand, frequently violate lexical category and have no semantic relationship to the target word; thus they typically produce an ungrammatical or meaningless utterance. Errors are classified as 'syntactic' if a whole word or compounds are moved and the word order is thus changed; both target and interfering units are in the discourse context. Errors are classified as 'bilingual' if the error is the result of interference from a language (other than the one being spoken) in which the speaker is fluent or of which he or she has significant knowledge. In the corpus, the error output involved units influenced by English or Taiwanese.

4. TENTATIVE FINDINGS

Evidence from a corpus of speech errors in Mandarin occurring in naturalistic settings support the following findings. Corpus analysis in Mandarin shows that the speech mechanisms in regard to types of error and classification are universal; however, the causes of error are language-specific.

Regarding the occurrence at any stage of the speech production planning process, phonological errors are the major types of error distribution (64.3%). Regarding phonological units occurring in errors, in the Mandarin corpus, it can be seen that speakers produced more consonant errors than vowel errors. Cross-linguistically, consonants outnumber vowels both in terms of number of phonemes in the segment inventory and in the ratio of consonants to vowels within utterances. Phonological substitution errors far outnumber any other type of error. Based on the autosegment- and optimality-theoretical approach to phonology, it can be predicted that substitution errors will occur more frequently than other types. Similarly, the faithfulness constraint in

optimality theory requires that every segment or feature of the phonological input has an identical correspondent in the output. Accordingly, if one segment in the input is replaced by another, this only violates segmental faithfulness constraint. Evidence from the Mandarin slips finally shows the preponderance of a one-syllable span in the distance between source and error. Although a number of models of speech production planning (e.g., Garrett 1980, 1984, 1988, Levelt 1989, etc.) predict that the speech is planned far ahead in clausal units and there is a building of syntactic structures in advance, the source segment that influences the production of the error is usually within the utterance context; furthermore, the source and error unit are likely to occur in near proximity and the distance between the source and error can be measured in syllables, suggesting that syllable can be regarded as an important unit in the phonemic programming system.

5. TOWARDS AN INTEGRATED RESEARCH PROJECT

Having started on the actual data collection and achieved close to 5,000 speech errors, the researchers involved are confident that they are on the right track. In the second stage of the project period, data collection will be continued. Furthermore, the errors are to be examined more closely and classified into fined categories with more detailed tagging. In short, a model of speech error corpus that is statistically adequate will be constructed.

The second task is to conduct pilot studies, using small samples of speech error data, and examine their causes and identity the particular language production stage where such errors occur. The ultimate goal is to build an inventory for all errors in the corpus. The ultimate goal is a statistically adequate and well-structure corpus of Mandarin speech errors.

Also an important task during this second phase is the establishment of different scenarios how findings from speech error data can contribute to (i.e., verify, modify, or reject) current theories of phonology, lexicon, meaning, syntax, and perhaps even the pragmatics. The division of labor will be more finely defined in this second stage. Each sub-project will focus more on its specialized.

Finally, possible medical and pedagogical implications will also be explored. For this, more cooperation, especially from clinically-oriented medical practicians and speech therapists, will be needed.

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