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AN ABSTRACT OF THE THESIS OF Minglang Zhou for the Master of Arts in English: TESOL presented June 15, 1988.

Title: Script Effects and Reading Strategies: Ideographic Language Readers VS. Alphabetic Language Readers in ESL.

APPROVED BY MEMBERS OF THE THESIS COMMITTEE:

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The purpose of this study was to examine script effects of the Chinese Language on Chinese ESL/EFL students' reading strategies, in comparison to those employed by ESL students from alphabetic orthographic backgrounds.

Chinese ESL/EFL students read very slowly in English. Regarding their

reading problems, one assumption is that when reading English as a second/foreign language, they may have difficulty in adjusting their cognitive approaches to the print and their reading strategies, because a main difference between Chinese and English lies in the orthographies: ideographic script of Chinese and alphabetic script of English, in addition to linguistic differences between the two languages.

From the point of view of neuropsychology, these two scripts are supposedly processed in different ways by the readers. Clinical and experimental evidence shows that ideographic script is more likely to be processed visually and holistically in the right hemisphere, whereas alphabetic script is more likely to be processed acoustically and analytically in the right hemisphere.

In this causal-comparative study, three subjects from each of the following orthographic and linguistic populations were used respectively: educated native speakers of Chinese who were American university students; educated native speakers of Spanish who were American university students; and mono-literate American-Chinese college students whose first oral language was Chinese but first written language was English. The total number of subjects were nine.

The major measurement adopted in this study was Reading Miscue Inventory. It was modified to reflect Chomsky and Halle's theoretical assumptions and Venezky's empirical assumptions that English has an abstract phonological representation which is mapped at an intermediate level with graphic units instead of single letters. The other measurements were a questionnaire for assessing the subjects' orthographic, linguistic

and educational backgrounds, and the measuring of miscue responses to unfamiliar words in the text.

It was hypothesized that the Chinese readers might rely more on graphic cues and less on phonological cues than Spanish and English readers, and their responses to unfamiliar words would be more often miscues than the Spanish and English readers', if they read English in the way they read Chinese. Graphic cues were defined as graphic similarity and phonological cues were defined as phonological similarity, as measured by Reading Miscue Inventory.

Findings from this study indicated that the Chinese readers relied more on graphic cues, reading word by word for graphic, phonological, and semantic information in a simple bottom-up process without enough contextual predictions. Contrary to the hypothesis, research results showed that the Chinese readers were also reliant on phonological cues, but they were unskilled users of such cues, spending longer time in retrieving phonological representations, making more miscue responses to unfamiliar words and having difficulty mapping graphic information to phonological representations at the abstract level.

SCRIPT EFFECTS AND READING STRATEGIES: IDEOGRAPHIC LANGUAGE
READERS VS. ALPHABETIC LANGUAGE READERS IN ESL

by
MINGLANG ZHOU

A thesis submitted in partial fulfillment of the
requirements for the degree of

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Portland State University

1988

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Minglang Zhou

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CHAPTER I

INTRODUCTION

The purpose of this study is to examine the script effects of Chinese on reading strategies employed by Chinese ESL/EFL students, ideographic language readers, in comparison with those employed by alphabetic language readers, ESL students who are literate in Spanish, and by mono-literate American-Chinese students whose first oral language is Chinese, but whose first written language is English.

THE BACKGROUND FOR THIS STUDY

More and more Chinese students are now studying English, which is the most popular foreign language in China. At the same time, the population of Chinese students at American universities is rapidly growing. These students have brought some new problems for the ESL teachers here, because they come from a different cultural and linguistic background. Among many problems ESL students are expected to have in their studies, the Chinese ESL/EFL students' slow reading, for example, is of particular interest to ESL teachers. Many Chinese ESL/EFL students can not reach the required score on TOEFL or other placement tests, and can not finish their reading assignments, at least partly because they read much slower than required or

expected.

It has long been noticed that bilinguals, whether second language readers or foreign language readers, generally do not read as skillfully as they do in their first language or native language. A common explanation for this reading problem, as proposed by Alderson (1984), is that second language or foreign language readers lack some of the basic linguistic knowledge necessary for skilled reading or may not have good command of the vocabulary and syntax of the target language, the stylistic conventions of paragraph structure or the cultural assumptions underlying the text in question.

Where Chinese ESL/EFL students' reading is concerned, Field (1984) makes two assumptions: first, socio-cultural factors influence their reading speed, and second, adjustments in the switch from reading an ideographic language to an alphabetic language make reading in an alphabetic language difficult. The major socio-cultural factors are the Chinese attitudes toward written language and literature, and the traditional approach to reading and to teaching reading, as pointed out by Field (1984). Literature selected for a reading text is considered by Chinese not only as a good sample of written language, but also a good example of the author's personal cultivation, that is , his or her education, virtues and integrity, as expressed in the text. The text is a moral lesson expressed in the most appropriate language. Under this assumption, the text is analysed word by word, sentence by sentence, and paragraph by paragraph in reading class, while students are required to memorize the text and to recite it. This approach is also employed in English classrooms to a certain degree. As a result, there are intensive reading and extensive reading

classes. The former is more like a traditional Chinese language class, whereas the latter is a compromise between the traditional Chinese approach and Western approaches, such as reading fast primarily for information.

These socio-cultural factors may influence Chinese ESL/EFL students to a certain degree, but it is not certain that they cause the main problems in Chinese ESL/EFL students' reading. Such factors have shaped Chinese attitudes toward reading and approaches to teaching reading in English, but to an even greater degree, they have shaped Chinese attitudes toward reading and approaches to teaching reading in Chinese, the native language. Though Chinese ESL/EFL students are slow readers in English, there is no evidence, at present, that educated Chinese are slow readers in their native language, compared with their counterparts in other languages, such as English.

The second assumption that Chinese ESL/EFL students have difficulty in adjusting in the shift from reading an ideographic language to an alphabetic language may be more relevant to their reading problems in English. It deserves greater attention in the study of Chinese ESL/EFL students' problems in reading. Alderson (1984) has offered two hypotheses for weaker second language reading: (1) the poor second language reading is caused by inappropriate reading strategies, different from those employed in native language reading; and (2) It is caused by insufficient knowledge of the target language and consequent inability to employ good first language strategies. In short, the focus in his hypotheses is whether the second language reader is able to make use of linguistic knowledge appropriately or not. In these hypotheses, Alderson is talking about reading

in a second language in general. For Chinese ESL/EFL students, one of the main differences between Chinese and English lies in the orthographies of the two languages, ideographic script of Chinese and alphabetic script of English, in addition to linguistic differences between the two languages.

The script of Chinese is ideographic in general. However, there is some disagreement on the categorization of Chinese characters. Zhangjin (1986, p.45-46) put Chinese ideograms into four categories: (1) pictographs; (2) simple ideograms; (3) complex ideograms; and (4) phonograms. Henderson (1982, p.17) grouped Chinese characters into five categories: (1) pictographs; (2) ideographs; (3) compound ideographs; (4) phonetic loans; and (5) phonetic compounds, while Wang (1981, p.232) divided characters into six categories: (1) pictographs; (2) simple ideograms; (3) complex ideograms; (4) phonetic loan; (5) phonograms; and (6) derivatives. In this study, Chinese characters are described according to Zhang's categorization, because the structure of Chinese characters and its relationship with sound and meaning are concerned in this study. Generally speaking, phonetic loans and derivatives fall into Zhang's four categorizations, if the structure and its relationship with sound and meaning are examined.

Pictographs have developed from pictures. For example, the word "日" (sun) comes from "日" and "日". Simple ideograms consist of pictographs and conceptual symbols. For instance, "刃" (blade) is made of a pictograph "刀" (knife) and a point at the blade side of the knife. Complex ideograms consist of two pictographs or simple ideograms. Take "明" (bright) for example, it consists of "日" (sun) and "月" (moon). The phonograms consist of a semantic clue, a radical or a basic character, and a phonological clue, a basic character. More than 90% of commonly used

characters are phonograms. However, this does not mean that Chinese is a phonetic language, because of the complex configurations of phonograms and the historical phonological changes.

The configurations of phonograms mainly fall into six categories: (1) phonological clue on the left and semantic clue on the right and (2) vice versa; (3) phonological clue on the top and semantic clue on the bottom and (4) vice versa; and (5) phonological clue inside and semantic clue outside and (6) vice versa. Such configurations are bidirectional so that they actually do not provide rules to follow.

In the last two thousand years or so, phonological changes have taken place in both vowels and consonants. For example, the [p] sound in some phonological clues has changed to a [f] sound, or has not changed at all in other phonological clues. As a result, phonological clues do not function as accurate clues any more. According to some investigations (Zhang, 1986, p.51), only 15% of the phonograms keep phonological configurations that match the morphemes, if the tone is not considered. When the tone is taken into consideration, only 5% of the phonograms keep their original unity of tones, phonemes and morphemes.

From the point of view of neuropsychology, ideographic and alphabetic scripts are supposedly processed in different ways by the reader. Some clinical and experimental evidence (Turnage et al, 1973; Sasanuma, 1975; Naeser, 1980; Henderson, 1982; Vald, 1983) shows that ideographic script, like Chinese characters, is more likely to be processed visually and holistically in the right hemisphere, whereas alphabetic script, like English, is more likely to be processed acoustically and analytically in the left hemisphere. Though some linguists and psychologists (Hasuike, Tzeng, and

Hung, 1986) are critical of such evidence, the scripts of Chinese and English are so different that they are highly likely to have certain effects, linguistically or psychologically, on their readers.

Research along this line has generally been clinical and experimental, confined to laboratories. Clinical research with brain damaged patients casts some doubt as to whether findings gained from such patients can be applied to normal people, while findings gained from laboratory experiments are challenged because of theoretical or methodological problems. Considering this situation, it was believed that a comparative study of script effects on reading strategies employed by ESL students from contrasting orthographic and linguistic backgrounds might provide new evidence to the problem of script effects from a different aspect, and most important of all, might also provide some insights into the reading problems Chinese ESL/EFL students have in their studies.

STATEMENT OF RESEARCH HYPOTHESES

Reading is a universal process (Goodman, 1970, 1976). Research evidence in Spanish, German, Polish, etc. shows that second language learners transfer their first language reading skills to the reading of a second language, especially when they are advanced readers in the second language. Based on the clinical and experimental evidence that ideographic script, like Chinese characters, is processed visually and holistically, and alphabetic script, like Spanish and English, is processed acoustically and analytically, there should be differences in the reading strategies employed by ideographic language readers and alphabetic language readers when they

read English as a second language or a foreign language. If they read English in the way they read Chinese;

(1) ideographic language readers, namely, Chinese ESL/EFL students are expected to rely more on graphic cues than alphabetic language readers; graphic cues are defined as graphic similarity measured as miscues by Reading Miscue Inventory (Goodman and Burke, 1972);

(2) ideographic language readers are expected to rely less on phonological cues than alphabetic language readers; phonological cues are defined as sound similarity measured as miscues by Reading Miscue Inventory.

(3) ideographic language readers' responses to unfamiliar words in the reading passage are expected to be more often reading miscues than are alphabetic language readers' responses.

Although they are native speakers of Chinese, mono-literate American-Chinese students who are nonliterate or semi-literate in Chinese, are considered alphabetic language readers, because their first written language is English. Their first oral language, Chinese, apparently exerts no script effects on their reading in English, since script effects are cognitive functions developed in the process of reading an ideographic language.

DEFINITION OF TWO KEY TERMS

At least three terms, ideograph, pictograph and logograph, are proposed by linguists to describe Chinese. These terms, according to Henderson (1982, p. 8), " have sometimes been used in overlapping and

sometimes in exclusive senses". To avoid confusion, the term, ideograph, is used to refer to Chinese language in general in this study,

In this study, script effects, the effects of ideographic scripts on ~~*~~ cognitive approach to the print, are defined as cognitive functions with greater right hemisphere activity in processing ideographs at the neuropsychological level (Hasuik et al, 1986). Such functions take a more holistic and visual approach to the processing of ideograms in the right hemisphere.

In conclusion, the purpose of this study is to examine script effects of Chinese ideograms on Chinese ESL/EFL students in comparison with students from alphabetic orthographic backgrounds. The problem arises from Chinese students' particularly slow reading in English. Concerning this problem, one assumption is that Chinese students' reading speed is slowed down by difficult adjustment in the switch from reading an ideographic language to an alphabetic language. This study focuses on this assumption, approaching it from the perspective of script effects that are considered cognitive functions with greater right hemispheric activities, hypothesizing that Chinese readers are more reliant on graphic cues than phonological cues, compared with alphabetic language readers.

CHAPTER II

REVIEW OF RELATED LITERATURE

Literature on three areas of studies, that is, cerebral dominance, script effects and reading theories, is reviewed in this study. The review of literature on cerebral dominance serves as a background so that the review of literature on script effects can be presented meaningfully. The review of literature on reading theories provides a theoretical framework within which the influence of script effects on reading strategies is examined and measured in this study.

CEREBRAL DOMINANCE

Script effects are cognitive functions with greater right hemispheric activities. When functions and activities involve hemispheres, it is necessary to discuss cerebral dominance for the purpose of providing an overall picture, since it is generally believed that different hemispheres are dominant for different cerebral functions.

Marc Dax read a paper at Montpellier in 1836, revealing his discovery that paralysis of the right side of the body was usually accompanied by loss of speech, whereas patients could talk normally following the paralysis of the left side of the body. In 1861, Broca found that damage to the area in

front of and just above the left ear (left frontal cortex) resulted in the disability to speak. Following these two Frenchmen, Wernicke, a German neurologist, found in 1874 that damage to the area around and under the left ear (left temporal cortex) caused problems in patients' speech comprehension. Since then, there has developed a belief that the left hemisphere was dominant because it seemed to control language in most people (Lenneberg, 1975; Aitchison, 1976; Gaddes, 1980).

The dominance of one hemisphere over the other is considered either structurally asymmetric or functionally asymmetric, or both. After these pioneering discoveries, many researchers tried to find structural differences between the two hemispheres of the brain to account for the differences in their functions. Differences in weight and complexity of the two hemispheres, in volume and length of the carotid arteries of the two hemispheres, and in the asymmetries of the two temporal lobes were found. Though some findings were too small to be of much significance, findings from the research mostly provided evidence for the dominance of the left hemisphere (Gaddes, 1980). For example, Geschwind and Levitzky (1968) found in a histological study that the planum temporale of 100 adult brains was larger on the left in 65 percent and equal on both sides in 24 percent, whereas it was larger on the right in only 11 percent. This study was supported by a histological study of brains of adults, neonates and fetuses carried out by Wada, Clarke and Hamm (1975).

On the other hand, much research directed to the asymmetries in the functions of the two hemispheres also found evidence favoring the dominance of the left hemisphere, though some research showed contradictory findings. A general functional model proposed by Levy (1973,

1974) is presented in diagrams by Hardyck (1977) in the following:

TABLE I
A GENERAL FUNCTIONAL MODEL OF HANDEDNESS

For Right-Handed		
<i>Left hemisphere</i>	<i>Right hemisphere</i>	
speech	spatial abilities	
language	nonverbal ideation	
writing		
calculation		
For Left-Handed		
<i>Left hemisphere</i>	<i>Right hemisphere</i>	
Speech	speech	spatial abilities
language	language	nonverbal ideation
writing	writing	
calculation	calculation	

In the following, related literature on the functional asymmetries concerning speech, language and writing is reviewed in detail, since this study is associated with hemispheric functions in one way or another.

THE LEFT HEMISPHERE

The evidence that human language abilities are controlled by mechanisms localized in the left hemisphere comes mainly from studies in three areas: aphasiology, dichotic listening testing and visual field testing. In addition, there is also some evidence from handedness, which favors the theory of left hemispheric dominance.

1. Clinical Studies

Evidence obtained from aphasic patients indicates that damage to the left hemisphere causes three types of disturbance of speech performance as categorized by Lenneberg (1975), namely, interference with production, interference with language knowledge and interference with vocabulary. When interference of speech is concerned, patients usually suffer from damage to the left-side frontal lobe involving Broca's area. If they are given oral questions or written questions, they can answer them appropriately by gestures such as nodding, or write short answers with their unparalyzed left hand. This suggests that their comprehension is not seriously impaired. They understand, and know what to say, but cannot say it. The production disturbance might result from inability to control the motor coordination of the speech muscles. When the speech is examined, it will be found that the structure of the speech is impaired. The impaired speech is usually characterized by telegraphic style, with open class words, such as nouns and verbs, intact but closed class words, such as articles and prepositions, missing. The impairment depends on the degree of damage to the hemisphere. Consequently, these patients have difficulty in producing a coherent speech (Lenneberg, 1975; Luria, 1975; Zurif & Caramazza, 1976).

When patients suffer from damage to the left-side parieto-temporal region involving the Wernicke's area, they have disturbance in some cognitive aspect of language capability (anosognosia). They are usually unable to read and write, though they do not have problems in motor coordination of the muscles involved. Their motor coordination is intact because they are voluble, producing an uninteruptible flow of words. However, the speech is full of incorrect word-like segments that can be categorized into two types; paraphasias and neologisms. In the former situation, the patient utters segments that may be phonemically or semantically directed to the target word, while in the latter situation the patient's utterance is completely unrecognizable. The grammatical structure of the speech is monotonous. Phrases and sentences seem to be constructed in unusual ways (Lenneberg, 1975; Luria, 1975; Zurif and Caramazza, 1976)

Patients with damage to the left-side cortex outside the primary projection areas appear to be short of words in spontaneous speech (anomia). If the damage is not severe, they speak relatively fluently, though their speech is often interrupted by the tip-of-tongue phenomenon. They stop here and there in their speech for words. When comprehension is concerned, patients of this type can answer yes-no questions and follow commands without much difficulty (Lenneberg, 1975; Zurif and Caramazza, 1976).

The above evidence regarding aphasic patients' symptoms, location of injury and structure of speech supports the belief that language functions are localized in the left hemisphere.

2. Dichotic Listening

One of the experiments commonly employed to explore the relationship between the two hemispheres is dichotic listening, an auditory task. The advantage of this technique is that it can be applied to both normal people and patients with brain damage. In dichotic listening procedures a list of auditory stimuli is presented in such a way that some stimuli reach the left ear (right hemisphere), while other stimuli come to the right ear (left hemisphere). Under normal conditions, such stimuli reaching the ears travel along contralateral and ipsilateral pathways to the cortex. However, because the contralateral pathways are dominant over the ipsilateral pathways, information travelling along the contralateral pathways blocks information travelling along the ipsilateral pathways. Consequently, right-ear information has direct access to the left auditory cortex, whereas left-ear information has to travel to the right hemisphere and pass transcallosally before it can be processed by the left hemisphere (Krashen, 1976; Bryden, 1982).

In 1961, Kimura conducted two dichotic listening studies. In the first study (1961a), she presented a list of stimuli of three-digit groups to subjects, and found a right-ear superiority (hence, RES) in recalling performance. In her second study of a group of normal young adult females (1961b), Kimura found that these normal subjects also showed a significant RES. Following her, many researchers replicated the dichotic listening test with verbal stimuli, ranging from nonsense syllables to meaningful words. Findings from these studies generally support Kimura's finding.

Curry (1967) presented both meaningful words and nonsense words dichotically to subjects. Both meaningful words and nonsense words

produced a RES, though the nonsense words lacked meaning. This study suggests that the left hemisphere is not only specialized in processing linguistically meaningful stimuli, but also in processing stimuli characteristic of linguistic stimuli's acoustic features at the phonological level. Curry's study was confirmed by Studdert-Kennedy and Shankweiler's study (1970). They presented only one single pair of consonant-vowel-consonant (CVC) on each trial. Each of the CVC syllables consisted of an initial and terminal stop consonant and a medial vowel. The pairs were presented in such a way that the effect of initial and terminal consonants was examined. When reporting both consonants or vowels in their order, all subjects showed a RES for initial stop consonants, but showed a weaker RES for the terminal consonants. The vowels, in contrast, were less consistent in their ear superiority. Dawin (1971), Allard and Scott (1975) reported a RES for fricative consonants. Haggard (1971) reported a RES for liquid consonants and semivowels. However, the RES for these sounds was not as great as that for the stop consonants in Studdert-Kennedy and Shankweiler's research. Moreover, the RES for vowels was small. It might result from the nature of the task. In Godfrey's study (1979), vowels produced a more significant RES when noise was added and the length of stimuli was shortened. This implies that RES is greater when the task is more difficult. These dichotic listening studies indicate, at least, that the mechanisms for processing phonetic structure of language are localized in the left hemisphere.

3. Visual Field Testing

Another commonly adopted technique in exploring the functions of the

two hemispheres is visual field testing. In the visual nervous system, it is not as simple as it is in the auditory system in which the left-ear information travels along fibers to the right hemisphere and the right-ear information to the left hemisphere. The visual nervous system is more complex. The left half of both retinae of the eyes sends information along the nervous fibers to the left visual cortex, while the right half of both retinae sends information to the right visual cortex. However, the optical lenses of the eyes are reversed, and the image of an object on the right is projected to the left of each retina and vice versa. As a result, the image of objects on the right visual field is sent to the left hemisphere, and on the left visual field to the right hemisphere (Gaddes, 1980. Bryden, 1982.).

Heron (1957) used single letters and groups of letters in visual field studies. He found that left-visual-field superiority (hence, LVFS) appeared if a row of letters was centered at fixation and spread into both visual fields. However, he found a right-visual-field superiority (hence, RVFS) when single letters or group of letters were exposed in only one visual field at a time. Heron believed that the theory of serial process of alphabetic stimuli could account for these effects. Bryden (1965) used single letters in a visual field study with left-handers and right-handers. The finding from this research is consistent with the speculation that right-handers have left hemispheric language dominance, while left-handers have right hemispheric language dominance. Right-handers showed a RVFS, whereas left-handers did not in this study.

In addition to the above unilateral studies with letters, some researchers employed words as stimuli in bilateral presentation in their research. For instance, Hines (1976) achieved a more significant RVFS with

bilateral presentation of word stimuli than with unilateral presentation. This finding confirmed similar findings from an earlier study by Kershner and Jeng (1972). RVFS obtained in bilateral presentation (presented to the right visual field of both eyes) is believed to be more robust than that obtained in unilateral presentation. The rationale, according to Hines (1975), is that the more specialized hemisphere will always carry out the task in unilateral presentation of stimuli, while the presence of bilateral presentation of stimuli in both visual fields inhibits interhemispheric communication so that the capacity of each hemisphere is better assessed.

Following the unilateral and bilateral procedures, studies with the manipulation of tasks, such as name matching task (Posner and Keele, 1967) and memory-name matching tasks (Klatzky and Atkinson, 1971), were conducted to fully explore VFS. The findings from these studies were inconsistent with the nature of the stimuli presented. It is probably the nature of the task involved, but not the nature of the stimuli, that makes the difference. Bryden (1982) concluded that:

Right-visual-field effects do not appear simply because verbal stimuli have been used. Rather, the existence of right-visual-field effects depends on the nature of the task being performed by the subject. When the task involves language processing, a right-field effect is observed; when it does not, or when nonlanguage processes become relatively more important, no right-field effect is seen (p.64).

4. Handedness

The phenomenon that a majority of people are right-handed and a majority of people show a left-hemisphere dominance for speech has drawn researchers' interests to the relationship between handedness and speech

dominance for a long time. Evidence from clinical cases, inheritance and experiments is encouraging, though not always consistent as expected.

Bryden (1983) evaluated the data obtained from studies of both left-handers and right-handers to examine the relationship between handedness and aphasia. His evaluation indicates that 62.1% of right-handed patients with left brain injury have suffered from aphasia, while only 3% of right-handed patients with right brain injury have suffered from aphasia. This evaluation also indicates that 52.8% of left-handed patients with left brain damage have suffered from aphasia, whereas 25.1% left-handed patients with right brain damage have suffered from aphasia. The rest of both the right-handed and left-handed aphasic patients have damages on both sides. Zangwill (1967, cited in Millar and Whitaker 1983) reviewed 2133 cases of brain damage reported in the literature. The statistics obtained by both Bryden and Zangwill are highly consistent.

The relationship between handedness and family history is also of interest to researchers. Bryden (1982) reviewed four studies of handedness and family history. The result is shown in TABLE II on the next page.

It is assumed that genetic factors may determine handedness. The question is what the relationship between genetic factors and cerebral dominance is if handedness is really determined by such factors. Annett (1974), and Levy and Nagylaki (1972) developed genetic models to account for the incidence of inheritance of handedness and cerebral dominance for speech.

Moreover, the relationship between handedness and cerebral dominance for speech is investigated together with dichotic listening and visual field testing. Segalowitz and Bryden (1983) reached the conclusion that all of the

TABLE II

INCIDENCE OF LEFT-HANDED OFFSPRING AS
A FUNCTION OF PARENTAL HANDEDNESS

Parental handedness	Summary of four studies
Total number	35,638
R father / R mother	32,190
Number of left-handed	2,837
percentage of left handed	8.8%
Left father / R mother	1,813
Number of left-handed	297
Percentage of left-handed	16.4%
Right father / L mother	1,296
Number of left-handed	284
Percentage of left-handed	21.9%
L father / L mother	347
Number of left-handed	123
Percentage of left-handed	35.4%

dichotic listening studies showed that the RES was more robust in right-handers than it was in left-handers, after they evaluated several studies in this field.

In summary, the literature reviewed above on clinical studies, dichotic listening, visual field testing and handedness all provides strong evidence for the localization of major language functions in the left hemisphere.

RIGHT HEMISPHERE

In the last two decades, more and more evidence has been brought to light that the right hemisphere may possess some linguistic ability, though the left hemisphere is considered to be dominant for phonological, sequential, syntactical and referential functions of language. Literature on clinical studies with dichotic listening and visual field testing is reviewed in the following to examine the nature and characteristics of the right hemisphere's functions in processing language.

Eisenson (1962) studied 65 right-brain damaged patients with a word recognition and sentence completion test. The findings from this research indicated that right-brain damaged patients were deficient in vocabulary processing and sentence processing. This is one of the first serious claims that the right hemisphere may contribute to the language functions. Studies with right-brain damaged patients indicated that such patients had problems with the syntactic and semantic features of language. Lesser (1974) administered syntactic, semantic and phonological tests to 54 subjects of whom 15 had left brain damage, 15 right brain damage, 9 bilateral leucotomies, and 15 were controls. She found that patients with right brain damage had difficulty on the semantic test, but not so on the syntactic and phonological tests. She suggested that right brain damage might interfere with the understanding of single words, but did not interfere with the left hemisphere's syntactic interpretation of sentence and phonological processing. This was supported by a study conducted by Gainotti et al (1979). They administered an auditory comprehension test to right-brain damaged patients, and found that these patients made significantly more errors than

the controls. Schwartz et al (1979) reported a case with a marked disassociation among semantic, syntactic and phonological abilities. The patient suffered from a severe progressive deterioration in ability to deal with lexical information semantically, while the abilities to carry out syntactic and phonological tasks were mainly intact.

The visual and auditory functions of right-brain damaged patients is of particular interest. Rausch (1981) conducted a study of patients with left temporal lobectomies. She found that patients with left temporal lobectomies made significantly more false recognition errors than other subjects on semantically or acoustically related words in both auditory and visual tasks, while patients with right temporal lobectomies did not make more false recognition errors than other subjects on auditory tasks, but made significantly fewer false recognition errors than other subjects on visual tasks. This finding suggests that patients with left temporal lobectomies have an ability to encode verbal material, though they suffer a breakdown in information processing at a later stage. It also implies that the dissociation between auditory and visual modalities for right temporal lobectomy patients is due to a breakdown in the decoding of the visual attributes of verbal material. Therefore, Rausch suggested that the damaged right was more involved than the left hemisphere in the analysis of visual features of verbal material. Her assumption is supported by Jones-Gotman and Milner (1978). They found that patients with right temporal lobectomies did poorly on a paired associate learning task using concrete, high frequency words, while they did as well as normal controls on a task with abstract words. Their finding shows that patients with right temporal lobectomies are not able to employ visual imagery mnemonic devices as an aid to recall

of concrete words, because such words are highly associated with visual imagery.

Commenting on the characteristics of the visual functions of the right hemisphere, Whitelton (1983) stated that:

Its (the right hemisphere's) relatively specialized function may be described as one in which information is processed so that stimuli are synthesized or unified into a holistic percept and in which the temporal aspects of the stimuli are superceded. The perception of spatial relationships, regardless of the sensory modality involved, appears to depend mainly on this type of cognitive processing. (1983, p.119)

As a matter of fact, clinical and behavioural investigation of cognition has obtained clear evidence for right hemisphere specialization on a variety of visuospatial or holistic tasks. Carman et al (1977) reported the procedures employed to train a literal alexiac woman with left-hemisphere parietotemporal cortical atrophy and the training results. The patient was unable to translate a sequence of printed letters into the corresponding sequence of spoken phonemes because of her deficiency in the sequential abilities of the left hemisphere. After being trained to recognize words as a whole, she was able to process lexical information pictorially with the right hemisphere rather than analytically, because she could only read the words she was trained for. This evidence indicates that the right hemisphere is capable only of holistic recognition of words. This phenomenon can be explained by the finding from Zaidel's study (1977) that the right hemisphere was not capable of employing grapheme-phoneme correspondence rules to encoding visual information so that it could only read words by sight.

It has long been noticed that the right hemisphere is specialized in music. For instance, Wada (1975) found that his patient could only hum the tunes without words when asked to sing Happy Birthday after he injected sodium amytal into the patient's left carotid artery, and the patient was only able to recite the words of the song in monotone without the tunes after a right side amytal injection.

However, researchers believe that the right hemisphere may only be capable of processing acoustic features, but not capable of processing stimuli at the phonological level. For example, Weinstein (1964, cited in Millar and Whitaker, 1983) demonstrated that patients with left-brain damage had difficulty establishing the boundaries of phonetic categories, while patients with right-brain damage experienced no such difficulty. Perecman and Kellar (1981) found in a consonant-vowel discrimination task that right brain-damaged patients processed both voice and place, whereas patients with left brain-damage were only sensitive to the voice feature, but showed a decreased awareness for place. This finding indicates that the intact right hemisphere can only process voice while the left hemisphere can process both voice and place.

In a study of patients with lateralized lesions (Yen-komshian and Rao, 1980), patients with right brain damage did significantly better than left-brain damaged patients on the discrimination of stop consonants. However, there was no significant difference in vowel discrimination between left- and right-brain damaged patients, though both of them were impaired in vowel discrimination if compared with normal controls. This is supported by findings from dichotic listening testing. Several studies (Studdert-Kennedy and Shankweiler, 1970; Cutting, 1973; et al) indicated that RES

for vowels was small or inconsistent in dichotic listening. The phonetic features of vowels and consonants are acoustically different. Vowels' acoustic features may be less encoded than the consonants'. Commenting on this, Blumstein (1974) suggested that sounds such as vowels required less acoustic restructuring, and were probably less dependent on the left hemisphere for this specialized mechanism.

In conclusion, evidence from studies in aphasia cases, dichotic listening, visual field testing and handedness all indicates that major language functions, such as speech production and auditory perception, are almost completely localized in the left hemisphere. However, this does not mean that the right hemisphere is passive in language functions. Evidence from the above areas of studies, on the other hand, shows that the right hemisphere may possess abilities to process semantic aspects of linguistic materials, especially, lexical items with high imagery. This suggests that the right hemisphere may play an important role in the visual perceptual process of some linguistic materials.

SCRIPT EFFECTS

In the last one thousand years or so, Chinese characters were borrowed into Vietnam, Korea and Japan for languages that are not genetically related. Vietnam and North Korea have since replaced these characters, while South Korea and Japan still use Chinese characters supplemented with alphabetic scripts (Wang, 1981). For example, the Japanese writing system combines alphabetic and ideographic scripts: Kana, an alphabetic script, for loan words and grammatical morphemes, and Kanji,

ideographic script (Chinese characters) for lexical morphemes. Therefore, data from related Japanese literature also provide good evidence for the study of script effects. In the following, literature on script effects will be reviewed in two categories: clinical research and experimental studies.

1. Clinical Evidence

Evidence from clinical research shows that brain damage causes script-specific impairment in Chinese, in Chinese bilinguals who speak, read and write alphabetic languages, and in Japanese who use both the ideographic and alphabetic scripts.

Naeser and Chan (1980) found in a case study that a Chinese tridialectal aphasic was able to comprehend isolated Chinese characters, whereas the patient's ability in all other language modalities was impaired. April and Tse (1977) reported a case study of a right-handed bilingual Chinese aphasic patient with a lesion in the distribution of the right hemisphere middle cerebral artery. The patient was born in China and schooled in China until 7 years old. He had been in the United States for more than fifty years when he was admitted to the hospital. After he came to the United States, he spoke English at home and in his business. They found that the patient showed greater speech dysfunction for performance in Chinese than in English. The patient's English performance was better in general, and on Schuell's test in particular. They suggested that early learning of Chinese characters, the ideograms, might be critical for the establishment and maintainance of language dominance in the right hemisphere, because the ideographic script is based on visual spatial percepts. Chinese characters might present visual-spatial elements to the reader so that the reader's

recognition of characters and representation of characters might rely more on geometric spatial factors than the recognition and representation of English words do. However, in another case study of a right-handed bilingual Chinese aphasic patient with a right hemisphere lesion, April and Han (1980) reported that there was no significant preference either in Chinese or English.

Evidence from Japanese aphasic patients also supports the findings from the above case studies. In a single aphasic case study, Yamadori (1975) found that the patient could read *Kanji*, but hardly *Kana*. This phenomenon is very common. Sasanuma (1975) surveyed 378 adult aphasic patients. He found that these patients could be divided into four groups according to their symptoms and diagnosis. Patients with diagnostic, Broca's, motor, efferent motor, expressive aphasia and aphasia with sensory-motor impairment could read *Kanji* better than *Kana*. Patients with Wernicke's sensory, acoustic and receptive aphasia could also read *Kanji* better than *Kana*. Patients with simple aphasia read *Kanji* as well as *Kana*. However, patients with semantic-form aphasia or a mixed form of transcortical aphasia could not read *Kanji* as well as *Kana*. A majority of these aphasic patients had selective impairment of *Kana* reading. Such evidence indicates that the mechanisms for processing *Kana* tend to localize in the left hemisphere, whereas those for *Kanji* in the right hemisphere.

2. Experimental Evidence

Evidence from visual field studies indicates that the right hemisphere may be dominant in processing ideographic script, especially single characters. Sugishita et al (1978) reported a LVFS for *Kanji* in a recognition

test of *Kanji* and *Kana* on three patients who had surgical section of the splenium of the corpus callosum. Such patients' two hemispheres are isolated. Hatta (1977) reported a significant LVFS for *Kanji*. *Kanji* characters are generally recognized with more accuracy irrespective of their familiarity, when they are presented to the left-visual-field. Based on such findings, Hatta suggested that reading Japanese text required the integrated action of both hemisphere processing systems to a greater extent than reading French or English text. The rationale, as suggested by Hatta, is that Japanese orthography relates rather differently to cerebral asymmetry of function than Roman orthography. In a later study, Hatta (1981) also found a significant LVFS for *Kanji*. Hatta believed that this finding at least suggested a specialization of the right hemisphere for individual *Kanji* processing. At the same time, several studies (Sasanuma et al, 1977 and Endo et al, 1978.) found a RVFS for *Kana*, the alphabetic script.

Such evidence was also obtained with Chinese characters. Tzeng et al (1979) reported a LVFS for single Chinese characters. However, this superiority was changed to a RVFS when pairs of characters were presented to the subjects. This suggested that the recognition of single Chinese characters might only involve recognition of spatial configurations, while recognition of pairs of characters might involve linguistic processing.

In a two-experiment study, Hung and Jones (1980) found that Chinese subjects showed no significant visual field superiority for naming single Chinese characters presented with a tachistoscope in their first experiment. In their second experiment, however, they found a significant LVFS among both Chinese and North American subjects for single Chinese characters in the discrimination test. The explanation they suggested is that the

discrimination task might involve recognition of the spatial configuration and might not require phonetic processing whether or not the phonetic code was available to the subjects, while the naming task might require both spatial and linguistic processing of the right and left hemispheres.

Evidence from other research also indicates that ideographic script and alphabetic scripts may require different processing mechanisms. In a study of processing mechanisms, Turnage and McGinnies (1973) presented a list of 15 words either visually or auditorily to two groups of 60 Chinese college students and two groups of 60 American college students. The finding indicated that Chinese students learned the list of characters faster when it was presented visually, while American students learned the list of words faster when it was presented auditorily. Turnage and McGinnies suggested that Chinese ideographs contain more characters with similar sounds but different meanings than is the case for English words, and this characteristic of the Chinese orthographic structure may favor learning through the visual code. An important factor they ignored in their consideration is that Chinese characters represent primarily meaning and form, rather than sound. In a similar study, Fang et al (1981) obtained the same results. They found that fluent readers of Chinese showed better performance in memory tasks under visual presentation, whereas American readers performed better under auditory presentation.

The above findings may indicate the existence of intrahemispheric functional specialization for auditory and visual characteristics of different scripts, because readers of an ideographic language may rely more on visual processing than on auditory processing, while readers of an alphabetic language may depend more on auditory processing. A study of

dyslexic children supports such a conclusion. Rozin et al (1971) conducted an experiment on teaching American children with reading problems to read English presented by Chinese characters. Eight second grade children with clear reading disability were successfully taught to read English material written in 30 Chinese characters. They suggested that this might be attributed to the fact that Chinese characters can map into speech at the level of words rather than of phonemes. In conclusion, the evidence from both clinical and experimental studies is summarized in TABLE III, following Henderson (1982, p.206)

TABLE III

COGNITIVE STYLES IN WORD RECOGNITION IN
IDEOGRAPHIC AND ALPHABETIC LANGUAGES

Type of scripts	ideographic	alphabetic
Locus of presentation effect	right-hemisphere superiority	left-hemisphere superiority
Processing mode	configurational visual holistic	rule-based phonological analytical

READING THEORIES

In this section, theories concerning reading are reviewed in two categories: theories on the schematic level and theories on the perceptual level. How such theories apply to second language learners is also reviewed, since this study is intended to study reading strategies in a second language.

It is well known that reading is a complex process. As early as 1908, Buehler (cited in Bransford, 1979) proposed a "field" theory to account for the interaction between one's knowledge and information in the text. In this theory, the field is the function of the relationship between incoming information from the text and previous knowledge from the reader. Similar ideas are found in later theories on reading comprehension.

Goodman (1967) suggested that reading involves partial use of minimal language cues on the basis of the reader's expectation. In this model, the minimal language cues bring in the information from the text, while the reader's expectation is built on his knowledge. Samuels and Eisenberg (1981) stated that reading comprehension is a match between the incoming information from the text and the information stored in the reader's mind. Wittrock (1981) suggested that reading is a generative process in which the reader generates meaning from the text by constructing relations between his knowledge and experience, and the written sentences, paragraphs, and passages. Smith (1982) called knowledge stored in the reader's head "cognitive structure". Reading comprehension is hypothesis testing on the text using the cognitive structure as the guidelines.

In this study, Goodman's theory is reviewed in detail, because his theory is most commonly adopted in the field of second language reading

study, and because the measurement, Reading Miscue Inventory, used in this study is developed within his theoretical frame. Goodman has developed his reading theory along the linguistic theory established by Noam Chomsky. This influence is reflected in two ways in his theory. First, the ability to read is innate and universal, as Goodman puts it, " Virtually every child's language is adequate for his present needs in communication. All language is equally good." (1964, p.49.) Second, two parallel levels of language formulation, surface structure and deep structure, are expressed, in Goodman's model of reading comprehension, as graphic, syntactic and semantic cues for the former, and meaning for the latter. The written text or surface structure is an expression of meaning or deep structure (Goodman, 1964, 1967).

When actual reading behavior is concerned, the reader is processing information cued by the written text to reconstruct the message the writer has conveyed. Specifically, the reader samples the graphic cues, makes predictions on the basis of his linguistic and nonlinguistic knowledge, tests such predictions and confirms or rejects them. This process is recycling and continuous as the reader keeps reading (Goodman, 1970).

The cues in Goodman's model belong to the perceptual level. At this level, there is first the question of what the perceptual unit is, and then the question as to whether print is phonologically processed. As far as the perceptual unit is concerned, two theories, namely, whole word recognition and letter-cluster recognition, are discussed in this study.

In the whole word theory (Smith, 1982, and Henderson, 1982), it is assumed that the reader does not identify a word letter by letter, but rather identifies a word holistically by its feature cues, such as envelope cues, and

that the reader's knowledge of the alphabet plays little role, and his knowledge of phonology no role in the process of word recognition. The envelope cue of a word is the outline of an individual word. If an envelope is drawn around the outline of a lower case word, different words have different shapes and length. In terms of progressive blurring of a word display in the process of word recognition, high frequency spatial information is filtered out as blurring increases, and therefore, the word input enters as a gross image, like an envelope (Haber and Haber, 1981; Henderson, 1982). However, studies specifically directed to the role of envelope cues in word recognition in alphabetic languages have totally failed to provide relevant evidence (Henderson, 1982). This lack of evidence may be natural since this theory ignores the fact that a word in an alphabetic language represents sound, and meaning, as well as form.

The letter-cluster theory (Smith, 1982, and Henderson, 1982), on the other hand, is both holistic and analytical. It is holistic in the sense that a word is not broken down into individual letters. It is analytical because the grouping of letters into clusters is rule-based. It follows the rules of orthography of alphabetic languages and of phonology. This theory is supported by evidence from tachistoscopic studies. Gibson et al (1962) compared two types of stimuli: pseudowords spelt in accordance with orthographic and phonological rules and nonwords spelt irrespective of any of the above rules. They found that rule-based pseudowords were reported with significantly greater accuracy than non-rule-based nonwords. Gibson suggested that the superiority of pseudowords resulted from their pronounceability.

Smith and Haviland (1972) compared recognition of two types of

trigrams, consonant-vowel-consonant words and tri-consonant nonwords, with the probed forced choice method, in which the subjects were required to report which of the two given letters had occurred in a marked position. They found a word superiority over nonword in spite of the explicit training for nonwords. Their finding indicates that orthographic and phonological rules are psychologically real, and play an important role in word recognition in an alphabetic language.

The findings from the above studies appear to support Conrad's suggestion (1964) that phonetic reading does take place in silent reading. Conrad demonstrated in his study that phonetic reading took place in processing verbal materials even when they were visually presented. This phonetic reading is also called inner speech (Banks et al, 1981). It is suggested that inner speech plays an important role in silent reading. For example, we would miss puns and other wordplays that the author intended in a text if there were no inner speech.

As for the modes of recoding, two routes are commonly proposed: (1) a nonlexical grapheme-phoneme correspondence (hence, GPC) route, and (2) a lexical word specific route (Henderson, 1982). The nonlexical GPC employs the phonological rules to decode graphemic elements into pronunciation. Evidence from studies of surface dyslexia, pronounceability of pseudowords and orthography support this assumption. In the lexical route, there is an internal lexicon which contains the representations of graphemes, phonology and semantics. When visual information specifies the internal lexicon, pronunciation is achieved. The existence of such a lexicon is supported by evidence from research of the effects of lexical status, logographs, homophones, and irregular words (Henderson, 1982). As a matter of fact,

either route may exist, depending on the nature of the script and the task involved.

Reading as a process, whether at the schematic level or at the perceptual level, is considered universal in Goodman (1970, 1976). He suggested that " Learning to read a second language should be easier for someone already literate in another language, regardless of how similar or dissimilar it is" (1970, p. 66). He cited findings from studies of reading German, Polish, Spanish, and Yiddish to support his assumption. As a matter of fact, he predicted that the process of reading a nonalphabetic language, like Chinese, would be the same as that of reading an alphabetic language.

Studies in reading a second language provide evidence for Goodman's claim in two aspects: the process of reading and the transfer of reading skills from a first language to a second language. Lopez (1977) studied the reading process of 75 Mexican-American children in second and third grade with miscue analysis. The finding indicates that the Spanish readers use contextual cues, together with their knowledge of sound and symbol relationships, to make predictions about meaning, as English readers do. Evidence from research in second language reading also indicates that ESL students transfer their reading skills from their first language to the second language. In a study of Arabic ESL students, Al-Rufai (1976) found that reading skills were transferable but the transfer took place only when the second language was used with ease by the reader. In a study of the reading skills of three groups of Spanish-speaking ESL students of differing English proficiency, Deemer (1978) found that the highest English proficiency group showed a strong significant correlation between reading skills, the middle group showed a mild correlation, while the beginning readers of English

showed no correlation in the two languages. Deemer claimed that reading for meaning is a non-language specific skill which can be transferred to a second language that is being learned. However, it is not clear whether skills at the perceptual level are transferable or not.

In short, several authors believe that reading is a generative process at the schematic level, and it is universal in the sense that it is common in all languages and transferable from the first language to the second language. At the perceptual level, there are two common theories, whole word recognition and letter-cluster recognition. In the former, words are recognized as an image, whereas in the latter words are recognized in letter-clusters based on the rules of phonology and orthography. The former may be common in reading an ideographic language, and the latter in reading an alphabetic language. At present in reading a second language, there is some research evidence for the claim of reading as a universal process at the schematic level, but not enough evidence for it at the perceptual level.

SUMMARY

Literature on three areas of study, cerebral dominance, script effects and reading theories, is reviewed in this study. When the left hemisphere is concerned, evidence from clinical research indicates that the left hemisphere specializes in controlling motor coordination for speech production, and in processing language knowledge and vocabulary. Dichotic studies demonstrate that the left hemisphere is capable of processing both linguistically meaningful and meaningless stimuli. This may suggest that the left hemisphere is capable of processing stimuli at the phonological

level as well as at the acoustic level. Evidence from visual field research shows that RVFS (left hemisphere) depends on the nature of the task rather than the nature of the stimuli. When tasks involve language processing, RVFS occurs. It does not when tasks involve non-language processing. The study of handedness provides a high correlation between handedness and cerebral dominance for right-handers, though it does not for left-handers. This might be genetically determined as suggested by some researchers.

On the other hand, studies of the right hemisphere also indicate that the right hemisphere is also specialized in processing linguistic materials in some way. Research evidence shows that it processes lexical information semantically, especially for single words. Evidence from visual field studies indicates that the right hemisphere is more involved in the analysis of visual features of verbal materials. It is better at processing concrete words, which may result from its holistic approach and its incapability of employing grapheme-phoneme correspondence rules. Dichotic research provides evidence that the right hemisphere is capable of processing the acoustic features of stimuli, but not the phonetic features, especially those of consonants. It is suggested that the processing of the latter requires more specialized and complex acoustic reconstructing of sounds. The right hemisphere is probably not specialized for this task.

Script effects may be a product of the relation between cerebral functions and the characteristics of ideographic and alphabetic scripts. Clinical research demonstrates a pretty clear selective impairment of ideograms and phonetic script in Japanese aphasiacs. Usually left brain damage results in impairment of *Kana*, while right brain damage causes incapability of processing *Kanji*. There is also evidence of selective

impairment of either Chinese or English in Chinese bilingual aphasiacs, depending on the location of the lesion. In addition to the clinical evidence, experimental research indicates that there are intrahemispheric functional specializations. For example, the left hemisphere has a more direct auditory access to *K'ana*, whereas the right hemisphere has a more direct visual access to *K'anji*. Mechanisms are functionally task-specific.

Theories on reading at two levels have also been reviewed. At the schematic level, it is generally considered that reading comprehension is a generative process. The reader uses surface cues, graphic, syntactic, etc., in the text to construct meaning in the deep structure with the help of his previous knowledge. At the perceptual level, graphic cues may be processed as a whole-word or as letter-clusters. When processing graphic cues as a whole-word, the mechanism is word-specific. When processing graphic cues as letter-clusters, the mechanism is rule-based, based on the rules of orthography and phonology. It is controversial whether phonetic recoding takes place in the above processes. The letter-cluster theory provides a rationale for the grapheme-phoneme correspondence route in alphabetic languages. The whole-word theory may apply to alphabetic languages, but it shows less evidence for a word-specific route of phonetic recoding in an ideographic language.

Reading as a universal process is well supported by evidence from research at the schematic level, for example, identical processes in reading different languages and transfer of skills from a first language to a second language. However, there is not much evidence for a universal process at the perceptual level.

CHAPTER III.

RESEARCH METHODS AND PROCEDURES

In this chapter, subjects, research design, research measurements, materials, and procedures are described in detail. Validity and reliability, which are of great concern in any research, are also discussed.

SUBJECTS

Three subjects from each of the following orthographic and linguistic populations were used respectively: educated native speakers of Chinese who were American university students; educated native speakers of Spanish who were American university students; and mono-literate American-Chinese college students whose first oral language was Chinese, but whose first written language was English. The total subjects used in this study were nine. They were all regular undergraduate or graduate students at Portland State University, majoring in the fields of science, art, psychology and business. Their English proficiency level was above 550 as measured by TOEFL, or equivalent to or above this score as measured by other standard English proficiency tests, since English proficiency comparable to this level is required by the school for non-native speakers upon regular admission into a degree program.

Chinese students in American universities generally had a good education in their native language, and studied English as a foreign language before they came to the United States. The Chinese students and Spanish-speaking students in this study were second language speakers at an American university, and were considered to have comparable experiences of learning English as a foreign/second language, comparable English proficiency, and comparable first language education. The third group, the Chinese-Americans, might have a higher English proficiency in certain aspects, since English was their first written language. The key consideration of employing this group was that they were mono-literate bilingual.

The available population of the second and third groups of ESL students was very limited at the school where the research was conducted. This, together with other limitations, made random sampling very difficult. As a result, sampling of subjects was based on prospective subjects' qualification for this research and cooperativeness. All subjects were either recommended by their professors and by peer students, or were the researcher's students. They received the interview and reading test on a voluntary base. The sampling of mono-literate American-Chinese students who were non-literate or semi-literate in Chinese was particularly difficult, because few non-literate Chinese students reach the English proficiency level that educated Chinese or Spanish-speaking students have reached. Subjects who had been non-literate in Chinese and who had become proficient English readers and college students before they began to learn written Chinese at school were used in this study. Such subjects were still qualified, because English was their first written language, and

alphabetic script effects are assumed to be dominant, though Chinese is their first oral language.

The Chinese subjects: These three subjects were born in China, and had their college education in China. They were all graduate students at the school, majoring in art, mathematics and business administration when this study was conducted. They were all male adults, and their age ranged from twenty-six to thirty-one .

Subject ZQ, a right-hander and artist, was a fast reader in Chinese as evaluated by himself in comparison with his peers. ZQ had studied English as a foreign language for 5 years in high school and at college, and had also devoted a lot of his spare time to studying English before he came to the United States. He had been in the United States for 13 months when the test was given.

Subject RZ, a right-hander and mathematics major, was a fast reader in Chinese as evaluated by himself in comparison with his peers. RZ had studied English as a foreign language for 5 years in high school and at college, and had spent a lot of time studying English by himself. He had been in the United States for 18 months.

Subject SW, a right-hander and business major, was a moderate reader in Chinese as indicated in a self-evaluation in comparison with his peers. FW had studied English as a foreign language for 4 years, and studied English during his spare time after he left college. He had been in the United states for 18 months.

The Spanish-speaking subjects: The three subjects had 12-14 years of education in Spanish before they came to the United States. They were undergraduate students of sciences or psychology at the school where the

research was conducted. One of them was a female, and the other two were male. Their age ranged from twenty-four to thirty-eight.

Subject PT, a female left-hander, was born in Mexico, and was a fast reader in Spanish as evaluated by herself in comparison with her peers. She had been in the United States for 13 years, and had formal education in English for 3.5 years.

Subject EO, a male right-hander, was born in Mexico, and was a fast reader in Spanish according to his self-evaluation in comparison with his peers. He had been in the United States since 1985 when this test was given. He had 3.5 years of formal education in English.

Subject EM, a male right-hander, was born in Bolivia, and was a moderate reader in Spanish as evaluated by himself in comparison with his peers. EM had been in the United States for 8 years, and had 4 years of formal education in English.

The Mono-literate American-Chinese subjects: The three subjects were undergraduate students, and were not literate in Chinese before they began to study Chinese as a foreign language at the school, although they all spoke a Chinese dialect as their first language. Therefore, Chinese was their first oral language, while English was their first written language. They were all female, and their age ranged from twenty to twenty-two. The term American-Chinese was used in this study, because the subjects preferred to be called American-Chinese instead of Chinese-American.

Subject CY, a right-hander, was born in Hong Kong, and went to kindergarten for 2 years and school for 1 year, where Cantonese, a dialect of Chinese, was spoken. She came to the United States when she was about 9 years old. She had more than 11 years of formal education in English. She

spoke Cantonese with her family members and friends. When she came to a Chinese class at the school, she could read only a few numbers, and her own and family members' names in Chinese. She did not do better than native speakers of English in written Chinese exercises and examinations in the class.

Subject CC, a right-hander, was born in Hong Kong, came to the United States when she was about 5 years old, and had 16 years of formal education in English. CC spoke Cantonese at home and did not read Chinese before she took 1 year of Chinese at the school. She said that she had forgotten much of the Chinese learned at the school when she took the reading test for this research.

Subject FH, a right-hander, was born in Hong Kong, and came to the United States at the age of about seven. She had more than 13 years of formal education in English, but spoke mostly Cantonese at home. She did not read Chinese before she studied Chinese as a Foreign language at the school. She had studied one year and two terms of Chinese when she took the reading test for this research.

The data of the three groups of subjects are summarized in TABLE IV on the next page.

TABLE IV

CHARACTERISTICS OF THE THREE GROUPS OF SUBJECTS

	Chinese Subjects	Spanish-Speaking Subjects	Monol-Literate American- Chinese Subjects
First Language			
Oral	Chinese	Spanish	Chinese
Written	Chinese	Spanish	English
Years of Educa- tion in English	4-5	3.5-4	11-16
Years in the US.	1.1-1.5	3-13	12-17
Age	26-31	24-38	20-22

RESEARCH DESIGN

This study is considered causal-comparative research, since some important variables could not be manipulated directly and experimentally. The independent variable, script effects, is an attribute variable that the defined subjects possessed before the research began. In this study, script effects were manipulated only to the degree of grouping subjects according to their orthographic and linguistic backgrounds, their education in their native language and their English proficiency level. The main dependent variables measured are (1) their oral reading miscues, (2) reading comprehension scores, and (3) difference in treating familiar and unfamiliar

words. The main dependent variables evaluated are (1) English proficiency level, and (2) orthographic and linguistic backgrounds.

In this study, script effects of the orthography of Chinese on Chinese ESL/EFL students are examined by comparing the reading strategies employed by Chinese ESL/EFL students with those employed by alphabetic language readers--native speakers of Spanish and monoliterate American-Chinese students.

The group of educated native speakers of Chinese was adopted as the defined group for this study of script effects on their reading strategies. The group of Spanish-speaking ESL subjects was used as a comparison group so that reading strategies employed by ideographic language (Chinese) readers could be compared with those employed by alphabetic language (Spanish) readers. Generally speaking, Spanish orthography, like that of other alphabetic languages, is based on consistent phonetic principles (Katzner, 1975). If measured on the scale of the relationship between letter and sound, Spanish orthography is more at the end of direct single letter-to-sound correspondence than is English. This close correspondence is indicated by the number of vowels and consonants in Spanish, in which there are only five vowels and twenty consonants (Burt, 1980). As in English, consonant-letter clusters are common in Spanish, though they never appear at the end position of a Spanish word.

In addition to the purpose of comparison between reading strategies employed by ideographic language readers and those by alphabetic language readers, the group of non-literate or semi-literate Chinese subjects was used to test the preliminary hypothesis that the influence of script effects on reading strategies is independent of the linguistic structure of a speech

or a language, or in other words, script effects are script effects, since script effects, as cognitive functions, are developed in processing the visual-spatial characteristics of ideographs such as Chinese characters.

RESEARCH PROCEDURES

The first step in this study was interviewing prospective subjects who volunteered for the study. While being interviewed, they were asked to fill out a questionnaire for the study, and an informed consent form which was required by the school. It was found that the interview was necessary to screen out prospective subjects who would otherwise identify themselves as qualified for the study in the questionnaire, because of their misunderstanding of some terms, like first language, first oral language or first written language, used in recruiting subjects and in the questionnaire. In addition, this interviewing provided a chance for the researcher to learn more about the subjects, and for the subjects to learn the purpose of the research and what was expected from him/her in the study. This acquaintance also eased, to some degree, the subjects' anxiety in the process of reading and being taperecorded.

The second step was administering the reading test to the subjects. The test was administered to the subjects in the researcher's office in a span of a week, starting on the previous Tuesday and finishing on the next Tuesday. The test was given at a time arranged by the researcher and the subjects at the subjects' convenience, except for the two Chinese subjects. These two Chinese subjects were given the test consecutively in one afternoon, because they knew each other well and knew that they both were

to take the test for this study. This measure was taken to prevent them from talking with each other about the text and comprehension questions before both of them were given the test. During the administering of the test, these procedures were followed:

- (1). Giving instructions to the subjects and answering the subject's questions about the instructions;
- (2). Recording the subject's name, checking and adjusting the volume of the recorder;
- (3). Subject reading the text, which was simultaneously recorded;
- (4). Subject answering the reading comprehension questions;
- (5). Giving the subject the definition of an unfamiliar word;
- (6). Subject underlining unfamiliar words in the reading text.

RESEARCH MEASUREMENTS

In this study, the major measure is Goodman and Burke's Reading Miscue Inventory (hence, RMI)(1972). This measure was adopted for the following reasons: (1) reading is a universal process (Goodman, 1973; Clarke and Silberstein, 1977) both in the first language and the second language as supported by research evidence; (2) RMI is a measure developed within Goodman's theoretical frame; and (3) RMI is a qualitative and quantitative measure that provides graphic cues and phonological cues essential to this study and, moreover, relates these cues to the overall reading strategies and reading comprehension (Goodman and Burke, 1972.).

RMI consists of a Reading Miscue Inventory Coding Sheet and a Reading Miscue Inventory Reader Profile (see Appendix A). The coding sheet has

nine categories concerning: (1) Dialect, (2) Intonation, (3) Graphic Similarity, (4) Sound Similarity, (5) Grammatical Function, (6) Correction, (7) Grammatical Acceptability, (8) Semantic Acceptability, and (9) Meaning Change. In addition, it has two categories, Comprehension and Grammatical Relationships, regarding the interrelationships between Categories 6,7,8 and 9. RMI consists of two procedures for the subjects: reading a text and retelling of the reading text. In this study, some modifications of the coding sheet and procedures were made in order to make RMI more suitable for the purpose of this study and for the subjects who were non-native speakers.

First, miscues which belong to Categories (1) Dialect and (2) Intonation were not marked on the worksheet, nor coded on the coding sheet. Non-native speakers have general problems with their pronunciation and intonation. If miscues of dialect and intonation had been marked and coded, a considerable part of the twenty-five miscues coded would have fallen into Categories (1) and (2). Miscues of dialect and Intonation, as a general problem for non-native speakers, can not reveal the reality of their reading process.

Second, some criteria for the coding procedures were added to Categories (3) and (4), otherwise procedures in RMI (Goodman and Burke, 1972, p. 42-48) were followed closely, as stated below:

1). the same as in RMI (see Appendix A)

2). A partial word substitution was coded only for the first occurrence, if the identical partial substitution occurred across the reading text, and whether it was corrected or not:

example; text: philosophical

miscue: (1) philo-

Miscue (1) was coded only once, even if it occurred more than once.

A partial word substitution was coded every time, if unidentical partial substitutions for the same word occurred across the reading text, whether they were corrected or not:

example; text: philosophical

miscue: (1) philo- (2) philosoph-

Miscues (1) and (2) were coded every time.

A partial word substitution was coded every time, if it tended to deviate from the expected response, whether it was corrected or not:

example: text: philosophical

miscue: phys-

3). the same as in RMI (see Appendix A)

4). the same as in RMI for (a), (b) and (d) (see Appendix A), but there was a modification for (c), that is, miscues falling into this category were coded every time.

5). the same as in RMI (see Appendix A)

6). (a), (b) and (d) the same as in RMI (see Appendix A), but modifications for (c) and (e): miscues falling into Category (c) were coded; miscues in Category (e) were coded if part of a syllable or a syllable was repeated:

example; text: philosophical

miscue: philoso+sophical

Third, some criteria for coding miscues in Category (3), Graphic Similarity, and Category (4), Sound similarity, were added and defined for the purpose of this study, because there is no precise coding criteria in RMI

where the coding of miscues in Categories (3) and (4) is concerned. In RMI, readers' responses and the expected responses are judged and coded as having high, some, or non graphic or sound similarity, according to the composition of the beginning, middle and end of the responses (Goodman and Burke, 1972, p. 53). Such coding units were too vague for this study, since graphic similarity and sound similarity were of particular importance in this study. More precise units were needed in coding these two categories.

It is of great interest whether it is possible to make the difference between graphic similarity and sound similarity in English. It is generally held that the mapping of phonemes into written forms, and of written forms into phonemes demands reference to higher level information , so far as the English orthography is concerned. This problem has been approached both theoretically by Chomsky, and empirically by Venezky.

According to Chomsky (1965), and Chomsky and Halle (1968), English phonological rules work on an abstract level. Between the phonological rules and the surface structure of a sentence, there is a lexical representation, which is more abstract than the phonetic representation. Native speakers and readers are intuitively aware of these abstract rules and the representation. This theory, of course, can account for both the irregularity of letter to sound correspondence in English, and a native speaker's sensitivity to stress and syllable or morpheme boundaries. Probably this sensitivity, developed in the speaker's left hemisphere, is expressed as native speakers' intuition,

Venezky (1970) took a more practical and empirical approach to the problem, when the relationship between letter to sound or phonetic representation is concerned. Instead of letters, he mapped a graphic unit to

sound or phonetic representation. This graphic unit can be functionally defined as a single letter or a letter cluster. In the word "cat", for example, single letters are directly mapped to the phonetic representation [kæt], while in the word "morpheme", the letters "p" and "h" are not mapped to the phonetic representation as single letters but together as a graphic unit. This graphic unit is an intermediate level, at which morphophonemic information is given regarding the internal structure of words, that is, the boundaries of syllables or morphemes. A reader who is not sensitive to this information, may read "morpheme" as ['mo:phim] rather than ['mo:fim], or "topheavy" as [to'rev'i] rather than [top'hev'i]. In both situations, there is little sound similarity, but a great graphic similarity between the reader's responses and the target word's phonetic representation.

In the English writing system, single letter-to-sound correspondence, like "cat" and [kæt], is not very common, while letter clusters play an important part. The discrepancy between single letters and phonemes makes it possible to distinguish graphic similarity and phonological similarity both theoretically and practically. In this study, coding criteria for sound and graphic similarities have been developed to account for a reader's sensitivity to the letter sequences, letter clusters, and boundaries between morphemes or syllables. In these coding criteria, the measure unit for sound similarity is defined as a syllable for multi-syllabic words, and defined as a phoneme for mono-syllabic words, based on the theoretical and empirical studies discussed.

Sound similarity is distinguished as follows:

No Similarity: when more than half of the syllables/phonemes, or half of the syllables including the stressed syllable are changed;

example: hat -- [næf], [heit]

uphill -- ['fi]

Some Similarity: when the stressed syllable or half of the syllables (not including the stressed)/phonemes are changed;

example: something -- ['sʌmtaimz]

keen -- [kni:]

High Similarity: when two-thirds or more than two thirds (including the stressed) syllables/phonemes remain unchanged;

example: sometime -- ['sʌmtaimz]

The measuring unit for graphemes in this study is defined as a single letter. Graphic similarity is defined as follows:

No Similarity: when two-thirds or more of the letters are changed;

example: hat -- [næf] -- naf

Some Similarity: when fewer than two-thirds of the letters are changed, or fewer than half of the changed letters are consonant letters, because consonant letters are more salient as graphic cues:

example: letter -- [lɛtə] -- leffer

temptation -- ['temprətʃən] -- temperature

High Similarity: when one-third or fewer than one-third of the letters are changed:

example: hat -- [næt] -- nat

sometime -- ['sʌmtaimz] -- sometimes

Fourth, partial word miscues were not coded in Categories (5), (7), (8), and (9), but were coded in Categories (6), Comprehension and Grammatical Relationships. In Category (6), partial word miscues were coded as Y, P, and N, as stated in the instruction for this category (Goodman

and Burt, p. 59, 1972). These partial word miscues, coded as Y, P, and N in Category (6), were coded in Comprehension and Grammatical Relationships, according to the instructions stated in RMI.

A fifth modification of the test procedures was to replace the oral retelling with a reading comprehension test. The rationale for this modification is that ESL students generally have difficulty in appropriately expressing themselves orally. Their oral expression is hindered especially under the pressure of the environment that RMI procedures create.

Part of the RMI reader profile, the graphs for sound/graphic relationships, grammatical relationships and comprehension, was adopted in presenting the data in Appendix B.

In addition to the modifications of RMI coding criteria and procedures, two other measures were adopted, together with a questionnaire, in this study. One of them was the measure of subjects' responses to unfamiliar words. An unfamiliar word was defined as a word of which subjects were not confident of the meaning. This was designed to examine the differences in subjects' graphic and phonological responses to familiar words and to unfamiliar words. Based on the research literature, ideographic language readers and alphabetic language readers take different cognitive approaches to written words. Ideographic words represent primarily form and meaning while alphabetic words represent sound, form and meaning all together; therefore, ideographic language readers are expected to have difficulty with the phonological structure of unfamiliar words, whereas alphabetic language readers are not. When ideographic language readers read unfamiliar words, their reading behavior is supposed to reveal their cognitive process more clearly, because more efforts are needed in this

processing. In this procedure, the subjects were required to mark unfamiliar words in the reading text after they had read the text and answered the reading comprehension questions. These marked unfamiliar words were listed for each subject, and compared with the miscues they had made. The miscues here were defined as any miscues marked for the coding sheet, plus long pauses made before an unfamiliar word marked on the working sheet.

The other measure was the reading comprehension test. The test consisted of seven multiple-choice questions (see Appendix E). There were three types of questions: questions about the general tone/meaning of the text, questions about the meaning of a paragraph and questions about a specific statement or specific information.

The questionnaire (see Appendix C), asked for information of birth place and date, first and second language and handedness. It was given to all prospective subjects to obtain the essential information for this study. The population of prospective subjects given this questionnaire was greater than the population of subjects actually used in the study, so that qualified subjects were selected.

MATERIALS

Three reading texts of different levels of readability were selected for this study as required by RMI procedures. These three texts were measured by Fry's Readability Graph (Pescosolido and Gervase, 1971) as high-level, medium-level and lower-level, namely, equivalent to texts well above college level, college level and eleventh grade level. All three reading

texts were pretested in a pilot study, but only the medium level text and the low level text were actually adopted in this study, because the high level text was too difficult for students whose English proficiency level and background were comparable to the subjects.

Fry's Readability Graph (see Appendix D) was adopted as a measure of text readability, because it was the readability measure that was available and that measures the readability of a text of different levels and yields equivalents for reading texts from lower level to college level.

The medium-level text of about 1130 words adopted in the study was selected from the introduction in Benjamin Franklin's AUTOBIOGRAPHY (Nye, Ed., 1958) (see Appendix E). A random sampling of 95 consecutive words in the text was measured for its readability with Fry's graph:

(1) S1 (number of syllables in sample)	159
(2) S2 (number of sentences in sample)	4
(3) W (number of words in sample)	95
(4) X1 (syllables per 100 words)	$= \frac{C(S1)}{W}$
	$= \frac{100(159)}{95} = 167.3$
(5) X2 (sentence per 100 words)	$= \frac{C(S2)}{W}$
	$= \frac{100(4)}{95} = 4.2$

X1, 167.3, and X2, 4.2, equals a readability equivalent to a college text (see Appendix D).

The low-level text of about 1200 words was selected from AN INTRODUCTION TO INTERCULTURAL COMMUNICATION (Condon et al, 1975) (see Appendix E). A random sampling of 108 words was measured for its readability with the same graph:

(1) S1 (number of syllables in sample)	173
(2) S2 (number of sentences in sample)	6
(3) W (number of words in sample)	108
(4) X1 (syllables per 100 words)	$= \frac{C(S1)}{W}$
	$= \frac{100(173)}{108} = 161$
(5) X2 (sentence per 100 words)	$= \frac{C(S2)}{W}$
	$= \frac{100(6)}{108} = 5.5$

X1, 161, and X2, 5.5, equals a readability of eleventh grade text.

RELIABILITY AND VALIDITY

The reliability and validity of measurements used in research is always of central concern. In this study, the questionnaire given to prospective subjects guaranteed internal validity by bringing two variables, subjects' orthographic and linguistic backgrounds, and education in their native languages and comparable English proficiency, under control.

To explore the appropriate procedures, a pilot miscue analysis was given to three subjects of comparable backgrounds. Procedures, coding criteria and materials prepared for this study were tried in the pilot study. In addition to reliability in general, this step particularly ensured that the reading texts were appropriate for the subjects, because an easy text could not produce enough miscues, while a difficult text would arouse too much frustration in the subjects. The reading text that was found most suitable in the pilot study was appropriate for eight out of the nine subjects in the study. It also made it easier for the researcher to sense at once that the text being read was difficult for one of the subjects, and to immediately change it for an easier one.

Two procedures were of particular concern in this study as far as reliability was concerned. One was the coding of miscues. Following the procedures and coding criteria set in RMI or for this study, another coder and the researcher worked separately on the coding of miscues, especially the graphic and phonological miscues, and achieved an inter-rater reliability of $\rho 0.95$ as measured by Spearman's rank-difference formula. The miscues marked on the worksheet were also checked by another marker with original transcripts. An inter-rater reliability of $\rho 0.97$, as measured by Spearman's rank-difference formula, was achieved.

The other concern was the validity and reliability of the comprehension test. After the multiple choice items were constructed for the reading texts, they were given to three native speakers of English and two Chinese EFL teachers to check (1) if the questions were appropriate according to the texts, and (2) if the multiple choices were appropriate. Inappropriate questions and test items were rewritten, following their

suggestions. To make sure that the answers match the detractors in the tests, a pretest was administered, without the reading text, to three regular non-native speaker students and three native speaker students. Answers that were guessed more than three times by students in the pretests were eliminated from the tests.

In this chapter, three groups of subjects, Chinese students, Spanish-speaking students and monoliterate American-Chinese students, were described, with the Chinese students as the defined group, and the Spanish-speaking students and monoliterate American-Chinese students as the comparison groups. This study is considered a causal-comparative research, because the independent variable, script effects, is an attribute variable that existed before the research began and that could not be directly manipulated. In this study, procedures for RMI were followed, except where changes were made. A major modification of the main measurement was the coding criteria for Category (3), graphic similarity, and Category (4), sound similarity. The new coding criteria were based on Chomsky's (1965), and Chomsky and Halle's (1968) theoretical studies, and Venezky's practical and empirical study (1970). Two other measures used were a questionnaire and measurement of subjects' responses to unfamiliar words. To ensure the reliability of this study, a pilot study of three comparable subjects was carried out to explore criteria, procedures and materials. Regarding the marking and coding of miscues, an inter-rater reliability of above rho 0.9 was achieved.

CHAPTER IV.

RESULTS AND DISCUSSION

Descriptive statistics and graphs were adopted to analyze and present findings in this study. The rationale for using only descriptive statistics in analyzing the data was based on the theoretical assumptions of the statistic tools. Descriptive statistics deals with the relationships within a sample only. In this study, because the sample was small, and subjects were not randomly sampled, it would be difficult to make strong inferences on the population by using inferential statistics. All the data obtained from RMI and other measures were first displayed to provide an overall picture, and then related data were presented and computed pertinent to each of the three hypotheses in this study. The data relevant to each hypothesis were usually compared for between-group and within-group relationships. The former indicates tendency, variability and relationships among the three orthographic and linguistic groups, while the latter describes those within each orthographic and linguistic group.

A DESCRIPTION OF GENERAL FINDINGS

In the texts of 1130-1200 words, the average miscues made by a

Chinese reader are 59.7, by a Spanish reader 34, and by a mono-literate American-Chinese 30.3. Data obtained from RMI for the three groups were computed as percentages, and presented in TABLE V as group means:

TABLE V
GROUP MEAN PERCENTAGE OF RMI CODING SHEET

		CHN	SP	AMCHN
Graphic	Y	51.1	48.2	44.1
	P	24.9	22.2	25
	N	23.9	29.6	27.6
<hr/>				
Sound	Y	28.8	12.7	28.3
	P	29.6	48.1	22.6
	N	41.6	39	49.1
<hr/>				
Grammatical	Y	63.9	58.2	68.4
	P	0	2.3	2.4
	N	36.1	39.4	29.2
<hr/>				
Compre- hension	NL	46.7	68	48
	PL	12	9.3	22.7
	L	41.3	22.7	29.3
<hr/>				
Grammatical relationships	S	38	62.7	50.7
	PS	24	13.3	30.7
	W	28	14.7	10.7
	O	1.3	9.3	8

Note: Y = high, P = partial, N = no, NL = no loss, PL = partial loss, L = loss, S = strength, PS = partial strength, W = weakness, O = overcorrection, CHN = Chinese, SP = Spanish speaker, AMCHN = monoliterate American-Chinese. (These abbreviations were used for all the tables and figures in this chapter.)

Data obtained from other measures were computed as percentages, and presented as group means in Table VI, except data of reading time which were in minutes and seconds.

TABLE VI
GROUP MEANS OF VARIABLES MEASURED WITH OTHER MEASUREMENTS

	Reading Compre- hension Score	Reading Time	Miscues per 100 Words	Miscues per 100 Unfamiliar Words
CHN	61.9	14' 22"	5.1	44.9
SP	42.8	8' 56"	3	31.2
AMCHN	76.2	7' 4"	2.7	15.8

Note: ' = minute, " = seconds, definition of unfamiliar words on page 52.

The relationships between the comprehension category in RMI and reading comprehension scores are not positively correlated. The former indicated a grammatical relationship, while the latter is what the reader learned from the text. The relationships between categories are statistically significant in two clusters: the first three categories and the last two categories. The first three categories are significantly correlated, because form, sound and function are closely related to each other in English. For example, the form and sound are similar when "philosophical" is read as "philosophy". They are coded as high graphic and sound similarity, but their grammatical functions are different, since one of them is a noun while the

other is an adjective. It is clear that there is a certain relationship among the three categories, as indicated by the above examples. However, if the miscue "philosophy" is corrected, the grammatical function of "philosophical" is coded, instead of "philosophy", in comprehension and grammatical relationships categories. The consideration of corrections in coding the last two categories canceled their relationships with the first three categories whenever a correction is made, and reduces the general relationship between the first three and the last two categories. In analysis of the data relevant to each hypothesis, the correlation was mainly considered in the first cluster.

FINDINGS RELEVANT TO EACH HYPOTHESIS

Findings relevant to hypothesis (1): Hypothesis (1) stated that ideographic language (Chinese) readers may rely more on graphic cues than alphabetic language (Spanish and English) readers in reading English as a second/foreign language, if they read English in the way they read Chinese; graphic cues are defined as graphic similarity measured by RMI as miscues in this study.

A comparison of the mean percentage of both high and partial graphic miscues produced by each of the three groups did not show a significant difference among the three groups, as shown in TABLE VII, and illustrated in Figure 1 on page 62. This result might indicate that (1) Chinese subjects did not rely more on graphic cues than the Spanish and English readers, or (2) it is difficult to measure significantly quantitative difference in employment of graphic cues in an alphabetic language, such as English.

TABLE VII

CENTRAL TENDENCY & VARIABILITY OF MEAN HIGH GRAPHIC SIMILARITY

	Mean	Range	Standard Deviation
(Y) Graphic Similarity	47.8	7.04	2.79
(P) Graphic Similarity	24.05	2.7	1.4

Note: range = the highest individual score minus the lowest

Figure 1. A comparison of mean graphic similarity of three groups

However, the slight quantitative difference may well suggest some qualitative difference in consideration of the relationships among the

graphic similarity and other categories of miscues and relationships measured by RMI. For instance, the correlation of high graphic similarity and grammatical function shows the relationship between form and function, since the graphic similarity category measures whether a miscue deviates from that of the target word, and the category of grammatical function measures whether the grammatical function of a miscue deviates from that of the target word in the text. A negative correlation shows a tendency that the more graphic cues a subject relied on, the more the grammatical function of miscues deviated from the target word. For example, a Chinese subject identified "prudent", an adjective, as "product", a noun. A Spanish subject identified "despite", a preposition, as "despise", a verb. In such a situation, the subjects apparently depended too much on the graphic cues, and failed to fully employ the context.

A study of within-group correlations (TABLE VIII) indicated that the correlation of graphic similarity with grammatical function was -0.999 in

TABLE VIII
WITHIN-GROUP CORRELATION OF HIGH GRAPHIC
SIMILARITY WITH OTHER CATEGORIES

	Sound Simi- larity (Y)	Grammatical Function (Y)	Comprehension (No Loss)	Grammatical Relationships(S)
CHN	0.965	-0.999	0.886	0.719
SP	-0.62	-0.01	0.946	0.456
AMCHN	0.836	0.959	0.15	-0.529

(Y) Graphic
Similarity

the Chinese group. This was a sign of a strong trend for the Chinese readers' reliance on graphic cues and failure to use the context. In other words, a Chinese reader who made more miscues of high graphic similarity also made more miscues that deviated from the target words' grammatical functions. The Chinese readers, under constant pressure of vocalizing words in the text, were rushed to read word by word, rather than exploit the context to predict the following words and how these words fit into the sentence structures. However, this tendency was weak in the Spanish readers' miscues, which meant that the Spanish readers used more context than the Chinese. The American-Chinese readers' reading behavior provided a different picture: their miscues were usually functionally similar. This similarity indicated that the more miscues they made the more contextual predictions they made.

When the relationships between the use of graphic cues and variables measured by non-RMI measurements were considered, the graphic similarity and reading time relation was interesting, as illustrated in Figure 2 on the next page. The more a group was reliant on graphic cues the more reading time that group needed in reading. An explanation of this phenomenon suggested here is that the phonological representations of words may be activated automatically with minimum graphic cues when one reads actively, making predictions of the incoming words and structures based on the context. However, when one reads passively, word by word, he/she may need to extract more adequate graphic information from a word in the text before he/she can vocalize it. There may exist a certain time lag before the phonological representation is activated when graphic information is used to retrieve it. In the lexicon, a word may consist in part of an orthographic

Figure 2: Relationship between graphic similarity and time spent in reading

entry associated with a phonological representation (Glushko, 1981). In reading aloud, the retrieval of the phonological representation becomes the most important and apparent process. The lag between the visual coding of graphic information and retrieval of the phonological may depend on the association of the graphic and phonological representations in the lexicon. Normally, the articulation is four words behind the eye fixation of a word (Henderson, 1982). Barron (1981) found that less skilled native readers of English could not activate phonological representations as rapidly as skilled native readers.

Readers of English as a second/foreign language may have a much looser association between the graphic and phonological representation in the lexicon than native readers. This loose association may increase the

time lag and result in slow speed in vocalizing a word in reading aloud.

In addition, visual information of graphic cues obtained from the text has a very short life time in iconic storage or as the spatial patterns in a brief display in the short term memory (Levy, 1981, and Mitchell, 1982). If retrieval of the phonological representation from the lexicon takes longer than the existence of the visual information in short term memory, longer or repeated fixations of words may be needed to provide adequate visual information and to keep it fresh.

The looser graphic and phonological association and the short life time of visual information in iconic storage may contribute to the high correlation between graphic similarity and reading time for readers of English as a second/foreign language (see Figure 2 on page 65). Moreover, where Chinese readers are concerned, the high abstractness of the phonological representation and lack of it on the surface structure of ideograms in Chinese language must be taken into consideration. This phenomenon may result in a highly loose graphic and phonological representation, even in Chinese language. For example, the PEOPLE'S DAILY reported that a Chinese TV announcer mispronounced a word three times successively in a month, though the mispronunciation does not mean that he did not understand the word. This particular word, like many others in Chinese, has two phonological representations: /xing/ and /hang/, each of which is associated with different semantic and syntactic representations. When the Chinese readers mainly resorted to graphic cues in reading, this highly loose graphic and phonological association might have caused especially difficult problems for them. As a result, it took longer for them to read aloud the text than readers of English as a second language from alphabetic

orthographic and linguistic backgrounds.

The relationship between high graphic similarity and number of miscues (Figure 3) might be the product of the conflict between articulating words at a high speed in reading aloud and the time lag in retrieving the phonological representation using only visual information in a

Figure 3. A comparison of graphic similarity and number of miscues
 Note: Graphic similarity = , Number of miscues =

bottom-up process. For example, the Chinese readers read at a speed of about 80 words per minute, while the Spanish readers read at a speed of 133 words and the English readers at a speed of 153 words per minute. Reading aloud fluently places a constant demand on the reader. He/she has to extract visual information from the text, and retrieve phonological, syntactic and semantic representations from the lexicon, before he/she

synthesizes all of them to make sense out of the text. Of course, the most demanding task is to vocalize the text without unreasonable stopping. Under this pressure, a reader may vocalize a word without predictions and without adequate graphic information, or vocalize a word he/she predicts in the context with minimum graphic information. There are two factors that might have caused the Chinese readers to produce more miscues than the Spanish and English readers: their reliance on graphic cues without enough context predictions, and the prolonged time lag in retrieving the phonological representations.

A within-group correlation (TABLE IX) provides detailed information about the relationships between high graphic similarity and other variables. It is striking that within the Chinese group only the correlation of high graphic similarity with time spent in reading had a positive value, while the rest had a negative value. This seems to indicate that among the Chinese readers more reliance on graphic cues could reduce the number of miscues,

TABLE IX

WITHIN-GROUP CORRELATIONS OF HIGH GRAPHIC SIMILARITY
WITH VARIABLES MEASURED WITH OTHER MEASUREMENTS

	Reading Com- prehension	Time Spent in Reading	Miscues per 100 words	Miscues per 100 Unfamiliar words
CHN	-0.649	0.38	-0.3	-0.998
SP	0.326	0.748	0.725	0.364
AMCHN	0.946	0.49	0.998	0.00

----- (Y) Graphic
Similarity

whereas among the alphabetic readers more reliance on graphic cues increased the number of miscues. When the positive correlation of high graphic similarity and time spent in reading was considered, it is clear that the Chinese readers extracted more adequate and detailed graphic information for accurate pronunciation at the cost of reading speed. Though longer or repeated fixations might reduce the number of miscues, they perhaps hindered the comprehension process at the schematic level, because the reading comprehension scores were lowered as the graphic similarity increased. In the bottom-up process, the capacity of short term memory becomes a bottle-neck, which becomes narrower as the reading speed is slowed down. Moreover, the amount of attention focused on the perceptual level might have greatly reduced the Chinese readers' attention on the schematic level in reading. As a result, the incoming information from the target words in the text was not meaningfully structured in the bottom-up process, before this information was lost in short term memory and before the reader was rushed to continue reading.

As for the alphabetic language readers, research evidence showed that less skilled native readers of English were more reliant on visual strategies than skilled native readers (Barron, 1981). Evidence from this study also indicated that the Spanish and English readers' excessive employment of graphic information was accompanied by an increased number of miscues. This was in agreement with previous studies. Such evidence was supported theoretically by specialization of hemispheric functions in processing visual and verbal stimuli.

In the medium-level text, there were three sentence structures that could not usually be predicted from the previous context.

Special structures:

(1) The most serious deficiency of the AUTOBIOGRAPHY is the image of Franklin as "Poor Richard" *that it* is likely to project.

(2) ... and so *is* "There's more old drunkards than old doctors," ...

(3) There is no doubt but that *had he* so desired, ...

If a subject was more dependent on graphic cues, he was less likely to produce miscues in these structures than subjects who read actively and made more predictions based on the previous context. The readers' responses to these target structures indicated in some way the extent to which the readers employed graphic cues and context in their reading. A comparison of these miscue responses (TABLE X) supported previous discussions that the Chinese readers tended to read word by word with fewer predictions based on the context of the text, compared with Spanish and English readers.

TABLE X
MISCUES PRODUCED FOR THE SPECIAL STRUCTURES

	STR (1)	STR (2)	STR(3)	Total No. of Mis.	Group Mean	Percentage
CHN	0	1	0	1	0.5	16.7%
SP	2	3	3	8	2.7	88.9%
AMCHN	2	1	1	4	1.33	44.5%

Note: Only two Chinese subjects read this text.

Though an examination of graphic similarity did not reveal a significant quantitative difference in employment of graphic cues among the three groups, evidence from comparisons of the relationships between high graphic similarity with other categories of RMI and with variables measured with other measurements showed some qualitative difference in using graphic cues in reading aloud. The Chinese readers were more reliant on graphic cues, reading word by word with fewer predictions based on context. This was also supported by their responses to some special structures in the text. In reading English as a second/foreign language, their reliance on graphic information reduced the number of words read per minute, increased the number of miscues produced, and hindered reading comprehension when compared with the Spanish and English readers. Even within the Chinese group, reliance on graphic cues reduced the number of miscues at the cost of reading speed and comprehension.

Nevertheless, the insignificant quantitative difference may result indeed from the difficulty in measuring quantitatively the graphic and phonological difference of miscues in an alphabetic language like English. For example, it was easy to measure the graphic and phonological difference when "apostle" was read as /əpoustl/ instead of /əpousl/, but difficult to decide the graphic and phonological difference when "keen" was read as /kni:/ instead of /ki:n/, though the latter word might provide a strong graphic motivation for /kni:/ rather than a phonological motivation.

The quality of graphic miscues is also a key in measuring the quantitative difference between graphic and phonological cues. Individual readers may employ graphic and phonological cues in different ways, depending on their style of cognitive functions. In this study, evidence

showed that a Chinese reader, ZQ, who was an artist, was heavily reliant on graphic cues, but his graphic similarity did not rank at the top of his group as measured by RMI with modified criteria which were supposed to be more sensitive than the original criteria. The following are several examples of his miscues in italic:

- a. ... most or many important matters *and* judged (target: are).
- b. ... *it is need to be* ... (target: this need not be).
- c. Comparison with a *Grammar* home ... (target: German).

In these examples, there are stronger graphic motivations than phonological, syntactic and semantic motivations for those miscues made. As an artist, ZQ might have a well developed cognitive mechanism for visual images. However, the coordination of the mechanism with cognitive functions for verbal stimuli was so poor that the graphic cues exploited in reading were too abstract to provide adequate graphic information to activate appropriate phonological representations. His reliance on graphic cues also overshadowed possible use of context.

It was very difficult to measure these miscues quantitatively. If they were extended to include these miscues, the criteria might code all miscues as graphically similar, and otherwise they were not sensitive enough to code these miscues as high graphic similarity. In short, the characteristics of an alphabetic language, such as English, may not facilitate a quantitative measurement of graphic and phonological differences in miscues.

Findings relevant to hypothesis (2): Hypothesis (2) stated that Ideographic language (Chinese) readers may rely less on phonological cues than alphabetic language (Spanish and English) readers in reading English as

a second/foreign language, if they read English the way they read Chinese; phonological cues are defined as sound similarity measured by RMI as miscues, and defined as miscues of high sound similarity measured by other measurements adopted in this study.

Contrary to the hypothesis, a comparative study of sound similarity of the miscues coded in RMI (Figure 4) showed that Chinese ESL/EFL students produced slightly more miscues of high sound similarity than both the Spanish readers and mono-literate American Chinese, slightly more partial sound similarity than monoliterate American-Chinese readers, but

Figure 4. A comparison of mean sound similarity among the three groups

less than the Spanish readers. When the mean of high and partial sound similarity is considered, the difference does not seem quantitatively significant, because the Chinese subjects produced only 0.5 percent more such miscues than did the Mono-literate American-Chinese. A comparison of the group mean of high and partial sound similarity miscues indicated that Chinese subjects made 3.74 percent more miscues than the mono-literate American-Chinese, but 1.19 percent fewer than the Spanish readers. The difference in range and standard deviation is shown in TABLE XI. These results suggested that the Chinese readers were also reliant on phonological cues, in addition to graphic cues, in reading English as a second/foreign language. First comes the concern whether it is possible to measure the difference between graphic and phonological differences, though it might be very difficult as discussed in the previous section. In Chapter III, the possibility of measuring the difference was discussed from the perspective of letter-to-sound correspondence with both theoretical and empirical

TABLE XI

CENTRAL TENDENCY & VARIABILITY OF GROUP-MEAN OF SOUND SIMILARITY

	Mean	Range	Standard Deviation
(Y) Sound Similarity	23.26	16.1	7.4
(P) Sound Similarity	33.43	21.47	10.75
Mean of (Y) and (P)	28.34	4.93	2.09

assumptions (Chomsky, 1965; Chomsky and Halle, 1968; Venezky, 1970). In this chapter the focus will be on the perspective of word recognition.

If the Chinese reader took a holistic approach, a word would be identified by its graphic features. Of course, graphic features of English words are not as salient as those of Chinese ideograms in the whole-word approach. For instance, the envelope features of the word "salient" may be identified as salient. Such graphic information without outstanding features of the vowel letters may be inadequate to specify the appropriate phonological representations, because words like "silent" and "select" also have similar envelope features: silent and select. This might provide an explanation to a general finding that there is high error rate on vowels in reading while they are seldom misheard in listening (Shankweiler and Liberman, 1972). Graphic cues without adequate information of vowel letters did specify phonological representations deviant from those of the target words in this study. A Chinese reader, RZ, read "conduct" as "contact", which shared similar envelope cues: conduct and contact. Another Chinese reader, SW, identified "signing" as "singing", which also have similar envelope cues: signing and singing. There were cases where Spanish and English readers took this holistic approach too. For example, PT, a Spanish reader, read "failing" as "falling". CC, an English reader, read "hardworking" as "hardwalking". These miscues all have similar envelope cues, but miss part or most of the phonological representations. It is clear that these miscues have high graphic similarity, but not necessarily phonological similarity. The coding criteria adopted were based on syllables for multisyllabic words and on phonemes for monosyllabic words. They were sensitive enough to code the above miscues phonologically as

partial similarity or non-similarity, though they shared high graphic similarity.

An explanation for Chinese readers' comparatively greater reliance on phonological cues suggested here is that the array of English words may trigger and facilitate reading with phonological cues, while the configurations of Chinese ideograms may not. The main difference between Chinese ideograms and English words lies in the plane square pattern of the former and the linear sequential pattern of the latter, as far as visual configuration is concerned. The graphic, semantic, syntactic and possible phonological information of a Chinese ideogram are spread in a plane square from top to bottom, from the left to the right, from the inner to the outer or vice versa. This spatial configuration may require or facilitate a holistic approach, because linear-order analysis of the features of a Chinese ideogram is difficult. On the other hand, the array of an English word is linear, formed by letters, letter clusters, and syllables arranged from the left to the right without exceptions. This linear order of letters, letter clusters and syllables may facilitate a linear-order processing. A general claim of recent models of reading in English or alphabetic languages is that the word recognition patterns in the visual input may depend on a hierarchical organization of subprocesses (Jackson and McClelland, 1981). These subprocesses are linear in nature. In a linear analysis of letter array, a fragment and a fragment of letters serve as the input to a recognition of patterns at a higher level: the letter clusters or syllables; in turn this level provides information to the recognition of patterns at the next level: the word level. This can be illustrated in Figure 5 on the next page.

Research evidence supports this recognition pattern. In Mewhort and Beal's study (1977), subjects' performance was better and more accurate with cluster/syllabic groups than with non-cluster/nonsyllabic groups, when letter groups corresponding to syllables: in-dus-try, spe-ci-fic, etc., and letter groups not corresponding to clusters/syllables: ind-ust-ry, sp-ec-if-ic, etc., were presented to them.

Evidence in this study also fit into this recognition pattern. There were partial word miscues disrupted and continued in a syllabic or cluster pattern, for example, Frank--Franklin, jeo--jeopard---jeopardized, etc. This kind of miscue was produced by the Chinese, Spanish and English readers. Statistical evidence (TABLE XII, on the next page) showed that the Chinese readers did not make more partial word miscues that did not fit into the letter cluster/syllable pattern than did the Spanish readers.

Figure 5. A model of linear subprocesses in hierarchical word recognition

TABLE XII

A COMPARISON OF PARTIAL WORD MISCUES

Group	Total No. of PWM	No. of Nonsyllabic/cluster PWM	Percentage
CHN	27	3	11%
SP	20	3	15%
AMCHN	19	1	5.3%

Note: Letter clusters/syllables were identified according to Longman Dictionary of Contemporary English (1978). PWM = partial word miscues

In short, theoretically and empirically, measures adopted in this study did measure the graphic and phonological differences in miscues. The Chinese readers' reliance on phonological cues may be triggered and facilitated by the linear order of graphic and phonological information in the structure of English words.

The within-group correlation (TABLE XIII, on next page) showed that the Chinese and Spanish readers shared a pattern: high negative correlations between sound and grammatical functions, while the American-Chinese readers had a strong positive correlation. The American-Chinese readers probably better exploited the context with their native or near native knowledge of the language so that the miscues made were more grammatically appropriate than those made by the Chinese and Spanish readers.

TABLE XIII

WITHIN-GROUP CORRELATION OF MEAN OF HIGH AND PARTIAL
SOUND SIMILARITY WITH OTHER CATEGORIES IN RMI

	(Y) Graphic Similarity	(Y) Grammatical Function	
CHN	0.78	-0.71	
SP	0.45	-0.90	(M) Sound
AMCHN	0.79	0.53	Similarity

The correlation between mean sound similarity with the mean measured by non-RMI measurements (TABLE XIV) showed a general pattern: more miscues of sound similarity went with lower reading comprehension scores but with longer reading time and more miscues. Even high sound similarity miscues increased with reading time and the number of miscues, although it was positively correlated. The relationship of partial sound similarity miscues with reading time and the number of miscues was not clear. An explanation suggested here is that partial word miscues were not only associated with the phonological representation of a word, but also associated with the eye movement and use of syntactic rules in reading. For example, when a partial word miscue "join" was made out of "joining" or "mora" (/moræ/) out of "moralists", they were coded as partial sound similarity according to the criteria in this study. In the lexicon of a poor reader, the first miscue is a complete entry with phonological and graphic representations, but "-ing", "-ed", etc. are grammatical morphemes as

TABLE XIV

CORRELATIONS OF SOUND SIMILARITY WITH VARIABLES
MEASURED WITH OTHER MEASUREMENTS

	Reading Com- prehension	Time Spent in Reading	Miscues Per 100 Words	Miscues Per 100 Unfamiliar Words
Sound S (M)	-0.94	0.43	0.32	0.75
(Y) Sound S	0.896	0.37	0.40	0.036
(P) Sound S	-0.97	-0.09	-0.15	0.30

Note: (M) = mean of (Y) and (P)

separate entries. The phonological representation of a complete entry like "join" is activated sooner and articulated, and that of grammatical morphemes is activated later. In this situation, there is either a pause between "join" and "-ing", and "mora" and "-list" or "-lity", or the first part is repeated with the second part. This kind of partial word miscues may not reflect a generally loose graphic and phonological association in the lexicon; therefore, these partial word miscues do not increase or decrease with other kinds of miscues or the reading time.

The within-group correlation (TABLE XV) might provide an insight into the Chinese readers' strategies and problems in reading English as a second/foreign language. There was a strong tendency among the Chinese readers to make fewer miscues if they relied more on phonological cues. However, they read more slowly if they did so. Whether they have a mastery of the letter-to-sound knowledge and fully use it is important, because without this knowledge it would be difficult for them to read English.

TABLE XV

WITHIN-GROUP CORRELATION OF MEAN OF (Y) & (P) SOUND SIMILARITY
WITH VARIABLES BY OTHER MEASUREMENTS

	Reading Com- prehension	Time Spent in Reading	Miscues Per 100 Words	Miscues Per 100 Unfamiliar Words
CHN	0.16	0.46	-0.92	-0.68
-----Sound				
SP	-0.70	0.93	0.96	0.22
-----Similarity				
AMCHN	-0.54	-0.29	0.97	0

In the medium level reading text, there are seven words that require higher level knowledge of phonology and orthography to decide the letter-to-sound pattern, or to segment morphological and phonological boundaries. Subjects' responses to these words might demonstrate their sensitivity to these boundaries, and their analytical ability to handle them.

It is clear that the Chinese readers' performance with these words was much poorer than that of the Spanish and English readers. This was expected, following evidence from clinical and experimental research discussed in Chapters II and III. The Chinese readers may take a holistic and visual approach to the recognition of Chinese ideograms. According to the specialization of function of the hemispheres, such an approach may depend on the cognitive functions of the right hemisphere. The analytical ability to deal with verbal stimuli is generally believed to be located in the left hemisphere. When the Chinese readers read English as a second/foreign language, they might take an analytical and rule-based approach to the

language, but their cognitive functions might not be competent for this task. In addition, the letter-to-sound rules in English work at the surface level in some cases, but at a somewhat abstract level in other cases, such as the words in TABLE XVI. This of course makes it difficult for the Chinese reader to vocalize them correctly.

TABLE XVI
SUBJECTS' RESPONSES TO SPECIAL WORDS

	CHN	SP	AMCHN
threshold	1	1	1
apothegm	2	1	0
apostle	2	1	1
guise	1	0	1
signing	1	1	0
intrigue	2	0	1
fatigue	2	0	1
Total No. of Miscues	11	4	5
Percentage	78%	19%	24%

Note: only two Chinese subjects read the medium level text.

Findings relevant to hypothesis (3): Hypothesis (3) stated that ideographic language readers' responses to unfamiliar words in the reading text would be more often miscues than are alphabetic language readers' responses.

The result from this study showed that the Chinese readers did make more miscue responses to unfamiliar words than the Spanish and English readers (TABLES XVII, and XVIII) as was hypothesized.

TABLE XVII
CENTRAL TENDENCY AND VARIABILITY OF MISCU
RESPONSES TO UNFAMILIAR WORDS

Mean	Range	SD
30.38	29.1	9.81

Note: in percentage.

TABLE XVIII
A COMPARISON OF THREE GROUPS' RESPONSES TO UNFAMILIAR WORDS

Group	Unfamiliar Target Words	Miscue Responses	Percentage of Miscues
CHN	49	22	44.9
SP	16	5	31.3
AMCHN	19	3	15.8

In handling familiar words, readers may resort to a lexical or graphemic mechanism to retrieve the phonological representation in the mental lexicon. Even the Chinese readers did so, as supported by evidence from this research. The speed and accuracy of the retrieval depends on the association between the graphic and phonological representations. The evidence that the Chinese readers read most slowly, while the American-Chinese read fastest supported this hypothesis.

When processing unfamiliar words, two different mechanisms may be involved (Glushko, 1981; Katz & Feldman, 1981). One of them may employ the letter-to-sound rules to generate a pronunciation for the unfamiliar word, and the other may use an analogy approach by comparing it with familiar words. To decode an unfamiliar word with the letter-to-sound rules, or grapheme-phoneme correspondence rules as they are usually called, the Chinese readers may face two problems: (1) they need to switch from the right hemisphere to the left hemisphere, and (2) they need to deal with English phonological rules that work at a somewhat abstract level.

The right hemisphere is usually specialized in processing imagery stimuli. The configurations of Chinese ideograms may be better approached by the right hemisphere with holistic and visual coding. The left hemisphere, on the other hand, is specialized in processing verbal materials with an analytic approach. When the Chinese readers read the unfamiliar words, they may have to use an analytic approach. Research by Samuels and LaBerge (1983) indicated that skilled native readers of English use smaller visual units, that is, dividing a word into smaller units, when they encounter unfamiliar words. If the Chinese readers read the unfamiliar words this way, they had the problem of segmentation of these unfamiliar words

into smaller units. The segmentation of unfamiliar words into smaller visual units involves not only the visual functions but also the syllable and morpheme boundaries in English words. The latter requires the application of letter-to-sound rules. In English, single-letter-to-sound rules apply only in some cases, while in most cases the knowledge of abstract rules is needed. The Chinese readers were not sensitive to the boundaries, as a result of lack of the grapheme-phoneme correspondence rules at an abstract level.

In the analogy approach, readers activate all neighboring words of similar grapheme structures when they encounter an unfamiliar word. Still, there was the problem of segmentation of an unfamiliar word for the Chinese readers. For example, when a Chinese reader in this study encountered the word "apo**th**egm", he needed to decide whether the "th" was pronounced as in "ligh**t**house" or as in "sympa**th**y".

The above discussion shows that whatever approach the Chinese readers took in handling an unfamiliar word in reading, they could not avoid segmenting the unfamiliar word. Segmentation requires the knowledge of grapheme-phoneme correspondence rules and the analytic ability of the left hemisphere to deal with it. The Chinese readers lacked the former, and were in the process of switching for the latter. This caused problems for them to approach correctly the unfamiliar words in the text. The existence of this problem was supported by the significantly large percentage of miscues for unfamiliar words.

It is worth mentioning here that a within-group comparison (TABLE XIX) showed that within each group there was a very different correlation pattern. The correlation pattern for the Chinese was unusual. It is easy to

TABLE XIX

A WITHIN-GROUP CORRELATION OF MISCUE RESPONSES TO
UNFAMILIAR WORDS WITH SOME RMI VARIABLES

(Y)Graphic S. Mean of (Y) & (P) Sound S. Miscues per 100 Words			
CHN	-0.998	-0.68	0.37
SP	0.36	0.22	0.94
AMCHN	0.00	0.00	0.00

-----Unfamiliar
Words

understand the negative correlation between the number of miscue responses to unfamiliar words and sound similarity, because poor users of phonological cues could make more miscue responses in decoding unfamiliar words. However, it is not clear why it also negatively correlated with graphic similarity. The only explanation suggested here is that this might be brought about by some individual cognitive styles, since the sample was very small.

In conclusion, hypotheses (1) and (3) were supported by evidence from this study both quantitatively and qualitatively, though the evidence supporting hypothesis (1) was quantitatively weak. Hypothesis (2) was both quantitatively and qualitatively rejected by the research evidence. This result indicated that the Chinese readers employed phonological cues in their reading, while they were still reliant on graphic cues as well. This might be a problem Chinese ESL/EFL students have in switching from reading an ideographic language to an alphabetic language.

CHAPTER V.

CONCLUSION

In this chapter, the methods adopted and the hypotheses are reviewed. General conclusions made from the findings are presented and their implications for teaching reading English as a second/foreign language to Chinese students are discussed. The limitations and methodological problems are also considered.

A SUMMARY OF THE FINDINGS

The purpose of this study was to examine the script effects of Chinese language on Chinese students' reading strategies. In this study, three groups ESL/EFL students, educated Chinese readers, educated Spanish readers, and mono-literate American-Chinese, were used. Each group had three subjects, and the total number was nine. The major measurement was a modified RMI, supplemented with measures of other variables.

Hypothesis (1) stated that ideographic language (Chinese) readers may rely more on graphic cues than alphabetic language (Spanish and English) readers in reading English as a second/foreign language, if they read English in the way they read Chinese; graphic cues are defined as graphic similarity measured by RMI as miscues in this study.

Findings relevant to hypothesis (1);

1). A comparison of the mean percentage of both high and partial graphic miscues produced by each of the three groups did not show significantly quantitative difference among the three groups ($R = 7.04$, $SD = 2.79$), although the graphic similarity for the Chinese group was a little higher than for the other two groups.

2). The slight quantitative difference might suggest some qualitative difference. This was supported by the following:

a. A within-group negative correlation of -0.999 of graphic similarity with grammatical function showed a strong tendency that the more graphic cues a Chinese subject relied on, the more the grammatical function of miscues deviated from the target word.

b. A within-group comparison revealed that the Chinese readers' graphic similarity positively correlated with reading time ($r = 0.38$), but negatively correlated with miscues per 100 words ($r = -0.30$), miscues per 100 unfamiliar words ($r = -0.998$), and reading comprehension ($r = -0.52$);

c. The Chinese readers made significantly fewer miscues (16.7%) than the Spanish readers (88.9%) and the English readers (44.4%) did for three structures that are less likely predicted in the context.

3). The Chinese readers seemed to demonstrate more individual cognitive approaches to the print than the Spanish and English readers. This was supported by the following:

a. Within the group of the Chinese readers, graphic similarity did not positively correlate with miscues per 100 words and unfamiliar words.

b. One of the Chinese readers, ZQ, used very abstract and vague graphic cues that were not within the range of the sensibility of the coding

criteria adopted in this study.

Hypothesis (2) stated that ideographic language (Chinese) readers may rely less on phonological cues than alphabetic language (Spanish and English) readers in reading English as a second/foreign language, if they read English the way they read Chinese; phonological cues are defined as sound similarity measured by RMI as miscues, and defined as miscues of high sound similarity measured by other measurements adopted in this study.

Findings relevant to hypothesis (2):

1). A comparative study of sound similarity of the miscues coded in RMI showed that Chinese ESL/EFL students' mean miscues of high and partial sound similarity were slightly fewer (2.4%) than the Spanish readers', but more (7.5 %) than mono-literate American Chinese readers'.

2). Evidence that the Chinese readers were also reliant on phonological cues was supported by the following:

a. The Chinese readers made fewer (4%) partial word miscues, which did not fit into the pattern of letter clusters or syllables, than did the Spanish readers,

b. The Chinese readers' sound similarity had a negative correlation with miscues per 100 words ($r = -0.92$) and unfamiliar word ($r = -0.68$) when compared with themselves.

3). The Chinese readers, however, were not yet skilled users of phonological cues, as indicated by the evidence that they were not sensitive to morpheme/syllable boundaries of English words, especially at the abstract level(78% miscues).

Hypothesis (3) stated that ideographic language readers' responses to

unfamiliar words in the reading text would be more often miscues than are alphabetic language readers' responses.

Findings relevant to hypothesis (3):

1). The Chinese readers' miscue responses (44.9%) to unfamiliar words were significantly more than the Spanish readers' (31.3%) and American-Chinese readers' (15.8%).

CONCLUSIONS FROM THE FINDINGS

In switching from reading an ideographic language--Chinese to that of an alphabetic language--English, the Chinese readers experienced some difficulties in adjusting their reading strategies. They were still reliant on graphic cues, and at the same time they had to use phonological cues in reading an alphabetic language like English, at the perceptual level. At the schematic level, they mainly depended on the bottom-up process with few contextual predictions.

A general theoretical assumption for a large proportion of the following discussion concerning word recognition is that inner speech takes place in Chinese readers' reading process, when findings in oral reading are related to silent reading (Conrad, 1964; Banks, et al. 1981). This inner speech may be at the level of subvocalizing or phonemic coding (Baddeley and Lewis, 1981). The structure of English words may trigger this kind of processing (see pages 76-77 for detailed discussion), in addition to the possible effects on short term memory.

In the recognition of words, the Chinese readers still employed heavily graphic cues as indicated by evidence in this study. If they took the

lexical approach, they faced a problem of the association between graphic and phonological representations. When the graphic information is used to retrieve the phonological representation in the lexicon, a time lag exists before it is activated (Glushko, 1981). The speed of phonological activation by graphic information may depend on the association between graphic and phonological representations in the lexicon. Barron (1981) found that less skilled readers could not activate the phonological representation as fast as skilled readers, even when they were native speakers of English. In Chinese language, the association between phonological and graphic representations is relatively loose, because only a small proportion of the Chinese vocabulary has phonological representation on the surface structures of the ideograms. This phenomenon does not facilitate the association between graphic and phonological representations for Chinese readers when they learn English. In addition, this association was usually weak for non-native speakers like the Chinese readers in this study, because they might have learned the language without exposure to correct phonological representation, or without enough exposure to phonological representation. This was because they mainly learned how to read the language silently, but not to speak and listen, since most of the Chinese college English programs concentrate on an intensive reading program only. Therefore, the students are usually described as "deaf" and "mute"; that is, they can not listen to nor speak English, when the problem of this English program is discussed. This loose graphic and phonological association resulting from the ideographic structure of Chinese words and the way English was learned greatly increased the time needed to vocalize or subvocalize the text.

When reliant on graphic cues, the Chinese readers probably took a

holistic and visual approach to identify a word by its graphic features. The problem they encountered was that the graphic features of English words are much less salient than those of a Chinese ideogram. An English word could be identified as an envelope cue, when the graphic information entered as a gross image (Haber and Haber, 1981, and Henderson, 1982). In this envelope cue, only the graphic features of consonant letters are salient, while the graphic features of vowel letters are obscure. Without the information of the vowel letters, it is easy to misread a word, as the Chinese readers did for some words in this study. This holistic and visual, or whole word, approach to an alphabetic language might increase the Chinese readers' miscues in reading.

In the letter-to-sound or grapheme-phoneme correspondence approach of word recognition, the Chinese readers had a problem of mapping the letters to the phonological representations of words. English is an alphabetic language, but its phonological representation is abstract (Chomsky, 1965, and Chomsky and Halle, 1968). Its phonological representation is mapped at an intermediate level with grapheme units which can be letters or letter clusters (Venezky, 1970). Because the configurations of Chinese ideograms are generally not phonologically rule-based, the Chinese readers were not sensitive to the boundaries between such units, and made more miscues when the grapheme unit or syllable boundaries were ambiguous. It might have taken longer time for them to segment such boundaries.

This insensitivity brought about a problem for the Chinese readers in vocalizing and in visually recognizing English words in the way they approached the Chinese words. The configurations of Chinese ideograms are

not subject to a linear analysis in reading, because the structure of information on the plane square is not regularly ordered, but multi-directional. This structure, of course, facilitates a holistic approach. The structure of an English word is linear, letters arranged from the left to the right. Letters form clusters or syllables, and they, in turn, form a word from the left to the right. Within this three-level hierarchical structure of a word, information is linearly ordered (see Figure 5, p. 77). This linear-ordered information greatly facilitates a linear ordered analytical approach in word recognition. When the Chinese readers read the English texts, it was possible that they found that the analytic approach was more efficient and accurate in recognizing English words. In adopting this approach to graphic cues, they also needed to apply the letters-to-sound rules to segment the graphic information into meaningful visual units, because a fixation can capture only a limited number of letters. They succeeded when the grapheme-phoneme correspondence rules were simple, but failed when they were abstract, as indicated by their production of partial words and responses to unfamiliar words. This might indicate that they were still not good at adjusting visual units according to the task. This is the difference between a poor reader and a skilled reader, as Samuels and LaBerge (1983) discovered in their study.

At the schematic level, the Chinese readers seemed to rely generally on the bottom-up process in reading. In the schema theory, two basic modes are involved in processing information: bottom-up and top-down (Carrell and Eisterhold, 1983). In the bottom-up process, incoming information from the text evokes a hierarchical organization of the data for a better interpretation. In the top-down process, predictions are made, based on

high level general knowledge, and information is located and sorted in the text to support or reject the predictions. An ideal reading process is simultaneous activation or continuously alternating application of these two processes. In such a process, minimum graphic cues are utilized when the information is best organized and understood.

When the Chinese readers read with too much reliance on the graphic cues, either they were not able to make a prediction because of the lack of adequate linguistic and cultural background knowledge, or they were reliant on the graphic cues for necessary phonological, syntactic and semantic information, or both cases were true for them. Only the second situation, the Chinese readers' reliance on graphic cues, is considered here, when they are compared with the Spanish readers, since both groups of ESL readers might have suffered from lack of linguistic and cultural background knowledge. The Chinese readers made significantly fewer miscue responses than the Spanish readers, where the structures were difficult to be predicted in the context. The considerable number of the American-Chinese readers' miscue responses to the special structure is a good index of the difficulty level of the structures. A logical explanation offered here is that the Chinese readers read word by word, using maximum graphic cues.

A problem in interpreting this phenomenon is determining which was the cause and which was the effect. Difficulty in employing the bottom-up and top-down processes simultaneously or alternatively in reading may cause maximum use of graphic cues, whereas too much reliance and attention on graphic cues may result in the inability to activate a general schema to guide the reading and interpretation. Where the Chinese readers were concerned, they might have faced both problems. The former might

have resulted from inadequate training in reading skills from the programs they participated in back in China. The latter might have resulted from the cognitive approaches they took in reading a language that does not facilitate these approaches. As discussed in the above sections, their holistic and visual approach in identifying English words is not efficient because of the nature of alphabetic scripts and the structure of information in an English word, nor is their analytic approach, for the grapheme-phoneme correspondence rules in English apply at an abstract level in most cases. The need for maximum graphic information and the amount of attention in extracting the graphic information to map to the phonological representation reduce the possibility to generate a higher level schema and to make predictions in constant reading. It takes longer for the poorly preorganized in-coming information to be organized to a high level, and the poor organization impairs understanding because of the limited capacity of the short term memory. This might have caused the Chinese readers to reread a sentence or paragraph in silent reading for a better understanding.

The American-Chinese readers' performance was better than that of the other two groups, viewed from the number of miscues, the time spent in reading and the understanding of the text. Their reading behavior was different from the Chinese readers', as compared in relevant sections in Chapter IV. Their reading behavior was almost the same as the Spanish readers, where reading time and contextual predictions were concerned. The reading time is a good index of cognitive approach to the recognition of English words, in addition to the graphic and sound similarity. This difference might support the general hypothesis that the mono-literate or semi-mono-literate American-Chinese were not influenced by script effects,

as native readers of English , or in other words that the Chinese readers were influenced by script effects, as a result of reading the ideographic language as their native language.

The Spanish readers read much faster, made more contextual predictions and fewer miscues than the Chinese readers, but their reading comprehension was poorer than the Chinese readers. The reasons for their poor comprehension are beyond the scope of this study, but this phenomenon may stand out as a style of cognitive approach in reading. It may be easier for them to read aloud an alphabetic language than the Chinese readers, though they may not understand it well.

LIMITATIONS OF THIS STUDY

Strong generalizations cannot be made from the findings in this study, because of limitations that come from two aspects: research design and the sampling of subjects.

First, the generalization of the findings can only be applied to the hypothesis that the Chinese readers' reading strategies were probably influenced by script effects, since their cognitive approaches were different. Such findings may not be generalized to support neuropsychological theory, or clinical and laboratory experimental evidence that script effects result from different hemispheric functions in processing Chinese ideograms, because in this study the independent variable, script effects, can not be directly and experimentally manipulated, as is typical of causal-comparative research.

Second, the sample was not randomly selected, and the size of the

sample was small. This might result in a situation where the cognitive approaches and the reading strategies may not be representative of the population of any of the three orthographic and linguistic groups, especially the Spanish reader group and the mono-literate American-Chinese group. As a Chinese EFL teacher with ten years' teaching experience, the researcher empirically believes that the findings from this study do reflect the problems Chinese ESL/EFL readers have, and the way they read English as a second/foreign language. However, this small sample made it difficult to use inferential statistics, and to make strong claims regarding the population, in the strict sense.

IMPLICATIONS OF THE FINDINGS AND SUGGESTIONS FOR FURTHER STUDY

The findings in this study involve reading at two levels: the perceptual level and the schematic level. With the theoretical considerations of the two levels, this study has implications for two approaches to teaching English as a second/foreign language to Chinese ESL/EFL students: an integrative approach and specific reading courses. It also provides a theoretical answer to the question concerning the reading programs in China: whether speaking and listening are essential to reading programs.

In the integrative approach, the curricula may need to include speaking, listening, writing and reading. In the classroom, a teacher needs to adopt a method that integrates the four skills of the language. Many Chinese EFL teachers believe that within the intensive reading program those who speak and listen to the language often generally read better than

those who do not. One learns new words better if he reads and spells them together. An explanation this study suggested is that speaking and listening may tighten the association between graphic and phonological representations in the lexicon in an extensive reading program where the students receive adequate information. Sounding a word out while spelling it also improves this association. A close association in the lexicon may facilitate both visual and phonological accesses to the representations. Generally speaking, two accesses to a word in memory are superior to one. When reading is concerned, the close association between graphic and phonological representations reduces the time lag in retrieving the phonological representation with graphic information in reading.

In this integrative approach to teaching and learning a language, letter-to-sound correspondence rules may be taught to beginners or intermediate readers explicitly or implicitly, or both. These rules can be integrated in written and listening exercises. A conscious or subconscious knowledge of these rules may help the students develop a strong sensitivity to such correspondence and the boundaries between morphemes/syllables in both visual and phonological approaches to words in reading.

In a reading course, two aspects--how one writes and how one reads--need to be taught instead of just reading. Discourse analysis must be included in a reading program. Discourse can be presented to students at two levels: complete articles or essays, and paragraphs. At the complete article level, students learn the patterns of description, argument, comparison, etc., and see how information is organized in English. At the paragraph level, patterns of paragraphs are presented to students, showing the positions of topic sentences, the supporting sentence, and their

difference in structure and content. Discourse analysis can provide a background for students to apply reading skills.

Students need to learn to read discriminately, according to their purpose of reading, and then apply different reading skills, such as scanning, skimming, etc.. For example, when they read for general information, they do not need to read word by word or sentence by sentence, but to skim and locate the topic sentences and conclusions. In this way, Chinese students can ultimately employ both bottom-up and top-down processes, freeing themselves from excessive use of graphic cues in word-by-word reading.

The integrative approach, as discussed above, is basic and long term. It helps students build their basic ability in a second/foreign language. The specific reading courses can be adopted as an advanced course in the integrative approach, and as a remedial courses for advanced students who are still not skilled readers in ESL programs in US and EFL programs in China.

Suggestions for further study in this field with RMI cover the problem of sampling and of reading texts. The sample of subjects must be randomly selected and be large enough to adopt inferential statistics so that stronger claim can be made of the influence of script effects on Chinese ESL/EFL students' reading strategies. Comparative studies can be conducted between Chinese students and any other alphabetic language readers and/or monoliterate American-Chinese to examine how they read at different levels of language proficiency. A large sample can include good readers and poor readers from the two orthographic and linguistic backgrounds to examine the strategies of good and poor readers, and the difference between good readers or poor readers from different orthographic backgrounds.

To achieve clear evidence, controlled and structured reading texts may be adopted. For instance, words that reflect a certain grapheme-phoneme correspondence rule or rules, or certain shapes can be arranged in a reading text in a certain frequency. Subjects' responses to these controlled words may indicate their cognitive approaches to such words or rules. Research like this may examine subjects' cognitive approaches at the perceptual level. As for the schematic level, certain sentence or discourse structures can be arranged in the text in certain frequency. For example, inversion or partial inversion, and object clauses with or without "that" etc.. may be structured in a reading text. This design may probe how students read at the schematic level. One point that needs to be made clear is that the reading text must appear natural. These research designs at the perceptual level and schematic may improve RMI's sensitivity to a greater degree.

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APPENDIX A

Appendix A includes the coding procedures (Goodman and Burke, 1972, pp. 42-48), and examples of miscues coded in this study following the modified procedures.

The following procedures will help the teacher in determining how to place the miscues on the Coding Sheet.

1. Insertions, omissions, substitutions, and reversals of a prefix, suffix, word, or intonation feature are coded as miscues regardless of whether they are subsequently corrected. Note the following examples.

MISCUE NUMBER	MARKED WORKSHEET
1	I looked up and had my first ^⑥ view of Claribel.
2/3	He could see ^{the white} a rabbit in the neighbor's backyard.
4	Taking the pictures down was his job.
5	The boy was picking ^{& canberries *} cranberries.
6	The small child looked at the horse.
7	The teenagers had a stack of ^{re cords} records.

The seven miscues are entered as follows in the first three columns of the Coding Sheet:

MISCUE NUMBER	Reader	Text
1	--	view
2	the	a
3	white	--
4	take	taking
5	& canberries	cranberries

Selecting Miscues for the Coding Sheet

2. When a partial word substitution is made and corrected, it is not keyed as a miscue and does not get placed on the Coding Sheet. When there is no correction, the partial word is treated as an omission miscue, and is entered on the Coding Sheet as follows:

MISCUE
NUMBER MARKED WORKSHEET EXAMPLES

none The group ^{dan-}danced
8 around the ^{s-}samovar.

Miscue
Number Reader Text

8	--	samovar
---	----	---------

3. When a reader makes repeated attempts on a word, the first complete word or non-word substitution is coded as the miscue. Note that each attempt is numbered.

MISCUE
NUMBER MARKED WORKSHEET EXAMPLES

9 Sven Olsen <sup>UC 3 discovered
2 decide</sup> decided he wanted one.
10 I could scarcely <sup>UC 2 dir - 3 drag
1 directly</sup> drag myself out of bed
11 It was a <sup>© 2 tropical
1 typical</sup> typical spring storm.

Miscue
Number Reader Text

9	decide	decided
10	directly	drag
11	typical	typical

4. Repeated attempts made on an item across text occurrences are handled in one of the following four ways on the Coding Sheet. All repeated

Guidelines for Coding Miscues

miscues will be tallied under the heading *Repeated Miscues* on the Reader Profile Sheet.

- (a) Each repeated omission and each repeated insertion are coded.
- (b) Each repeated substitution of a function word (articles, prepositions, conjunctions, phrase and clause markers) is coded.
- (c) Repeated *identical* substitutions of nouns, verbs, adjectives, or adverbs are coded only for the first occurrence when the text occurrences retain the same grammatical function.
- (d) Repeated identical substitutions of nouns, verbs, adjectives, or adverbs are coded separately each time the grammatical function of the word in the text changes.

MISCUE

NUMBER MARKED WORKSHEET EXAMPLES

- 12 He had a canary for a ^{pat}pet.
- none And he had a dog for a ^{pet}pet.
- 13 He would whistle ^{for}to his canary
- 14 and ^{pat}pet his dog. He took both
- 15 pets down (to)town.

Miscue

Number

Reader

Text

12	pat	pet
13	for	to
14	pat	pet
15	--	to

Selecting Miscues for the Coding Sheet

5. In some instances, an initial miscue causes the reader to make another miscue immediately thereafter. Where this strong interrelationship exists, the whole sequence is coded as one complex miscue on the Coding Sheet.

MISCUE NUMBER	MARKED WORKSHEET EXAMPLES
16	He could ^{have stayed} stay at home.
17	In no time at all ^{seven pets were} Sven's pet was everybody's pet.
18	The rest of us ^{he passed} passed around the oxygen bottle.

MISCUE NUMBER	Reader	Text
16	have stayed	stay
17	seven pets were	Sven's pet was
18	he passed	we passed

6. The following occurrences are generally not keyed as miscues:

- (a) The omission of whole lines of text.

Billy wanted to play

baseball. He went out

with his ball and bat.

- (b) Additional miscues which are made during a repetition.

Intellectual geniuses aren't

^{2 pitch}
^{1 partner}
always invited to participate

in ball games.

Note: Partner will be coded as the miscue, pitch will not be coded.

(c) Misarticulations.

nilolium
The kids used linoleum pieces

to make the baseball diamond.

(d) Sound variations which involve dialect.*

(d) git
He couldn't get into

(d) wit
the game with the big kids.

(e) Syllabication divisions within words.

He was a cute ⁺little boy.

She was a ⁺pretty little girl.

*If the teacher elects to mark dialect miscues which involve only sound variations, the miscue should be spelled as it sounds, retaining as much of the original spelling as possible (see *Marking the Worksheet*).

Reader SW

Date April 16 Selection medium-level

Miscue Number	Reader	Text	DIALECT 1	INTONATION 2	GRAPHIC SIMILARITY 3		
					Y	P	N
1	--	the					
2	complete	completely			✓		
3	thres/hold /θreshould/	threshold			✓		
4	restless	restless			✓		
5	absorb	absorbed			✓		
6	seriou-	serious			✓		
7	autibi + biography	autobiography					
8	complex	complexity			✓		
9	honest	homely				✓	
10	apo-	apothegms					✓
11	phis-	philosophical					✓
12	contact	conduct			✓		
13	commence-	commencement			✓		
14	McGuffey	McGuffey's			✓		
15	inspiration	inspirational			✓		
16	apottle /əpoustl/	apostle			✓		
17	by reasons	by reason			✓		
18	ab-	absurity					✓
19	guis /gwis/	guise			✓		
20	Franklin	Franklinian			✓		
21	au-	autobiography					✓
22	--	of					
23	fortune-	fortune				✓	
24	-- dis-	to disorderly					
25	join	joining				✓	
COLUMN TOTAL					14	3	4
PERCENTAGE					66.6	14.3	19
QUESTION TOTAL					21		

Teacher Zhou

Class

School

SOUND SIMILARITY 4			GRAMMATICAL FUNCTION 5			6	7	8	9	COMPREHENSION			GRAMMATICAL RELATIONSHIPS			
Y	P	N	Y	P	N					No Loss	Partial Loss	Loss	Strength	Partial Strength	Weakness	Overcorrection
✓					✓	N	Y	Y	N	✓	✓			✓	✓	
		✓	✓			N	Y	N	Y			✓			✓	
	✓		✓			P	Y	N	Y			✓			✓	
✓			✓			Y	P	P	P	✓			✓			
✓						Y	Y	Y	N	✓			✓			
	✓		✓		✓	Y	Y	Y	P	✓			✓			✓
		✓	✓			Y	Y	P	P	✓			✓			
	✓					Y				✓			✓			
		✓	✓			Y				✓			✓			
		✓	✓			N	Y	N	Y		✓		✓	✓		
✓					✓	Y	Y	P	P	✓			✓			
✓					✓	Y	Y	P	P	✓			✓			
✓					✓	N	Y	P	Y	✓		✓	✓	✓		
✓		✓	✓			Y	P	P	P	✓		✓	✓	✓		
		✓	✓			N	Y	N	Y		✓		✓	✓		
✓					✓	N	Y	Y	N	✓			✓			
		✓				Y				✓			✓			
						N	N	N	Y			✓			✓	
		✓				Y				✓			✓			
						Y				✓			✓			
	✓				✓	Y	P	P	P	✓			✓			
8	5	8	9	0	6	COLUMN TOTAL				18	1	6	16	4	4	1
33.1	23.8	38.1	60	0	40	PERCENTAGE				72	4	24	64	16	16	4
21			15			PATTERN TOTAL				25			25			

APPENDIX B

In Appendix B, data obtained from RMI are presented together with data obtained from non-RMI measurements.

In comprehension section:

= no loss.

= partial loss

= loss

In other sections:

= miscues

Reader: SW First Language (oral) Chinese; (written) Chinese

Text: Medium-level

Time Spent in Reading: 14'20"

Total Number of Miscues: 46

Miscues Per One Hundred Words: 4.07

Comprehension

SOUND/GRAPHIC RELATIONSHIPS					
Graphic			Sound		
High	Some	None	High	Some	None
100	100	100	100	100	100
90	90	90	90	90	90
80	80	80	80	80	80
70	70	70	70	70	70
60	60	60	60	60	60
50	50	50	50	50	50
40	40	40	40	40	40
30	30	30	30	30	30
20	20	20	20	20	20
10	10	10	10	10	10
0	0	0	0	0	0
66.6%	14.3%	19%	38.1%	23.8%	38.1%

GRAMMATICAL RELATIONSHIPS						
Function			Relationships			
Identical	Indeterminate	different	Strength	Partial Strength	Weakness	Overcorrection
100	100	100	100	100	100	100
90	90	90	90	90	90	90
80	80	80	80	80	80	80
70	70	70	70	70	70	70
60	60	60	60	60	60	60
50	50	50	50	50	50	50
40	40	40	40	40	40	40
30	30	30	30	30	30	30
20	20	20	20	20	20	20
10	10	10	10	10	10	10
60%	0%	40%	64%	16%	16%	4%

Reader: RZ

First Language: (oral) Chinese; (written) Chinese

Text: Medium-Level

Time Spent Reading in Reading: 13'55"

Total Number of Miscues: 35

Miscues Per One Hundred Words: 3.89

Comprehension

SOUND/GRAPHIC RELATIONSHIPS					
Graphic			Sound		
High	Some	None	High	Some	None
100	100	100	100	100	100
90	90	90	90	90	90
80	80	80	80	80	80
70	70	70	70	70	70
60	60	60	60	60	60
50	50	50	50	50	50
40	40	40	40	40	40
30	30	30	30	30	30
20	20	20	20	20	20
10	10	10	10	10	10
0	0	0	0	0	0
40.9%	27.3%	31.8%	22.7%	36.4%	40.9%

GRAMMATICAL RELATIONSHIPS						
Function			Relationships			
Identical	Indeterminate	different	Strength	Partial Strength	Weakness	Overcorrection
100	100	100	100	100	100	100
90	90	90	90	90	90	90
80	80	80	80	80	80	80
70	70	70	70	70	70	70
60	60	60	60	60	60	60
50	50	50	50	50	50	50
40	40	40	40	40	40	40
30	30	30	30	30	30	30
20	20	20	20	20	20	20
10	10	10	10	10	10	10
0	0	0	0	0	0	0
66.7%	0%	33.3%	48%	32%	20%	0%

Reader: ZQ

First Language: (oral) Chinese; (written) Chinese

Text: Lower-Level

Time Spent in Reading: 14'50"

Total Number of Miscues: 98

Miscues Per One Hundred Words: 8.18

Comprehension

SOUND/GRAPHIC RELATIONSHIPS					
Graphic			Sound		
High	Some	None	High	Some	None
100	100	100	100	100	100
90	90	90	90	90	90
80	80	80	80	80	80
70	70	70	70	70	70
60	60	60	60	60	60
50	50	50	50	50	50
40	40	40	40	40	40
30	30	30	30	30	30
20	20	20	20	20	20
10	10	10	10	10	10
0	0	0	0	0	0
45.8%	33.3%	20.8%	20.8%	33.3%	45.8%

GRAMMATICAL RELATIONSHIPS						
Function			Relationships			
Identical	Indeterminate	different	Strength	Partial Strength	Weakness	Overcorrection
100	100	100	100	100	100	100
90	90	90	90	90	90	90
80	80	80	80	80	80	80
70	70	70	70	70	70	70
60	60	60	60	60	60	60
50	50	50	50	50	50	50
40	40	40	40	40	40	40
30	30	30	30	30	30	30
20	20	20	20	20	20	20
10	10	10	10	10	10	10
0	0	0	0	0	0	0
65%	0%	35%	28%	24%	48%	0%

Reader: EM First Language: (oral) Spanish; (written) Spanish

Text: Medium-Level

Time Spent in Reading: 12'30"

Total Number of Miscues: 47

Miscues Per One Hundred Words: 4.15

Comprehension

SOUND/GRAPHIC RELATIONSHIPS					
Graphic			Sound		
High	Some	None	High	Some	None
100	100	100	100	100	100
90	90	90	90	90	90
80	80	80	80	80	80
70	70	70	70	70	70
60	60	60	60	60	60
50	50	50	50	50	50
40	40	40	40	40	40
30	30	30	30	30	30
20	20	20	20	20	20
10	10	10	10	10	10
0	0	0	0	0	0
57.9%	10.5%	31.6%	15.8%	52.6%	31.6%

GRAMMATICAL RELATIONSHIPS						
Function			Relationships			
Identical	Indeterminate	different	Strength	Partial Strength	Weakness	Overcorrection
100	100	100	100	100	100	100
90	90	90	90	90	90	90
80	80	80	80	80	80	80
70	70	70	70	70	70	70
60	60	60	60	60	60	60
50	50	50	50	50	50	50
40	40	40	40	40	40	40
30	30	30	30	30	30	30
20	20	20	20	20	20	20
10	10	10	10	10	10	10
0	0	0	0	0	0	0
53.3%	0%	46.7%	72%	8%	12%	8%

Reader: PT First Language: (oral) Spanish; (written) Spanish

Text: Medium-Level

Time Spent in reading: 7'30"

Total Number of Miscues: 28

Miscues Per One Hundred Words: 2.5

Comprehension

SOUND/GRAPHIC RELATIONSHIPS					
Graphic			Sound		
High	Some	None	High	Some	None
100	100	100	100	100	100
90	90	90	90	90	90
80	80	80	80	80	80
70	70	70	70	70	70
60	60	60	60	60	60
50	50	50	50	50	50
40	40	40	40	40	40
30	30	30	30	30	30
20	20	20	20	20	20
10	10	10	10	10	10
0	0	0	0	0	0
52.9%	17.6%	29.4%	0%	52.9%	47.1%

GRAMMATICAL RELATIONSHIPS						
Function			Relationships			
Identical	Indeterminate	different	Strength	Partial Strength	Weakness	Overcorrection
100	100	100	100	100	100	100
90	90	90	90	90	90	90
80	80	80	80	80	80	80
70	70	70	70	70	70	70
60	60	60	60	60	60	60
50	50	50	50	50	50	50
40	40	40	40	40	40	40
30	30	30	30	30	30	30
20	20	20	20	20	20	20
10	10	10	10	10	10	10
0	0	0	0	0	0	0
64.3%	7%	28.6%	56%	12%	20%	12%

Reader: EO First Language: (oral) Spanish; (written) Spanish

Text: Medium-Level

Time Spent in Reading: 6'50"

Total Number of Miscues: 27

Miscues Per One Hundred Words: 2.35

Percentage Line

Frequency Line

Reading Comprehension Scores: 28.5

SOUND/GRAPHIC RELATIONSHIPS					
Graphic			Sound		
High	Some	None	High	Some	None
100	100	100	100	100	100
90	90	90	90	90	90
80	80	80	80	80	80
70	70	70	70	70	70
60	60	60	60	60	60
50	50	50	50	50	50
40	40	40	40	40	40
30	30	30	30	30	30
20	20	20	20	20	20
10	10	10	10	10	10
0	0	0	0	0	0
33.3%	38.8%	27.7%	22.2%	38.8%	38.8%

GRAMMATICAL RELATIONSHIPS						
Function			Relationships			
Identical	Indeterminate	different	Strength	Partial Strength	Weakness	Overcorrection
100	100	100	100	100	100	100
90	90	90	90	90	90	90
80	80	80	80	80	80	80
70	70	70	70	70	70	70
60	60	60	60	60	60	60
50	50	50	50	50	50	50
40	40	40	40	40	40	40
30	30	30	30	30	30	30
20	20	20	20	20	20	20
10	10	10	10	10	10	10
0	0	0	0	0	0	0
57.1%	0%	42.8%	60%	20%	12%	8%

Reader: CY First Language: (oral) Chinese; (written) English

Text: Medium-Level

Time Spent in Reading: 7'48"

Total Number of Miscues: 34

Miscues Per One Hundred Words: 3.08

Comprehension

SOUND/GRAPHIC RELATIONSHIPS					
Graphic			Sound		
High	Some	None	High	Some	None
100	100	100	100	100	100
90	90	90	90	90	90
80	80	80	80	80	80
70	70	70	70	70	70
60	60	60	60	60	60
50	50	50	50	50	50
40	40	40	40	40	40
30	30	30	30	30	30
20	20	20	20	20	20
10	10	10	10	10	10
0	0	0	0	0	0
54.5%	27.3%	18.2%	31.8%	27.3%	40.9%

GRAMMATICAL RELATIONSHIPS						
Function			Relationships			
Identical	Indeterminate	different	Strength	Partial Strength	Weakness	Overcorrection
100	100	100	100	100	100	100
90	90	90	90	90	90	90
80	80	80	80	80	80	80
70	70	70	70	70	70	70
60	60	60	60	60	60	60
50	50	50	50	50	50	50
40	40	40	40	40	40	40
30	30	30	30	30	30	30
20	20	20	20	20	20	20
10	10	10	10	10	10	10
0	0	0	0	0	0	0
88.2%	0%	11.8%	36%	56%	4%	4%

Reader: FH

First Language: (oral) Chinese; (written) English

Text: Medium-Level

Time Spent in Reading: 7'5"

Total Number of Miscues: 27

Miscues Per One Hundred Words: 2.39

Comprehension

SOUND/GRAPHIC RELATIONSHIPS					
Graphic			Sound		
High	Some	None	High	Some	None
100	100	100	100	100	100
90	90	90	90	90	90
80	80	80	80	80	80
70	70	70	70	70	70
60	60	60	60	60	60
50	50	50	50	50	50
40	40	40	40	40	40
30	30	30	30	30	30
20	20	20	20	20	20
10	10	10	10	10	10
0	0	0	0	0	0
35.7%	21.4%	42.9%	21.4%	14.3%	64.2%

GRAMMATICAL RELATIONSHIPS						
Function			Relationships			
Identical	Indeterminate	different	Strength	Partial Strength	Weakness	Overcorrection
100	100	100	100	100	100	100
90	90	90	90	90	90	90
80	80	80	80	80	80	80
70	70	70	70	70	70	70
60	60	60	60	60	60	60
50	50	50	50	50	50	50
40	40	40	40	40	40	40
30	30	30	30	30	30	30
20	20	20	20	20	20	20
10	10	10	10	10	10	10
0	0	0	0	0	0	0
57.1%	7.1%	35.7%	48%	16%	20%	16%

Reader: CC First Language: (oral) Chinese; (written) English

Text: Medium-Level

Time Spent in reading: 6'20"

Total Number of Miscues: 30

Miscues Per One Hundred Words: 2.66

Comprehension

SOUND/GRAPHIC RELATIONSHIPS					
Graphic			Sound		
High	Some	None	High	Some	None
100	100	100	100	100	100
90	90	90	90	90	90
80	80	80	80	80	80
70	70	70	70	70	70
60	60	60	60	60	60
50	50	50	50	50	50
40	40	40	40	40	40
30	30	30	30	30	30
20	20	20	20	20	20
10	10	10	10	10	10
0	0	0	0	0	0
42%	26.3%	31.6%	31.6%	26.3%	42%

GRAMMATICAL RELATIONSHIPS						
Function			Relationships			
Identical	Indeterminate	different	Strength	Partial Strength	Weakness	Overcorrection
100	100	100	100	100	100	100
90	90	90	90	90	90	90
80	80	80	80	80	80	80
70	70	70	70	70	70	70
60	60	60	60	60	60	60
50	50	50	50	50	50	50
40	40	40	40	40	40	40
30	30	30	30	30	30	30
20	20	20	20	20	20	20
10	10	10	10	10	10	10
0	0	0	0	0	0	0
60%	0%	40%	68%	20%	8%	4%

APPENDIX C

Questionnaire for the Study of Script Effects and Reading Strategies:

Name: Birth date: Birth place:

Your first language: (oral) (written)

How many years of education in your first language ?

Do you read in your native language **fast** / **moderately** / **slowly** compared with your classmates and friends?

How many years of Education in English ?

Have you ever taken any standard tests in English (TOEFL, PSU placement test, etc.) ? **yes.** **no.**

If **yes**, **what** is the last test and **when** ?

Total scores: Listening: Reading: writing: Grammar:

Which hand do you use when you write ? **Left.** **Right.** **Both.**

If **both**, **how often** do you use each of them ?

Right: 95% 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10%

Left: 95% 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10%

Note: (1) This questionnaire is used for educational purpose. Your name with the information is confidential. The information will be used anonymously in the research report. (2) For most questions, just circle answers provided. For some, please write a short answer.

APPENDIX D

Fry's readability graph is adopted from Reading Expectancy and Readability (Pescosolido and Gervase, 1971).

Fry's Readability Graph Extended thru Preprimer Level

APPENDIX E

The medium-level reading text and the reading comprehension questions

Despite its charm and interest, the AUTOBIOGRAPHY does not present a completely satisfactory version of Franklin. It is incomplete, since it carries Franklin only to the age of fifty-one, when he stood really but on the threshold of greatness. It tends to oversimplify him by failing to do justice to his amazing versatility, his restless energy of mind, his tremendous sweep of accomplishments. Franklin was a person of diffuse talents; he involved himself so thoroughly with his world that it is difficult to draw together in focus all the facets of his mind and character. For a man who was, as Herman Melville said, "everything but a poet," one uncompleted document is certainly not enough to explain him. We see in its pages little of the scientific interests which absorbed him before 1757, only a few hints of his social and family life, almost nothing of his political career, of course nothing of the years of middle and later life.

The most serious deficiency of the AUTOBIOGRAPHY is the image of Franklin as "Poor Richard" that it is likely to project. By oversimplifying a personality of depth and complexity into a shrewd tradesman of homely apothegms and a full pocketbook, the narrative has sometimes left its readers with the false likeness of Franklin which led John Keats to call him (with regrettable misundersanding) "a philosophical Quaker full of mean and thrifty maxims." Franklin did believe, as he said, that portions of his narrative might serve to exemplify to the young "the effects of prudent and imprudent conduct in the commencement of a life of business," but he did not mean to be judged by posterity solely in terms of his rags-to-riches success story or of THE WAY TO WEALTH. Unfortunately, Parson Weems, Noah Webster's schoolbooks, McGuffey's readers and a thousand inspirational orators and copywriters have fixed Franklin in the popular mind as the first apostle of frugality and the patron saint of savings accounts.

There is some truth, to be sure, in this picture of Benjamin Franklin. By reason of his industry, skills, and acumen he rose from penniless obscurity to fame and wealth. He was a hardworking, shrewd, successful businessman, and he did, in his guise of Poor Richard, embody a good many of those practical virtues with which the way to wealth is paved. "A Penny saved is a Tuppence clear," "God helps those who help themselves," "Keep

thy Shop well and thy Shop will keep thee," "A word to the wise is enough," "Lost time is never found again," and dozens of other Franklinian maxims are imbedded deep in the American business tradition as the distilled wisdom of a man who made good. The AUTOBIOGRAPHY is a success story of no small proportions. Franklin knew how to size people up and how to get along with them; he perceived the advantages of influential friendships. He hated inefficiency and ineptness; he had a keen sense of administration and he was a genius at organization. He worked hard, kept accurate accounts, invested wisely, produce careful work of high quality, honored his contracts, dressed neatly, avoided hurtful temptations, and retired after twenty years of business with a comfortable fortune and a secure future.

Yet this view of Franklin shows but a small fragment of the character of a man who freely admitted to various "errata," who found thrifty "a virtue I could never acquire," who confessed to disorderly and careless habits, who depended on his wife to keep the books straight and curb his openhanded generosity, and who jeopardised his life and fortune by joining a risky revolution at seventy. "An egg today is better than a hen tomorrow" does not sound like Poor Richard, but it is, and so is "There's more old drunkards than old doctors," "Let thy maid-servant be faithful, strong, and homely," and "Keep your eyes wide open before marriage and half-shut afterwards." Moralizers have often abstracted from Franklin's AUTOBIOGRAPHY and his letters a laudable set of rules of conduct for the virtuous and thrifty, just as Franklin himself drew up his ledgers of moral bookkeeping. But his self-acknowledged "foolish intrigues with low women," his passionate bouts of indulgence, his willingness (as he admitted) "to change opinions which I had thought right but found otherwise," confuse the moralists and blur the portrait of the rather stuffy young man who appears in early portions of the AUTOBIOGRAPHY. Franklin could never take "the great Dr. Franklin" quite so seriously as some of his admirers have done; he does not always tell the whole story, and he is often amused at himself when he does. It is interesting to note that contemporary gossip had it that Franklin was not asked to draft the Declaration of Independence for fear he might hide a joke in it--just as at its signing, one of the most solemn moments in modern history, he reputedly dropped his quip about hanging together or separately. The truth is that Franklin was not a simple, uncomplicated man, nor is he to be explained only in terms of the tradesman's dream of success.

Franklin's business career, successful as it was, was but a brief interlude in a long, full life. He was perfectly willing to gather unto himself a competent share of the world's goods, and he knew how to do it with the cleverest of them. The game of business, however, with its "little cares and fatigues," neither excited nor interested him. He wanted money

because it gave him independence and security to live as he wished, in pursuit of those things he found important in life. He wanted, he said, "leisure to read, study, make experiments, and converse at large with such ingenious and worthy men as are pleased to honor me with their friendship or acquaintance, on such points as may produce something for the common benefit of mankind." There is no doubt but that had he so desired, Franklin might have been very rich indeed. Had he patented only a few of his commercially adaptable inventions (such as his stove, bifocal spectacles, or lightning rods) he could have been on of the world's wealthiest men. Instead he decided at forty-two that he had money enough, retired, and lived comfortably for more than a half-century longer on the relatively modest income from his holdings. He was more interested in knowledge than in money. He did not wish to have it said of him, as Poor Richard said of another, " He does not possess wealth, wealth possesses him." (selected from AUTOBIOGRAPHY AND OTHER WRITINGS, Nye (Ed). p.ix-xi, 1958)

Reading Comprehension Questions for the Medium-Level Text

Chose the best answer for each of the following questions according to the passage you have read:

1. The author thinks that the AUTOBIOGRAPHY is not satisfactory because Franklin

- A. was only fifty-one when he wrote it.
- B. could not concentrate his mind.
- C. oversimplified himself.**
- D. wrote much about his political career.

2. According to the author, the AUTOBIOGRAPHY presented the image of Franklin as

- A. " Poor Richard ".**
- B. a man of depth and complexity.
- C. Noah Webster.
- D. a philosophical Quaker.

3. Which of the following never belong to Franklin in his AUTOBIOGRAPHY according to the passage?

- A. penniless obscurity.
- B. hard working.

- C. keen sense of administration. **D. non-practical virtues.**
4. The author believes that Franklin recognizes in general
- A. only his good character. **B. his good character and shortcomings.**
- C. only his "errata". D. some of his character.
5. According to the gossip in the passage, Franklin had
- A. little sense of humor B. not enough sense of humor
- C. some sense of humor **D. too much sense of humor.**
6. The author thinks that business did not interest Franklin because
- A. he wanted to talk with people and do experiments.**
- B. he never wanted money in his life.
- C. he wanted independence and security.
- D. he never had any interest in it since his childhood.
7. The author of the passage tries to present
- A. an uncritical view of Franklin.
- B. a complete view of Franklin.**
- C. a view of Franklin that Franklin himself did not like.
- D. a simple view of Franklin.

Low-level reading text and reading comprehension questions

Two Styles of Homes in the United States

The authority-centered home: In this home there is some "authority" which serves as a standard by which most or many important matters are judged. The authority may be a person, father or grandfather, or it may be a religion or a religious book, such as the Bible. It may be education or some symbol of that, such as a weighty set of the great books. It might be the family business or the family name. But there is a sense of a fixed authority, a core, around which communication is centered. (Note that this need not be an authoritarian home.) While this home is described as one type of American home, arising from Goodwin's observations, it shares much in common with many European homes. Comparisons with a German home will be described later.

In this home there is very often a clear distinction between family areas of the home and guest areas: typically there is a livingroom or parlor where guests are received and entertained, and this room is ordinarily not used by family members. In this room are displayed the treasures of the home: antiques, heirlooms, a portrait, perhaps, and the most sacred and salient symbols of the family.

Ideally in this home the family dines together. Children are expected to be present for dinner, and it is at dinner that the children are socialized into the family and its values. Conversation proceeds typically in a question and answer form, the parents asking the questions, the children supplying the answers: "What did you learn at school today? You came home at 4:30, but school is out at 3:15; where did you go after school! Have you started on your homework yet? Did you do the chores?" The children give the answers. Goodwin notes that among his patients who come from such a background there is often tension associated with eating.

There are to be no secrets in this family; anything and everything of importance is to be discussed within the home. Mother or father feel free to check on the childrens' reading materials, and open and read letters received by the children, and to approve or censor what is found. That which takes place outside of the home, away from the eyes and ears of the parents, is suspected. The house has doors and the doors have locks, but one must not go into a room and lock the door: "What are you doing in there? Why did you close the door? You don't have to close the door: if we're making too much noise for you to study we will be quiet. Open the door."

For these reasons, the bathroom becomes an important room for intrapersonal communication--for being alone and "thinking" or even talking out loud. The bathroom (and toilet) is the only place where one can be alone

without arousing suspicion, and the bathroom provides the added advantage of a mirror for "mirror talk" while shaving or putting on make-up.

The kitchen is often a setting for "negotiation" between children and their mother, particularly when it is necessary to talk father into something. As many questions and problems and requests by children are likely to be answered by, "ask your father" or "ask your mother," and as mother is more accessible physically and psychologically than father, mother's area in the kitchen is extremely important. (It is interesting that in a study of word values conducted independently, the word "kitchen" was found to rank among the most highly valued words by Americans.)

The parents' bedroom is a setting for little intimate communication. Largely off-limits to the children and often symbolically divided between mother's and father's areas (separate closets or wardrobes, often with mother's "little shrine of perfumes," as Roloff describes it, and father's tie rack, comb and brush set) even the sides of the bed (or twin beds) also limit communication between the parents. (In the bathroom, "His" and "Hers" towels may reflect the division.)

Outside of the home, the best place for the children to be--from the parents' point of view--is school. There the parents assume that control is maintained, and, moreover, competitive values are sharpened. Competition is regarded as essential to the development of character and appears to influence even patterns of speech (such as a reference for ranking evaluations, as we will mention in Chapter ten.)

There is more to be said about this kind of home, but this may be sufficient to contrast this authority-centered home with another style, the social-centered home.

The social-centered home. The social centered home is imbued with an air of social activity, and the entire home is prepared for sociality. In contrast to the authority-centered home, where the parents have clear authority over their children, in the social-centered home the parents often act as assistants to their children's social interests: "Would you like to have a party this week? I will help you plan some games, and Dad can bring the other children here in the car if you like."

There is a great informality about the home, so that there are no clearly marked divisions between "family" and "company" areas. A guest is as likely to be invited to the kitchen as to the livingroom. Movement within the house is free and casual, so that almost no room is likely to be more of a center for communication than any other. In sharp contrast to the authority-centered home, the family is not likely to take meals together. The very social activities may prevent everybody from being home at the same time. The kitchen sometimes resembles a central information exchange, with messages substituting for conversation: "Johnny--sorry,

but I have to go to a meeting-- there are leftovers in the refrigerator, fix yourself something for supper. Dad has bowling tonight. Mom." " Mom: Peter came home with me we made sandwiches. We have play rehearsal tonight. See you about 9:30. Johnny. P.S. Betty called and said she will be home late."

Along with such activities as scouts, community projects, sports, and music lessons, party-going and dating is urged upon the children at an early age. And one of the significant results of all this socializing is that serious conversations are more likely to take place away from home than within the home. Thus Goodwin notes, when persons from such home backgrounds marry, they often find it difficult to talk to each other at home ! They are so accustomed to going out to parties, dances, and dinners where they are with other people, that the two alone in a home are not prepared for significant conversations. And so they may continue the pattern of socialization very soon after marriage, inviting friends over and going out to parties. A wife may receive some important information second hand, overhearing her husband saying something to a friend before she herself is told: Mat, I heard you telling Mrs. Bensen that you thought we might go to Mexico this summer. You didn't tell me that before. " " Didn't I ? Oh, I guess I didn't--well, what do you think of the idea ? "

Reading Comprehension Questions for the Lower-Level Text

Chose the BEST answer for each of the following questions according to the passage you have just read:

1. According to the passage, which of the following is NOT the "authority" in the authority-centered home ?

A. Family business.	B. A book.
C. Goodwin.	D. A symbol.

2. In the authority-centered home, children are socialized into the family and its values

A. in the bathroom.	B. in the diningroom.
B. in the parlor.	C. in the yard.

3. The house of an authority-centered home has doors and locks

A. because they wanted to keep their secrets.

B. because they want to keep noise away.

C. because they do not trust each other.

D. for none of the above reasons.

4. According to the passage, the most valued word is

A. kitchen.

B. bathroom.

C. mother.

D. school.

5. In a social-centered home, a guest is likely to be invited to

A. the livingroom.

B. the kitchen.

C. the diningroom.

D. any of them.

6. Children in a social-centered home become socialized mainly

A. in none of the following places.

B. in the kitchen.

C. in the parlor.

D. at home.

7. Which of the following will parents of a social-centered home probably NOT do ?

A. ask their children not to keep their secrets among family members.

B. ask their children to have dates with girls and boys early.

C. ask their children to hold a party in their own house.

D. ask their children to cook their own meals.