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THE IMPACT OF TEXT CONDITIONS ON ORAL READING BEHAVIORS AND READING COMPREHENSION OF AMERICAN COLLEGE CHINESE AS A FOREIGN LANGUAGE LEARNERS

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THE IMPACT OF TEXT CONDITIONS ON ORAL READING BEHAVIORS AND READING COMPREHENSION OF AMERICAN COLLEGE CHINESE AS A FOREIGN LANGUAGE LEARNERS

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF INSTRUCTIONAL LEADERSHIP AND ACADEMIC CURRICULUM

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To my mother for her ongoing love and support, and to my father who could not see this dissertation completed.

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ABSTRACT

This study aimed to explore American college intermediate-level Chinese as a foreign language (CFL) learners' oral reading behaviors and comprehension under different text conditions. It investigated how college CFL learners approached different orthographic texts in CFL reading. Twenty-one college intermediate-level CFL learners were asked to orally read three different versions of a Chinese text: a text consisting of (a) Chinese characters, (b) pinyin, and (c) Chinese characters with pinyin. Three texts were used in this study. To obtain data, the researcher took running records of the participants' oral reading and asked them to answer several comprehension questions related to each text. The study's findings indicated the interactive nature of CFL reading. It also revealed the impacts of text factors and reader factors and how they interacted to influence CFL oral reading and comprehension. The CFL oral reading protocol developed in this study can be used as a valuable tool for assessing and analyzing CFL readers' oral reading errors and can also help determine the difficulty level of Chinese texts in CFL teaching. The findings from this study offer new insights into the reading processes and strategies employed by CFL readers under different text conditions. The study has important implications for research and teaching of Chinese as a foreign language.

CHAPTER 1: INTRODUCTION

Introduction of the Study

Foreign language teaching and learning practices have their roots in both first language and second language teaching and learning. Many researchers have acknowledged the use of the theories of first language (L1) reading as a basis for further research in second language (L2) and foreign language (FL) reading (Klein, 1986; Koda, 2005).

Even though L2 and FL reading are different due to differences in the availability of and exposure to the target language in the language learner's environment, the two share many similarities (Barnett, 1989). Foreign language learning theories have roots in and are heavily influenced by second language acquisition theories, and the two terms are often used interchangeably in literature related to foreign language acquisition. In this study, I followed the same practice and also use the two terms interchangeably.

However, compared to the number of studies focusing on learners studying English as a foreign language, there is much less research on oral reading behaviors and comprehension processes involved in learning foreign languages. There have been even fewer studies on teaching Chinese as a foreign language (CFL) because CFL is a rather new field of study. Among them, most studies have focused on character recognition and strategies used by CFL students to learn Chinese characters (Ke, 2012).

Helping CFL learners to effectively decode and automatically recognize Chinese characters is an ongoing and ever present challenge in CFL teaching and learning (Walker, 1984). The Chinese writing system uses characters instead of alphabetic

letters. It is a challenging job for English-speaking Chinese language learners to learn to read in Chinese.

There are about 2,500 commonly used Chinese characters, and these include more than 90% of the characters used in daily reading. CFL reading is a complex process that involves more than just knowing Chinese characters. It involves awareness of the basic units of spoken language, the basic units of the writing system, and relation between script and speech. For CFL learners in America, it is a challenge for them to transfer their L1 reading strategies to L2 Chinese reading (Ke, 2012). Chinese is rated as one of the hardest languages for native English speakers to learn, with an estimated two-thirds of college students in most American universities withdrawing from Chinese courses after their second year of study due to the difficulties they encountered in reading and writing (Wang, 2006). Therefore, CFL reading demands immediate research so that more CFL students can become successful learners of Chinese and develop Chinese language proficiency.

Chinese is listed as one of the critical languages by the American government (NSEP, 2010). Coming hand in hand with China's incredibly fast development in recent years, the Chinese language has become one of the most popular foreign languages to learn for many college students in America. Currently, with the increasing population of CFL learners among native English speakers and limited research in this area, more research on CFL reading, especially in the areas of understanding reading behaviors and how the different text conditions affect comprehension in CFL learning for English native speakers, is a pressing task in CFL language education. CFL pedagogy calls for

sound knowledge of Chinese reading as a basis for teaching Chinese effectively and promoting CFL teaching in America.

Basic Understanding of Chinese Language

One of the major difficulties in Chinese reading is related to accurate decoding and automatic character recognition, because the standard Chinese writing system consists of Chinese characters. The Chinese orthography uses logographic characters and is not an alphabetic system. Unlike alphabetic languages, Chinese words consist of characters or morphemes. Individual characters can have multiple meanings. Each new meaning of a character can only be learned in new linguistic situations. Chinese characters as morphemes are independent of phonetic change. The combination of the components in any one character is not arbitrary. Although most of the Chinese characters have semantic radicals and phonetic components, the phonetic components are large in number and not reliable due to historical change. Therefore, it is difficult for non-advanced level CFL readers to use the phonetic component for character decoding. CFL learners usually have to memorize a character as a whole. It is difficult for CFL readers to connect to spoken language from the Chinese writing system. In addition, the text script written in Chinese characters has no space between words, so finding word boundaries by isolating the characters is another challenging task for CFL readers.

Furthermore, Hanyu pinyin, often known as pinyin, is an alternative Chinese writing system. The pinyin system was developed in the 1950s. It was published by the Committee for the Reform of the Chinese Written Language under China's Ministry of Education in 1958 in the People's Republic of China and has been revised several times. The International Organization for Standardization (ISO) adopted pinyin as an

international standard for Chinese phonology and alternative Chinese writing system in 1982. Based on the Romanized New Script initiated in the late 1920s, the pinyin system uses 25 letters of the English alphabet. The letter 'v' is deleted, while the 'ü' (yu) letter with tone marks was revised to represent the sound of Mandarin Chinese. Pinyin was not developed to substitute for Chinese characters, but to (1) indicate the pronunciation of characters, (2) spread the use of *Putonghua* (Mandarin Chinese), (3) help Chinese minorities to create or reform their scripts, and (4) help foreigners to study Chinese (Wang, 2006; Zhou, 1980). Pinyin is almost universally employed now for teaching standard spoken Chinese in schools and universities. Pinyin as an alternative Chinese writing system indicates the pronunciation of characters and defines word boundaries by adding space between words. It helps CFL learners connect to spoken language from the writing system and is also widely used in CFL college-level learning and teaching in America.

Purpose of the Study

Many studies have been conducted on the teaching and learning of character recognition. However, to my knowledge, no study has been conducted that explores CFL learners' oral reading processes and strategies employed by CFL learners when they read different Chinese scripts. Also, limited literature can be found on reading comprehension of CFL learners, even though it is well understood that comprehension is the goal of reading. This research explored American college CFL learners' oral reading behaviors and comprehension under different text conditions. It investigated how college CFL learners approached different orthographic texts in CFL reading. College intermediate-level CFL learners were asked to orally read three different

versions of a Chinese text: a text consisting of (a) Chinese characters, (b) pinyin, and (c) Chinese characters with pinyin.

Theoretical Framework

This study adopts the psycholinguistic theory of reading and interactive models of reading as its major theoretical lenses. In particular, it employs the reading theories of Goodman's psycholinguistic theory (Goodman, 1967), Rumelhart's Interactive Model (1977, 1994), and Stanovich's Interactive-Compensatory Model of reading (1980, 1984, 2000). The linguistic analysis employed in this study was also informed by Clay's work, especially her work on recording and analyzing running records (Clay, 2000). The theories are briefly reviewed in this chapter and will be discussed in greater detail in Chapter 2.

Before the interactive models were recognized in the 1980's, two different views had emerged from previous reading studies. The Cognitive-Processing Model (Gough, 1972) and Information-Processing Model (LaBerge & Samuels, 1974) regard the reading process as a series of discrete stages that only allow information to flow from lower-level to higher-level processes (also known as "bottom-up models"). In these traditional models of reading, first letters are identified, next, sounds are attached to them, then word meaning is added, and finally, all the words are processed and the meaning of the sentence is understood.

An alternative to the traditional reading models is the psycholinguistic theory by Goodman (1967). The theory advocates that reading is not a passive, but rather an active process, involving the reader in ongoing interaction with the text. The model also emphasizes the importance of a reader's background knowledge during the reading

process and highlights both the psycholinguistic model aspect of reading and sociolinguistic aspects of reading. According to this model, readers use all of the available sources of information, including their language and background knowledge to make predictions and hypotheses about upcoming text. The psycholinguistic theory proposed by Goodman (1967) and Smith (1971) represents the theoretical "top-down" model of reading. It regards "reading as a psycholinguistic guessing game" (pp.46).

Rumelhart (1977, 1994) first proposed a nonlinear model of the reading process in his interactive model. He realized that the previous cognitive-processing and information-processing reading theories were linear and had serious flaws, because the models only regard information as flowing from lower-level to higher-level processes. They did not take into account that higher-level thinking may also influence lower-level processing. Rumelhart (1977, 1994) argued that the simultaneous processing of syntactic information (referring to word order within sentences), semantic information (related to message construction), orthographic information (related to visual input), and lexical information (referring to word knowledge) allows for higher-level and lower-level processes to simultaneously interact during the act of reading.

Stanovich (1980) reviewed interactive models of reading proposed by Rumelhart (1977) and extended his model to include the ideas that not only are text processors (e.g., word recognition, context information) interactive and nonlinear, but that they are also compensatory. This means that if one processor is not working properly, or has insufficient data, the other processors compensate for it. Stanovich (2000) used the role of context in word recognition to explain his Interactive-Compensatory Model. He argued that skilled readers were more sensitive to contextual

variables and had superior ability to recognize words in isolation. The good readers actually do not need to rely on context so often and are actually less likely to use context to facilitate word recognition. In contrast, less-skilled readers are weak in word recognition and they rely on context to compensate for their weak word recognition abilities. Unlike the "top-down" models of psycholinguistic theory about "reading as a psycholinguistic guessing game"(pp. 46-58), Stanovich (2000) regards the reading process as a text-driven automatic decoding process.

Although Rumelhart's (1994) and Stanovich's Interactive Models (1980, 1984, 2000) have some differences, from the perspective of interactive models of reading, they both hold that reading is not a simple or linear process, but factors at all levels interact when readers approach the text.

There are several reasons why the psycholinguistic theory and interactive models apply to CFL reading research. Psycholinguistic theory considers that there is an essential interaction between language and thought in reading. It situates reading within the broader context of the communicative and meaning-seeking nature of reading. It has led to extensive research in foreign language on how various language systems affect the reading process (Carrell, 1983a, b; 1984). There is a strong relation between knowing the pronunciation of a character and understanding its meaning (Everson, 1998; Ke, 2012). Due to the unique nature of the Chinese writing system, for many CFL learners, if they truly know how to pronounce a character, it is very likely that they know its meaning. However, recognizing a character does not mean that they know its sound. Oral miscue analysis helps shed light on readers' reading processes and behaviors through analyzing readers' oral reading of a text.

The interactive models regard reading as an interactive instead of a linear decoding process. The very nature of interactive models suggests that higher-level processes play a significant role, but are not the whole of the interactive process. Most foreign language students coming from different orthographic traditions appear to be affected by differing orthographic conventions. Since conventional Chinese writing uses characters instead of alphabetic letters, the Chinese language-specific writing system leads to a different script-speech relation. This partly explains why it is challenging and difficult to study Chinese reading by just adopting the models for L1 reading or reading of other languages (Everson 1998; Ke, 1996, 2012; Koda, 2005; Shen & Ke, 2007; Shu & Anderson, 1997; Taylor & Taylor, 1983; Tzeng & Hung, 1981). The interactive models allow for higher-level and lower-level processes to simultaneously interact during a reading act (Rumelhart 1977, 1994). It can explain how the lower-level processing abilities, such as Chinese character recognition, interact simultaneously with the higher-level knowledge, such as syntactic information, semantic information, and background knowledge, etc. to affect the reading of Chinese texts.

Interactive models also hold that the many lower-level processing skills are critical for good reading. They suggest that methods of instruction for rapid visual recognition, for extensive vocabulary development, and for syntactic pattern recognition should become major pedagogical concerns (Grabe, 1984, 1986; Mckeown, Beck, Omanson, & Pople, 1985; Nagy, Herman, & Anderson, 1985). This view is applicable to the reality of Chinese language learning and consistent with CFL pedagogy. Based on the instructional practices of CFL reading and CFL research, students continually indicate that one of the lowest level skills, recognizing characters, presents an ongoing

and persistent challenge in CFL reading, and is absolutely crucial to achieving and maintaining Chinese language skills and knowledge. There have been a number of studies in the CFL literature that note Chinese character recognition and other linguistic deficiencies as inhibiting factors in CFL reading (Ke, 2012; Walker, 1984; Wen, 2012).

This study employed running records (Clay, 2005) for data collection and oral reading error analysis to examine the behaviors and processes involved in the reading of Chinese texts for a group of college intermediate-level CFL learners. Running records provide an assessment of oral reading of authentic texts. The analysis of oral reading errors in different text conditions (character only, pinyin only and character with pinyin) allowed me to find out what the participants already knew, which language cueing systems they attended to, and what they overlooked in reading Chinese. It also allowed me to identify patterns of oral reading of CFL learners and how different text conditions impacted their oral reading and reading comprehension.

Rationale for and Importance of the Study

This study is unique for several reasons. First, little research has been done on reading behaviors and processes in CFL reading. For CFL reading research, most recent studies have focused on word recognition and strategies used by CFL students to learn characters (Ke, 2012). Adopting psycholinguistic theory and interactive models of reading as its theoretical framework, this study views Chinese reading as a complex endeavor that integrates higher-level processes (e.g., structure (syntax), meaning (semantics), and readers' Chinese cultural knowledge) and the lower-level skills (e.g., character recognition, orthographic processing, and phonological processing.) This

study seeks to identify patterns of oral reading processes demonstrated by intermediate-level college CFL learners.

Second, this study involves miscue analysis and uses running records to record participants' oral reading errors. It provides an effective assessment of text reading (Clay, 2000). Taking running records and conducting analysis of the errors provided ways to understand what happened when the participants read the Chinese texts. In other words, analyzing oral reading errors provided insights into the reading processes and strategies employed by the participants.

Third, this research uses three reading texts at a similar difficulty level. Each text was presented in three conditions: Chinese character only, pinyin only, and character with pinyin. The participants' different levels of performance when they read the three different versions of the texts provided further information on the impact of Chinese orthographies (character and pinyin) on Chinese reading.

Finally, current CFL education mostly focuses on CFL students' spoken language development as the starting point of Chinese reading. Yet, there is very limited research on the question of whether having a good knowledge of Chinese language helps CFL learners with character recognition and reading comprehension. The findings have strong implications for CFL research and teaching for CFL learners.

Research Questions

This study sought to answer the following research questions:

Research question 1: What are the major patterns of oral reading behaviors of American college CFL learners when they read texts in three different conditions: Chinese character only, pinyin only, and Chinese character with pinyin?

Research question 2: How do different text conditions impact CFL learners' reading comprehension?

Limitations of the Study

Like most studies, this study has its limitations. First, the study has a small sample size. The small sample size can potentially threaten the external reliability of the research. Second, even though the participants all come from the intermediate-level class, they could have had different language learning experience and their Chinese proficiency levels could vary. Caution has to be used when interpreting the findings.

In addition, the difficulty level of the three texts may vary due to their respective topics. Some participants may have more prior knowledge on certain topics than others.

Despite these limitations, this study extends current research that tends to focus on character recognition and Chinese character learning strategies to include investigations on the reading behaviors and comprehension. The study's findings expand our current knowledge of CFL reading.

Organization of the Dissertation

This dissertation is organized into five chapters. Chapter 1 presents an introduction to the study, its purpose, theoretical framework, the study's questions, limitations, and arguments for its research and educational importance. There are two research questions in this study, which explore Chinese oral reading behaviors in different text conditions and the connection between comprehension and text conditions.

Chapter 2 reviews the literature relevant to this study. It addresses reading theories and foreign language learning theories vital to the research and the

interpretation of the results. In particular, I discuss in great depth psycholinguistic theory, interactive models of reading, foreign language learning theories, and CFL reading studies. Other topics reviewed include the use of running records for the analysis of oral reading and characteristics of Chinese orthography and text script.

Chapter 3, comprised of four major sections, presents the research methodology. The first section describes the research setting and participants. The second section describes the research design. The third section describes data collection procedures. The fourth section describes the various methods of data analysis employed in the study. These include linguistic analysis, quantitative descriptive statistics, and qualitative content analysis.

Chapter 4 reports the findings from the linguistic, quantitative, and qualitative analysis of the data. Important findings are further discussed in chapter 5.

Chapter 5 discusses the study's results. It draws conclusions and implications for CFL teaching. Suggestions for future CFL reading research are also made.

CHAPTER 2: LITERATURE REVIEW

Overview

Chapter 2 offers a brief review of the theoretical frameworks that guide this study. Reading theories and models of reading, including psycholinguistic theories, the Interactive Model of reading, and the Interactive-Compensatory Model of reading are discussed as well as other theories related to second language and foreign language reading (including Chinese as a foreign language). Also presented are prior studies informed by the related theories and models. Furthermore, the chapter describes unique characteristics of Chinese orthography and reports research that has been conducted to investigate multiple aspects of CFL reading. This chapter concludes with the rationale for the study and the research questions this study seeks to answer.

Theoretical Frameworks

Psycholinguistic Theory of Reading and Related Research

Psycholinguistic theory of reading. The psycholinguistic theory of reading has influenced how reading educators and researchers view first language reading since the 1970's (Goodman 1967, 1971; Smith, 1971). This theory has also greatly contributed to our understanding of second language reading (Carrell, Devine, & Eskey, 1988).

An important concept of the psycholinguistic theory of reading is that reading is not simply passive, but rather an active process. According to this theory, reading is an active, communicative, and meaning-seeking process.

Goodman (1975) first highlighted the psycholinguistic aspects of reading: Reading is a receptive language process. There is thus an essential interaction between language and thought in reading. The writer encodes thought as language, and the

reader decodes language to represent thought. Readers use their knowledge of grapho-phonics, syntax, and semantics to reduce their dependence on the print and sounds of the text they read.

Goodman (1967) considered reading as a psycholinguistic guessing game and specified four processes in reading: predicting, sampling, confirming, and correcting. First, readers make predictions about the grammatical structure in a text, using their knowledge of the language and supplying semantic concepts to get meaning from the structure. Then, they sample the print to confirm their predictions. The more highly developed the readers' sense of syntax and meanings, the more selective the readers can be in sampling. After sampling, they confirm their guesses, or correct themselves if what they see does not make sense or if the graphic input predicted is not there.

Goodman (1967) also emphasized sociolinguistic aspects of reading, and thought that reader's background knowledge was important during the reading process. The background knowledge includes information from many sources: knowledge about the topic, knowledge of text structure, knowledge of sentence structure, knowledge of word meaning (vocabulary), and knowledge of letter-sound correspondences.

Smith (1971), like Goodman (1967), emphasized the role of meaning and of the reader's need to make predictions when they read. He described four characteristics of reading: (1) Reading is purposeful: readers have specific reasons and goals when they read; (2) Readers select what they read; (3) Reading is based on comprehension: readers bring certain prior knowledge to a text and add to it; (4) Reading is anticipatory: the interaction of prior knowledge, the expectation of comprehending, and purpose in reading lead readers to anticipate the text content that follows. Smith thinks that first

language reading has a tremendous impact on second language reading. In his view, the text and reader characteristics work together to influence a reader's comprehension.

Furthermore, when good readers read, they are effective in constructing meaning during reading and use various sources of information to make predictions and hypotheses about the upcoming text. Psycholinguistic theories (Goodman, 1967; Smith, 1971) emphasize the important role of various language cueing systems and how they work together in reading. Both give readers a central role in understanding what they read.

Miscue analysis. Miscue analysis is a tool that Goodman (1969) developed for in-depth analysis of readers' reading behaviors and reading processes. Goodman (1981) stated that "oral miscues reflect the psycholinguistic process of constructing meaning through predicting, sampling, confirming, and correcting" (pp. ix-xiii). The term "miscue" was first introduced by Goodman (1965), and it is used to avoid the negative connotations associated with the word "error" or "mistake".

Miscue analysis compares observed with expected responses as readers read a written text orally. It provides a continuous basis of comparison between what the readers overtly do and what they are expected to do. Comparing the mismatches between expectation and observation can illuminate where the readers have deviated and what source(s) of information and process(es) may have been involved.

From the miscue analysis, Goodman and Goodman (2004) argue that there are three language cueing systems working together to help a reader understand the meaning when they read. They are semantic, syntactic, and grapho-phonic cues and the three cueing systems have different levels of importance in reading comprehension.

Semantic and syntactic cues are considered cues related to deep structure process, while graphic cues are related to surface structure process. They suggested that grapho-phonic cues would be used more often when the deep structure cues were unavailable (Goodman, Watson, & Burke, 1987). The deep structure processes focus on knowledge and meaning, while surface structure processes deal with other characteristics of text such as visual and sound properties (Smith, 2004).

Most of the miscue analysis research was conducted on L1 English readers in the 1960's and 1970's. The taxonomy of miscues was developed by Ken Goodman (Goodman, 1969). The process of miscue analysis was adapted and formalized by Yetta Goodman and Carolyn Burke (Goodman, Y & Burke, C. 1972); Goodman, Watson, & Burke, 2005). Goodman and Burke investigated the reading processes of 94 subjects with different language proficiencies using the Goodman Taxonomy of Reading Miscues. They found that low-proficiency readers' reading processes were much the same as that of high-proficiency readers, but the low-proficiency readers could not integrate graphic, syntactic, and semantic cues of the language well. Goodman and Burke concluded that the percentage of miscues semantically acceptable before correction is the best indicator of the reading proficiency of all readers. Their early research on miscue analysis has been mentioned by most researchers who study the reading process through oral reading. There have been hundreds of studies on miscue analysis studies published since.

Goodman and Goodman (1978) studied miscues in reading for eight groups of 2nd, 4th, and 6th grade pupils whose first language was not English. The results suggested the reading process was the same for all subjects, regardless of race, age, or reading

proficiency. Wang (2006) argued this study provided the possibility of understanding foreign language reading by analyzing miscues that reflect readers' use of grapho-phonic, syntactic, and semantic cues when they decoded the text.

Retrospective Miscue Analysis (RMA) is an instructional approach. It is a discussion between the instructor and the student over his or her reading miscues and how the miscue information can be translated into instruction (Goodman, Y. & Marek. A.,1996). RMA is grounded in Vygotsky's (1978) social constructivist framework. According to Vygotsky, human learning has a specific social nature, and reading is a process rooted in social interaction. RMA is most commonly used for struggling readers who have difficulties in making meaning when reading texts to heighten a reader's awareness of his/her reading process (Theurer, 2010). RMA encourages readers to understand and value their own knowledge of language rather than labeling themselves as non-readers or poor readers. The procedure has the instructor analyze reader's miscues and view them as attempts to construct meaning rather than viewing them as failure to learn. Most of the RMA research uses small samples, such as single case or multi-case studies due to the nature of RMA that emphasizes a one-on-one instructional approach utilizing the reader's own miscues in reading instruction.

Theurer (2010) used one case studying a young adult struggling reader through RMA and focused on the changes of the reader's reading strategies and behavior patterns after the RMA sessions. He concluded that the RMA sessions empowered the reader to overcome difficulties with knowledge about the reading process, and allowed the reader to take more risks and develop confidence in his/her reading abilities.

Paulson and Mason-Egan (2007) also did RMA research for struggling postsecondary readers. They discussed theoretical underpinnings of RMA and provided detailed procedures for implementing RMA. Examples from several RMA sessions that illustrate RMA procedures were presented. In the conclusion, the researchers stated that "throughout the RMA process, readers are engaged in exploration, reflection, and evaluation as a mean to gain insight, set goals, monitor progress, and make necessary changes in their reading actions" (p. 10). They also mentioned that "RMA may be a useful method to support students with diverse learning styles, including students diagnosed with learning disabilities. Second-language learners as well as nontraditional college students may benefit from RMA as well" (p. 10).

Impact of psycholinguistic theory of reading on second/foreign language reading. The influence of Goodman's and other psycholinguistic researchers' work led to a new era in second language reading theory (Barnett, 1989). Before the appearance of the psycholinguistic model of reading, the early work in foreign language reading originated from reading in English as a second language. According to Carrel (1988), second language reading was assumed a rather passive, bottom-up process. The reading was viewed primarily as a decoding process of reconstructing the author's intended meaning by recognizing the printed letters and words, and building meaning for a text from the smallest textual units, such as letters and words to larger units, such as phrases, clauses, intersentential linkages.

Second or foreign language reading and reading comprehension were viewed as being essentially decoding problems, deriving meaning from print (See example, Plaister, 1968; Rivers, 1964, 1968; Yorio, 1971). Furthermore, reading in a second

language was viewed primarily as an adjunct to oral language skills (Fries, 1945, 1963, 1972). Decoding sound-symbol relations and mastering oral dialogues were considered to be the primary steps in the development of reading proficiency.

Since the end of the 1960's, the importance of background comprehension was recognized. Fries (1972) pointed out that failure to relate the linguistic meaning of a reading passage to cultural factors would result in something less than total comprehension. Rivers (1968) also recognized the importance of connecting language to culture for non-native readers to have a complete understanding of the meaning of a text.

However, despite acknowledging the role readers' background knowledge, and, in particular, culture-specific knowledge plays, these concepts did not attract much attention in early theories and research of second language reading, and the methodological and instructional focus remained on decoding, or a bottom-up process of reading.

The appearance of psycholinguistic theory of reading (Goodman 1967, 1971; Smith, 1971) exerted a strong influence on views of first or native language reading and later impacted second or foreign language reading. The theory not only placed the second or foreign language readers in the role of active participants in the reading process, making and confirming predictions and processing information, but also acknowledged that readers' prior experience and background knowledge play a significant role in reading. The background knowledge includes the various levels of linguistic knowledge and prior background knowledge of the content area/topic of the

text (“content” schemata) as well as the knowledge of the rhetorical structure of the text (“formal” schemata).

By the early 1970s, psycholinguistic reading theory appeared largely in the literature on English as a second language reading. Reading researchers began to relate the psycholinguistic reading theory to second language reading studies. For example, Eskey (1973) stated that the decoding model popular in the field of second language learning was inadequate as a model of the reading process because it underestimated the contribution of the reader and failed to recognize that students utilize their expectations about the text based on their knowledge of language. Other second language reading specialists such as Clark and Silberstein (1977), Clarke (1979), Mackay and Mountford (1979), and Widdowson (1978, 1983) began to view second language reading as an active process in which the second language reader is an active information processor who predicts while sampling only parts of the actual text. Since 1979, the psycholinguistic theory has been used to advance the field of second language reading (Carrell, 1981, 1982; Carrel & Eisterhold, 1983; Coady, 1979; Hudson, 1982; Johnson, 1981, 1982; Steffensen, Joag-dev, & Anderson, 1979).

In summary, as Barnett (1989) stated, Goodman’s (1967) concept of predicting and Smith’s (1971) concept of anticipating can be applied to the research of reading among adult second and foreign language learners, because they are already more or less proficient readers in their native language and have the ability to make predictions about a text. Their wide-ranging general knowledge may also play a large role in their reading comprehension. However, other second language theorists think that a purely top-down conceptualization of the reading process represented by psycholinguistic

reading theories makes little sense for second and foreign language readers when they read texts in a target language that usually contains a large amount of unfamiliar vocabulary for them.

Interactive and Interactive-Compensatory Models of Reading

Goodman's (1967) psycholinguistic reading theory expanded the view of reading to a broader act of communicative and active meaning-making processes. However, as a linear model, it has its limitations. The interactive models of reading represented by Rumelhart (1977, 1994) and Stanovich (1980) correct the flaws in previous linear reading models and argue that reading is a nonlinear-process and factors at all levels interact when readers approach the text. Although Rumelhart and Stanovich's interactive models have some differences, they both regard reading as an interactive process.

Rumelhart's interactive model of reading. Rumelhart (1977, 1994) proposed the first nonlinear, interactive model of reading. Before he developed his model, he had noticed limitations in Gough's (1972) and LaBerge and Samuel's (1974) models. According to those models, the reading process is a linear one, and information only passes from a lower level to a higher level. Rumelhart realized that linear, bottom-up models of reading that did not conceptually allow for higher-level thinking to influence lower-level processing had serious flaws. He observed and found that higher-level processing, such as comprehending the meaning of a sentence, influenced text processing at a lower level, such as word identification during reading. As a result, he created his interactive reading model. In this model, a variety of processors converge on visual information simultaneously. The simultaneous processing of syntactic

information (referring to word order within sentences), semantic information (related to message construction), orthographic information (related to visual input), and lexical information (referring to word knowledge) allows for higher-level and lower-level processes to simultaneously interact on the visual input.

Stanovich's interactive-compensatory models of reading. Stanovich (1980) reviewed the existing reading theories and categorized reading theories into two different types: "bottom-up" and "top-down" models. By his definition, "bottom-up" models present reading as a series of discrete stages through which information passes. The lower levels of information, such as letter identification, pass to the higher levels of information, such as construction of the meaning of the message. In this so called "bottom-up" model of reading, first letters are identified, then sounds are attached to them, then word meaning is added, and finally all the words are processed and the sentence's meaning is understood. The models of Gough (1972) and LaBerge and Samuel (1974) are examples of "bottom-up" models of reading. Stanovich found that an important shortcoming of these models is lack of feedback. They do not allow what occurs later in the reading process to influence what occurred earlier. For example, in bottom-up models, it was difficult to account for sentence-context effects and the role of prior knowledge of text topics as facilitating variables in word recognition and comprehension.

The other type of reading model is "top-down". "Top-down" models suggest that the reading process is driven by what is in the reader's head rather than by what is on the printed page. It also emphasizes the importance of a reader's background knowledge. Readers use all resources of information and background knowledge to

predict and hypothesize the upcoming text. When the upcoming text is consistent with a reader's hypotheses and predictions, the reading process progresses rapidly and smoothly. The skilled readers can sample the text and confirm their hypotheses and predictions. However, when the upcoming text is inconsistent with the reader's expectations, reading is slowed down. The unskilled readers attend more closely to the actual printed text.

Psycholinguist theory (Goodman, 1967; Smith, 1971) represents a "top-down" model of reading. Bottom-up models have their problems, so do the top-down models. One of the problems is that for many texts the reader has little knowledge of the topic and cannot generate predications. A more serious problem is that even if a skilled reader can generate predictions, the amount of time necessary to generate a prediction may be greater than the amount of time that skilled readers need to simply recognize the words. In other words, it is easier for a skilled reader to simply recognize words in a text than try to generate predictions.

In addition to summarizing and critiquing the key points of "bottom-up" and "top-down" models of reading, Stanovich (1980) extended Rumelhart's (1977) interactive model to include the idea that not only are text processors interactive and non-linear, but that they also compensate for each other. This means that if one processor is not working well, or has insufficient data, the other processor compensates for it. The compensation can happen for deficiencies at any level. For example, if a reader is weak at decoding a word he does not know, he may use sentence context and prior knowledge to figure out the sound of the word. On the other hand, if the reader is skilled at word recognition, but does not know much about the text topic, he may

simply recognize the words one by one on the page and rely on bottom-up reading strategies to comprehend the text. Stanovich stated,

> Interactive models…. assume that a pattern is synthesized based on information provided simultaneously from several knowledge sources. The compensatory assumption states that a deficit in any knowledge results in a heavier reliance on other knowledge sources, regardless of their level in the processing hierarchy. (Stanovich, 1980, p.63)

Review of Studies of Second Language /Foreign Language Reading

The psycholinguistic reading theories, especially the top-down reading processing perspective, had a profound impact on second language reading. It became a substitute for the bottom-up, decoding view of reading, rather than its complement. However, efficient and effective reading, either in a first or second language requires both top-down and bottom-up strategies operating interactively (Rumelhart, 1977, 1980; Sanford & Garrod, 1981; van Dijk & Kintsch, 1983). This is especially critical, because it is decided by the nature and characteristics of the L2/FL reading.

Koda (2007) did a review of L2 reading that can also be applied to foreign language reading. First, L2 reading is unlike L1 reading because it involves two languages. The dual-language involvement implies continual interactions between the two languages. L2 reading is cross-linguistic and more complex than L1 reading. Second, the previous literacy experience in the L1 language affects L2 reading positively or negatively. Third, L2 reading encompasses a wide range of learners of different ages and with diverse L1 backgrounds. Fourth, language transfer is a major theoretical concept in L2 research. What is transferred is not a set of rules, but the

internalized mapping patterns presented differently by bilingual and monolingual readers. Fifth, the concept of reading universals is critical. Although the ultimate goal of reading is to construct meaning based on the encoded information from text, language-specific demands are presented when readers read a particular language and its writing system.

Schema Theory Model and Its Implications for Second/Foreign Language Reading

The role of background knowledge in language comprehension is addressed by schema theory (Bartlett, 1932; Rumelhart, 1980). The previously acquired knowledge is called the reader's background knowledge, and the previously acquired knowledge structures are called schemata (Bartlett, 1932; Adams & Collins, 1979; Rumelhart, 1980). According to schema theory, comprehending a text is an interactive process between the reader's background knowledge and the text. There are different types of schemata. The first type is schemata related to language knowledge (i.e., syntactic, semantic, and grapho-phonic knowledge). The second type is schemata that include background knowledge of the formal, rhetorical organizational structures of different types of texts. The other schemata are content schemata, which refers to background knowledge of the content area of a text (Carrell, 1983b). When a reader fails to activate any one of the schemata, formal or content, during reading, it will result in various degrees of non-comprehension. As a L2 or FL reader, the content schema may be culturally specific and is not part of a particular reader's cultural background. In the comprehension process, L2/FL readers attempt to activate related schemata to make sense of the text. However, the efforts often fail if the reader does not possess appropriate schemata or cannot access it.

Therefore, schema theory has obvious implications for L2/FL readers. Properly developed language schemata, such as knowledge about the sounds of the language and related decoding skills, are required for L2/FL readers to activate relevant schemata and gain comprehension. Knowledge of text structures is also critical in L2/FL reading. Culture-specific values within the content schemata can be significant factors in comprehension if the values expressed in the text differ from the values held by the reader L2/FL (Rivers, 1968).

Interactive Approaches to Second Language /Foreign Language Reading

Although psycholinguistic reading theory has led to extensive research on L2/FL reading, interactive models of reading assume that higher-level skills and lower-level skills are interactively available to process and interpret the text. Many L2/FL researchers think that interactive approaches to reading hold much promise for understanding the complex nature of reading, especially for L2/FL reading (Carrell, 1988).

The reasons can be summarized as follows. First, a reader's background knowledge is one of the most important factors and easily neglected in L2/FL reading. As Carrell and Eisterhold (1983) discussed, even though the psycholinguistic model of reading sees background knowledge as an interaction of factors, it originally focused on L1 reading and does not emphasize culture-specific background knowledge in L2/FL reading. An interactive approach suggests when L2/FL readers deal with culture-specific texts, they need to possess and activate the appropriate culture-specific schemata.

Second, linguistic deficiencies are inhibiting factors in L2/FL reading (Carrel, 1988; Clarke, 1979; Cohen, Sherrod, & Clark, 1986). For example, in English as a second language reading, Grabe (1988) mentioned that L2 readers usually do not begin reading English with the same English language knowledge available to English-speaking children. It cannot be assumed that readers have a large vocabulary or basic syntactic structures already available for them to use.

Third, various skill deficiencies are common for L2/FL readers, especially the need for readers to have extensive vocabularies to gain comprehension in L2/FL reading. Stanovich's (1980) interactive-compensatory reading model explains the problem: Readers who are weak in one strategy will rely on other processes to compensate for the weaker process. In his view, lower-level word recognition, grapho-phonic information, and semantic and syntactic information all play a significant role in reading comprehension, but the reading process is mainly orientated toward lower levels of processing. Stanovich (1982) argued that a deficiency in the word recognition processes could be compensated for by higher-level knowledge, such as the semantic and syntactic information from the context. This is especially meaningful in L2/FL reading. Grabe (1988) discussed the phenomenon of the overreliance on text or context that Carrel (1988) also stated. He thinks that Stanovich's interactive-compensatory approach can provide the best explanation. That is, the students who lack relevant schemata may overcompensate in a slow text-bound manner or overcompensate by guessing. In contrast, students who are not capable of rapid lower-level processing may compensate by persevering word by word, or they may overcompensate by guessing too often.

Fourth, the interactive reading model considers L2/FL reading comprehension to be a process involving the combination and integration of both lower-level and higher-level knowledge sources (Bernhardt, 1991). A number of empirical studies were conducted to investigate aspects of ESL reading. Researchers also conducted several cross-linguistics studies to investigate foreign language reading. Devine (1988) investigated the role of English L2 readers' conception of reading and its relation to reading performance. Her study showed that the way a reader thinks about the reading process is directly related to different types of reading performance. Specifically, when a sound-centered approach to reading combined with low proficiency results in a severely restricted transfer of effective reading skills to the second language, whereas a meaning-centered approach to reading may mitigate the effects of low general language proficiency and allows the reader to successfully transfer good L1 reading strategies to the L2. She also concluded that the ability to effectively combine "bottom-up" and "top-down" processing is required for successful reading.

Steffensen (1986) studied the question of what changes occur in text structure when a reader recalls a native and a foreign text. She investigated the relation between cohesion and coherence in terms of second language readers' recall of culturally familiar and unfamiliar texts. She explored whether coherent recalls based on good reading comprehension of a culturally familiar text are necessarily more highly cohesive than less coherent recalls based on less reading comprehension of culturally unfamiliar text. Her findings suggested that although there are differences in reading comprehension due to the interaction of readers' prior cultural knowledge, explicit cohesion is not necessarily an indication of comprehension. In terms of reading, a

variety of strategies must be used. Steffensen's findings suggested that other means of text analysis are needed to measure the coherence of reading comprehension.

Cohen et al. (1986) and Alderson and Urquhart's (1988) studies investigated the interactive nature of second language reading in the domain of English for special purposes, science and technology. Cohen et al. (1986) revealed that specific text properties caused reading difficulties for readers from different disciplines. Alderson and Urquhart (1988) explored the interaction between a second language reader's background knowledge of the discipline and the type of discipline-specific information demanded by the text. They all questioned whether there are such things as "general purpose" texts that don't demand specialized information. They found that discipline-specific information possessed by the second language reader dramatically interacts with the discipline-specific nature of the text to affect reading performance.

Hudson's (1982) study also demonstrated the interrelation between language proficiency and background knowledge in second language reading. Hudson's results showed that proficiency in the second language may limit reading performance, but relevant background knowledge possessed by the reader may interact with that language ability to facilitate reading comprehension.

In addition to the above studies that are focused on the role of high-level knowledge in the interaction process in L2 reading, another important view regarding interactive approaches is that efficient lower-level processes are important components of fluent reading.

Many L2 reading researchers (Bernhardt, 1991;McLaughlin, 1990; Nassaji, 2003; Segalowitz, 2000) also believed that less-skilled readers are those who are

deficient at processing lower-level textual information rather than at using high-level conceptually-driven data (Nassaji, 2003). L2 reading is a complex cognitive task. Text comprehension builds on automated basic processing skills, such as development of adequate language knowledge and automatization of word-level decoding (Mclaughlin, 1990).

There are several cross-linguistic studies on the role of word recognition and grapho-phonic processes in L2 reading (e.g., Akamatsu, 1999; Durgunoglu, 1997; Gottardo, Yan, Siegel, & Wade-Woolley, 2001; Haynes & Carr, 1990; Koda, 1998, 1999; Muljani, Koda, & Moates, 1998, 1999; Muter & Diethelm, 2001). These researchers all focused on lower-level processes in reading. Although text processing studies showed that reading is an integration process that is influenced by both higher-level semantic/contextual information and lower-level textual information, many researchers such as Horiba (1996, 2000) and Tailefer (1996) found that linguistic ability is more important for L2 readers when they read various L2 texts. Tailefer also found that high-proficiency level L2 readers relied more on textual and linguistic processes than their L1 high-level reading strategies. L2 readers' reading strategies from their L1 was not more important than their L2 linguistics knowledge. Other L2 researchers also shared similar views. Bossers (1992), Cummins (1980), and Cziko (1980) also found that when the reading task became more cognitively complex, the role of linguistic ability became even more crucial (Nassaji, 2003).

From the view of interactive reading theories, Hoover and Dwivedi (1998) and Nassaji (2003) compared the efficiency of syntactic processing among the fast and slow groups of French L2 readers and found that the slower L2 readers used syntactic

processing less effectively than the faster readers. Ulijin and Strother (1990), however, found that simplification of the syntactic structures of L2 technical texts did not lead to better comprehension among L2 readers. Based on their findings, they argued that L2 reading needs a considerable amount of lexical semantic processing, rather than more syntactic processing.

To respond to the methodological problems of either focusing on the higher-level or lower-level knowledge in L2/FL reading studies, Nassaji (2003) conducted his study using a component skills design involving measures of syntactic and semantic processing skills along with measures of word recognition, phonological, and orthographic processing skills. He included these higher-level and lower-level component processes in one research design and investigated the role of higher-level syntactic and semantic processes as well as lower-level word recognition and grapho-phonic processes in ESL reading comprehension. In particular, his study examined which of these processes can discriminate skilled from less-skilled L2 readers. He studied 60 adult advanced ESL readers and drew the conclusion that there was a strong relation between lexical/semantic processing skills and reading comprehension. It confirmed previous research findings in both L1 and L2 reading that semantic processing is the key to reading comprehension. He also found that the efficiency of lower-level processing, such as word recognition and grapho-phonic processes, distinguished skilled from less-skilled readers. However, simply knowing the meaning of words or having a good knowledge of L2 grammar may not be enough. A fluent reader is able to process words and their relations efficiently in the context. In particular, word recognition and grapho-phonic processes should receive systematic

attention in situations where the target language uses orthography different from the readers' L1 orthography.

Taken together, the L2/FL reading studies that adopted the interactive approach to reading either focused on the role of higher-level knowledge, such as syntactic, semantic, and reader's background, in L2/FL reading, or the lower-level knowledge, such as word recognition, grapho-phonic processes, and other linguistic deficiency in text processing. Little research has been done to address the contribution of different dimensions of language proficiency to comprehension of L2/FL texts interactively.

Major Characteristics of Chinese Orthography and Relation of Script-speech in CFL Reading

Chinese reading is a complex process and also plays an important role in developing Chinese language proficiency. The research on the CFL reading process has attracted great attention even though such studies are scarce (Ke, 2012).

Character Recognition and Strategies for Learning Characters

The Chinese writing system uses Chinese characters instead of alphabetic letters. It is a very challenging for English speakers to recognize Chinese characters and decode them. Most existing CFL reading research is focused on Chinese character recognition and learning strategies. Chinese characters are organized by strokes, and each character has one or more parts. The structures of Chinese characters can be divided into top-bottom, left-right, and outside-inside ones based on the different positions of the parts. Although some scholars consider Chinese a logographic language, many other scholars argue that Chinese orthography is logographic-phonetic,

because many Chinese characters are comprised of a radical (semantic) and a phonetic component (Katz & Frost, 1992; Cynthia & Ruan, 2012).

CFL character recognition research includes studies on how the number of strokes of a Chinese character and the position of parts of a character affected CFL learners in their effort to recognize Chinese characters. Ke (1996) investigated the relation between character recognition and production among first year non-heritage CFL learners. He found that CFL learners performed better on character recognition than production. The low-density characters are easier to write than high-density characters for CFL learners, but character density has no effect on character recognition. He also found that "partial information of a character can lead to recognition, but total mastery of the character is required for accurate production." (Ke, 2012, p.47). Jiang (2007) found that the number of strokes affect reader's recognition time but not accuracy. As for how different structures of characters (top-bottom, left-right, and outside-inside, etc.) affect recognition, several scholars have different conclusions and could not reach an agreement.

Recently, research on Chinese character learning has been extended from Chinese character recognition to learning strategies. As Ke (2012) summarized, although CFL students were expected to employ knowledge about radicals and phonetic components of characters as aids in learning Chinese characters, these strategies were not the methods most favored by CFL students. Instead, students tended to use mechanical strategies. Their most favored methods were whole character memorization, rote repetition, and creating stories not related to the radical or phonetic components.

The studies about English speaking CFL learner's difficulties in recognizing and learning Chinese characters show that decoding is one of the most difficult aspects of Chinese reading and always an on-going challenge in CFL reading.

Studies on the Relation between Naming a Character and Knowing Its Meaning

The debate on the exact nature of Chinese writing system is an ongoing one. Some consider that it is logographic. Based on DeFrancis' (1984) statistics, more than 90% of Chinese characters are picto-phonetic and each character includes two components with one element indicating meaning and the other sound. Among these compound characters, 33% of the phonetic component (the sound part) in the characters reveals their exact pronunciation. Wen (2012) also estimated that more than 50% of the compound characters provide phonological information through the inherent phonetic component (Wen, 2012).

Perfetti, Zhang, and Berent (1992) proposed the universal phonological principle. They argued that for alphabetic or non-phonetic language, when readers read the text, they all gain meaning through the phonologic process. Everson (1998) investigated the relation between correct pronunciation and correct identification (knowing the English meaning) for CFL non-heritage learners. He found that there was a strong relation between pronunciation and meaning identification and the accuracy rate was more than 90%. As Ke (2012) pointed out, "these results suggest that retaining characters is a difficult task and that the students seemed to rely on their spoken language skills for remembering the meaning of these characters." (p.48). In other words, once a CFL learner has mastered a character/word (both sound and meaning), if

the learner can still correctly pronounce the character/word in a new reading text, it is likely that he/she will be able to understand the meaning of the character.

However, to my knowledge, very little research has been done to investigate whether CFL learners can comprehend a text even if they are not able to identify the sounds of all the characters in a text.

The Relation between Character Development and Vocabulary Development

The results from existing CFL studies indicate that the relation between Chinese character development and vocabulary development is complex. Ke (2012) summarized the findings from previous studies and stated that his research on Chinese word structures and features and the Chinese word formation system showed that this relation is complex. Most modern Chinese words are compound words that involve both phonetic and semantic clues. Individual characters have multiple meanings. Each new meaning of the character can only be learned in new linguistic situations or contexts. This happens very often within a compound word. In addition, constituent characters within a compound word may have different frequencies of occurrence. The multiple meanings of Chinese characters often provide partial or misleading cues for CFL learners to identify the right meaning of compound words. For instance, CFL learners may come cross compound words that consist of characters they had learned before, but cannot infer the word's accurate meaning. For example, learners may fail to activate the correct meaning of 单 (a sheet) in 菜单 (menu); instead, they may activate the wrong meaning of 单 (single) from 单亲 (single parents). In addition, there is no word boundary in a Chinese character text script. Everson and Ke (1997) conducted a study on CFL reading strategies and found that intermediate CFL learners had trouble

processing characters accurately and quickly and experienced difficulty isolating and identifying meaningful word units in the text. They also found that much of the reading comprehension breakdown was caused by inadequate word recognition ability.

Miscue Studies on CFL Reading

Compared with studies of oral reading miscues made by ESL learners, very few studies have been done that examined reading miscues in CFL reading.

Sergent (1990) used the modified miscue inventory and analyzed Chinese miscues made by 20 native English-speaking American CFL learners at the advanced and highly-advanced levels. He found that readers at both levels produced more graphical/visual miscues than contextual miscues in reading.

Another researcher, Li (1998), examined six beginning-level CFL readers. Her study found that beginning level readers relied more on contextual clues than grapho-phonic ones.

Wang (2006) replicated Goodman's (1967) miscue analysis for L1 English and studied 16 American CFL college students' reading processes and developed a Chinese taxonomy. In the study, Wang kept all the major categories in Goodman's Taxonomy. Some of the categories were directly transferred into the Chinese Taxonomy without any modification, such as correction and dialect. On the other hand, Wang suggested that Chinese differs greatly from English in many aspects such as morphology, phonology, and syntactic structures. Therefore, a number of modifications were needed to make the Goodman Taxonomy more applicable to reading in Chinese. She concluded the miscue patterns produced by the L2 Chinese readers are strikingly similar to the miscue patterns produced by the readers in miscue studies of English and other

languages. This demonstrated that readers of all writing systems make use of cues from grapho-phonic / grapho-morphemic, lexico-grammar, and semantic levels to get to meaning, regardless of the differences in writing systems.

The review of the studies on miscue analysis of CFL reading produced two different conclusions. Some researchers argued that CFL Chinese readers' reading behaviors and strategies appear to be different from or in conflict with reading behaviors and strategies employed by readers of alphabetic languages. On the other hand, researchers such as Wang (2006) concluded that CFL Chinese readers used similar L1 English and other L2 language readers' reading strategies. Certain processes are universal to reading in different languages, and they could be explored by doing miscue analysis. However, she also indicated that there were language-specific effects on the use of reading strategies and the selection of language cues in reading Chinese.

Conclusion

The literature review has led to several important understandings that support the present study. First, psycholinguistic theory offers a valuable theoretical lens for research of first language and foreign language learning. Psycholinguistic reading theory argues that reading is an active meaning-making process and emphasizes the active role of readers and their background knowledge in reading. The prediction (Goodman, 1967) and anticipation (Smith, 1971) theories of reading apply to skilled FL/L2 readers with a certain level of language proficiency, because they can use their native and foreign language skills and wide-ranging background knowledge to make predictions about a text to ultimately obtain comprehension. However, the theory does not fully capture FL readers' reading behaviors and strategies when they encounter a

large amount of unfamiliar vocabulary in a text during their FL reading. The difference in the relation between script and speech makes it difficult for CFL learners to transfer their English reading strategies to Chinese reading.

Second, miscue analysis is an effective way to analyze reader's oral miscues to reflect the psycholinguistic processes in which a reader engages while he/she is reading. The reader's oral reading errors can be analyzed and serve as a window through which FL/L2 reading processes and reader's reading behaviors can be more easily viewed and understood.

Third, different reading theories and models impact foreign language reading research in different ways. Interactive reading theory and interactive-compensatory model of reading posit that text processes are interactive and nonlinear, and they also compensate for each other. The different dimensions of language proficiency contribute to comprehension of L2/FL texts interactively. These two theories are complementary to psycholinguistic theory in describing and explaining the various aspects of reading strategies and processes involved in Chinese as a foreign language reading.

Second language acquisition theories and research have guided and influenced CFL research and instruction. In return, studies of CFL reading have also complemented and contributed to the general field of second language acquisition. The CFL reading process has received growing attention in L2 Chinese/CFL research. However, most of the studies focused on how CFL readers develop basic Chinese character recognition skills, word recognition, and the strategies used by CFL students to learn characters. There is a very limited number of studies that investigated CFL reading strategies and processes. Very little research can be found that investigates CFL

reader behaviors and processes related to oral reading and comprehension of different types and combinations of Chinese scripts.

Chinese as a foreign language education is an emerging field, as is CFL research. In order to push the field forward and to better inform CFL teaching and learning, there is a need for more research that investigates CFL readers' behaviors, strategies, and processes. This study is an answer to the call.

CHAPTER 3: METHODS

Methods

This chapter introduces the methods of this study. The two research questions are restated as follows.

Research Questions

Research question 1: What are the major patterns of oral reading behaviors of American CFL college learners when they read text in three different conditions: Chinese character only, pinyin only, and character with pinyin?

Research question 2: How do different text conditions impact CFL learners' reading comprehension?

Research Design

This study employs both quantitative descriptive and qualitative measures. Running records, an important source of data, were taken while each student read the text orally and answered reading comprehension questions. The variables include the number of reading errors (i.e., meaning, structure, visual errors, and error rate of all type of errors), and the comprehension scores from three different text conditions: Chinese characters only, pinyin only, and Chinese characters with pinyin. The data were analyzed to obtain the mean and standard deviation of each variable.

The participants were also interviewed after they finished reading the texts orally and answering the questions. The interviews were transcribed and analyzed. The findings were used to triangulate the results from quantitative data analysis.

Table 1 displays the questions, data sources, and data analysis that were conducted to answer the research questions.

Table 1

Research Questions, Data Sources and Data Analysis

Questions	Data Sources	Data Analysis
What are the major patterns of oral reading behaviors of American CFL college learners when they read texts in three different conditions: Chinese character only, pinyin only, and character with pinyin?	1. Runing Records (meaning, structure, visual errors, and error indices) 2. Interview scripts	1. Descriptive statistics 2. Qualitative constant comparison data analysis
How do different text conditions impact CFL learners' reading comprehension?	1. Comprehension scores in three text conditions 2. Interview transcripts	1. Descriptive statistics 2. Qualitative constant comparison data analysis

Participants

The participants in this study were 21 intermediate-level American college students without a Chinese background. They were learning Chinese as a foreign language (CFL) at a public university in the southwest region of the United States. The students had studied Chinese for four semesters at the time they participated in the study. During the first two semesters, they took five 50-minute Chinese classes each week, and during the third and fourth semesters, they had three classes each week. The CFL courses were designed to help students acquire basic mastery of modern Chinese in listening, speaking, reading, and writing using proficiency-based instruction. The students could recognize 1,500-2,000 commonly used Chinese characters and had mastered the basic Chinese grammar patterns and sentence patterns. According to the

statistics published by the Chinese National Language Committee, there are about 2,500 most commonly used Chinese characters, and they comprise 99% of the characters used in daily newspapers and magazines. Students who know 2,000 Chinese characters should be able to read and have adequate comprehension of the chosen reading materials at the instructional level in un-aided reading.

Participants were first separated into three groups (H, M, L) based on their past reading performance and a benchmark test using articles (Appendix A) taken from a released College Board AP Chinese Test. The articles were appropriate for college intermediate-level readers. Next, they were equally divided into three heterogeneous groups so that each group contained the same number of participants at high, medium, and low reading levels. Furthermore, the students in each group were asked to read three different articles, each in a different text condition: Chinese characters only, pinyin only, or Chinese characters with pinyin. See Table 2 below for a description of the conditions of the study.

Table 2

Participant Groups

	Article A	Article B	Article C
Group 1 Reading	Character version	pinyin	Character +pinyin
Group 2 Reading	Pinyin version	Character +pinyin	Character
Group 3 Reading	Character + pinyin	Character	Pinyin

For example, students in Group 1 read three articles: They read Article A (character only), Article B (pinyin only), and Article C (both character and pinyin). This

practice is implemented to avoid the confounding effect caused by reading the same text repeatedly even though in different text conditions.

Procedures

Data Collection

Collection of linguistic data through running records. The data include three oral reading samples that were recorded using running records (Clay, 2000) with 21 participants. Data collection was conducted following the running record protocols that guide an assessment of text reading (Clay, 2000). This method was originally designed to assess a child reading orally from any text.

> Running Records can provide evidence of how well children are learning to capture what the readers said and did while they are reading the given text and to use statistical analysis to analyze the data, because a Running Record makes researchers judge what the reader already knows, what the reader attends to, and what the reader overlooked. (Clay, 2000, p. 50)

Beginning to intermediate-level CFL readers share certain characteristics similar to young beginning readers when engaged in oral reading of Chinese texts. Running records can record their reading behaviors, and the analysis of running records can provide insight into their reading behaviors, reading processes, and comprehension. The following procedures are followed in collecting linguistic data using a running record:

A. Text selection: The texts used in this study were chosen from the AP Chinese Test 2007 released by the College Board. Reading passages from this test were selected because the test is a widely accepted standardized Chinese as a foreign

language test in America. The difficulty level is equivalent to that of a typical text for the fourth semester CFL Chinese class in college, which matches the reading level of most participants in this study. The three different versions of the texts (Chinese characters only, pinyin, and pinyin with Chinese characters) were provided for participants to read aloud in said order (Appendix B).

B. Conventions for recording oral reading of Chinese texts were adopted based on the conventions developed by Clay (2000) for L1 English readers. The process for taking running records is as follows:

- Mark every word read correctly with a tick (or check).
- Record an incorrect response with the text under it.
- If a child tries several times to read a word, record all his/her trials.
- If a child succeeds in correcting a previous error this is recorded as "self-correction".
- If no response is given for a word it is recorded with a dash. Insertion of a word is recorded over a dash.
- If the child baulks, unable to proceed because he/she is aware he/she has made an error and cannot correct it, or because he/she cannot attempt the next word, he/she is told the word (written T).
- An appeal for help (A) from the child is turned back to the reader for further effort before using T. Say and mark "You try it".
- Sometimes the child gets into a state of confusion and it is necessary to extricate him/her. The most detached method of doing this is to say "Try

that again", marking TTA on the record. This would not involve any teaching, and the teacher may indicate where the child should begin again.

- Repetition (R) is not counted as an error behavior. Sometimes it is used to confirm a previous attempt. Often it results in self-correction. It is useful to record it as it often indicates how much sorting out the reader is doing.

C. Comprehension check: After reading aloud, the participants answered multiple-choice questions developed by College Board to check the comprehension. All the questions and answers were provided in English, because according to Clay (2005), the answers to comprehension questions can vary according to the difficulty level of the sentence structure of the question as well as the reader's actual reading ability. Using the reader's native language for questions and answers could avoid additional difficulties that may be unrelated to comprehension.

Qualitative data collection procedures. In order for me to understand the students' reading processes and behaviors when they read different versions of the text, I conducted individual interviews. The qualitative data are interview transcripts. I audio-recorded the interviews and later transcribed the interviews.

Participant interviews. Semi-structured interviews were conducted with all participants. The semi-structured interview protocol (Appendix C) was developed based on the questions in the Burke Interview Modified for Older Readers (BIMOR; Burke, 1980). The protocol was used to find the oral reading strategies used by CFL American college learners when reading Chinese texts.

Each participant went through a 20-30 minute interview. They were asked to reflect on understanding and use of reading strategies when they read Chinese texts. Each interview was recorded. During the interview, the participants were also asked to reflect on the three different versions of the given reading text and describe the parts they found difficult. They were also asked to engage in retrospective reading and comment on the errors they made while they were reading the text for the study.

Examples of the questions from the BIMOR include "When you are reading Chinese texts and you come to something that gives you trouble, what do you do? Do you ever do anything else?" "What is the most difficult text you have to read?" What do you think of yourself as a Chinese reader?" These questions serve to shed light on how different processes work interactively in CFL reading. The participants' interviews were recorded and transcribed and used for qualitative analysis and to illustrate patterns of their reading behaviors and processes.

Immediately following the reading and before I began to analyze the running records, I wrote notes on what I just observed and a quick summary of each participant's reading. This included an overall reaction to the participant's reading and my comments on what the reader did well and/or struggled to do.

Data Analysis

Three types of data analysis were employed in this study, which included linguistic analysis, quantitative descriptive statistics, and qualitative analysis based on the different types of data collected.

Linguistic analysis. Multiple steps of linguistic analysis were conducted in this study. The first step is to identify all errors. Informed by Clay (2000)'s procedure for

error analysis (Appendix D), I began recording all errors and assigned an initial code to each error. For example, when a participant misread the word “申请 / apply” as “电请”, this error was coded as a substitution because the participant substituted a different character for the target character in the actual text. Further analysis of the error indicated that the error and the actual character look similar visually. Therefore, this error was coded as substitution in Chinese – visual.

All potential error categories and subcategories were identified. They were tested against the complete set of oral reading errors made by all participants until no new categories or subcategories could be identified. New categories and subcategories were added and existing ones were deleted, revised, or refined in the iterative process of data analysis until the data were saturated.

An initial protocol was developed to represent all categories and subcategories of errors for each version of texts. Each protocol was constantly tested against the complete set of errors related to the specific text condition to ensure that the all the errors were fully captured by the protocol. Eventually, two protocols were finalized. One protocol (Table 3) is for analyzing the errors made by the participants when they read the Chinese character only texts. The second protocol (Table 4) is for the analysis of the errors made when the participants read Chinese character with pinyin and pinyin only texts.

Table 3

Protocol for Coding Oral Reading Errors of Chinese Character Only Texts

Types of oral reading errors			Explanations	Examples
Substitution error	Substitution in Chinese	Visual	The error is caused by the visual similarity between the character in the text and the substitute character.	a.主题 /topic → 王 sth./The reader skipped the second character. b.刚刚 /just→ 网网 /It is not a meaningful word. c. 申请 /apply→ 电请 /It is not a meaningful word. d.收件人/recipient→ 叫件人 /It is not a meaningful word. e.预祝 /wish you →服说→视说 /It is not a meaningful word. f.挣点儿钱 /earn some money →净点儿钱 / It is not a meaningful word g.五所大学 /five universities → 五听大学 /It is not a meaningful word.

		Meaning	The error does not change meaning of the character (word) in the context.	a. 旅游 /travel →旅行/travel 旅游 and 旅行 are almost same in meaning. b. 2005 年 10 月 18 日→2005 年 10 月 18 号。 The reader read ”日” as” 号”, but it does not change the meaning, because “10 月 18 号, October 18” is an alternative way of saying “10 月 18 日, October 18”
		Homograph	The error (same written character) has different pronunciation and a different meaning.	都 can be read as “dōu” meaning “both, all” or “dū” in 首 meaning “capital”.
	Substitution in English	English word with general meaning	The error is an English word with general meaning	“明明 and 丽丽”, the reader said in English “They are names.”
		English word with exact meaning	The error is an English word with exact meaning.	a. “星期” One reader said “It is week”. b. “信” one reader said “It is letter”.
		Homonym	The error is an English word with correct meaning but inappropriate for the	我今年学习非常紧张/I have a very intensive schedule for my study this semester. “紧张” has two meanings

	context.	in Chinese depending on context, “tense, intense” or “nervous”. In this sentence, the meaning of “紧张” is intense.
Omission error	The error is an omission.	a.“放假以后我先休息几天”. The student skipped the characters: （放）假，先, 休息, 几 (天). b.好久没跟你联系了。The reader said as “好 something 没跟你 I could not remember 了.”
Boundary error	The error is caused by wrong judgment on word boundaries or incorrectly segmented sentence.	“你上次来信说你申请了五所大学。” /You sent me a letter said that you applied to five universities last time. The reader read as “你上次来/信说你申请了五所大学”. The reader did not realize “来信” was one word, the meaning is “send me a letter”. He changed the meaning to “You came last time”, and this caused the second part of the sentence to be not meaningful in Chinese.
Association error (The errors are associated with Chinese characters.)	The error is caused by association based on a compound word/phrase.	a.“一封信 / a letter” , the character 封 is a measure word for “信 /letter”. They often appear together. So the reader misread “信” as “封”. b. Another reader read a person’s

	name “丽丽” as “美美”, because “美丽”is a word, that means beautiful, 美 and 丽 often appear together as one word, so the reader misread 丽 as 美.
The error is caused by association triggered by the same character.	联系／contact→关系／relationship. One reader didn’t know the word 联系／contact, but he knew another word 关系/relationship. When he saw the character 系, he guessed it must be “关系”.
The error is the antonym of the same character.	a. One reader read“以前／before” as “以后／after” b.“在学校大门的左边/at the left side of the school”, the reader read “左边/left side” as “右边/right side”.

Self-correction. Self-correction is also coded to indicate reader's successful attempt at correcting a prior error. For example, 放假以后我先休/息几天。→放假以后我先/休息/几天。 The reader first thought the boundary of the words was between 休 and 息 and paused at it and realized quickly that “休息/ rest” was one word when he kept on reading and self–corrected successfully.

Table 4

Protocol for Coding Oral Reading Errors of Pinyin Only Texts and Chinese Character with Pinyin Texts

Types of oral reading errors		Explanations	Examples
Boundary error	Single word boundary	The error is cause by incorrect judgment on word boundary.	"shǒu xiān /first", The two syllable word represents one meaning unit, but the readers segmented the words into two separated syllables.
	Phrase boundary	The error is cause by incorrect judgments on a phrase.	"jiěmèi xuéxiào /sister schools" One reader could not figure out when the two words "jiěmèi /sisters" and "xuéxiào /school" are combined, they form a word with a different meaning.
	Sentence structure boundary	The error is cause by incorrect judgments on grammatical unit boundary.	"Wǒ / zhēn xiǎng / zǎo rì / kàn dào / Cháng Chéng"/ I really want to see the Great Wall early. One reader read the sentence "Wǒ / zhēn xiǎng / zǎo rì kàn / dào Cháng Chéng." He segmented the sentence into two parts incorrectly, and said "zǎo rì kàn / see it earlier" and "dào Cháng Chéng"/ arrive at the Great Wall".
Pronunciation error	with meaning change		xiū xi/rest", one reader misread it as "xué xí /study" with meaning changed.
	without meaning change		wǒ men jiù yào fàng jià le. / we will begin our holiday soon. One reader didn't read "yào" accurately in Chinese, but it didn't change meaning of the sentence.

Self-correction. Self-correction is also coded to indicate reader's successful attempt at correcting a prior error. For example, “bǎ /shēn qǐng /xìn/ jì chū qù”/ send out the application letter. One reader finished reading the whole sentence and realized that “shēn qǐng xìn” was one word meaning “application letter” and re-read the sentence correctly following proper word boundaries.

Quantitative descriptive statistics. Quantitative descriptive statistics were conducted and involved the following procedures:

1. Conduct descriptive statistics on the mean error rate, mean oral reading accuracy rate and mean self-correction rate for the three texts (Article A, B, and C) under each text condition. The procedures for calculating the mean error rate are the following:
    - Count the running syllables or characters
    - Calculate mean error rate by dividing the total number of errors by the total number of running characters/syllables: $\frac{Total\ Errors}{Total\ Running\ Words}$
    - Calculating the mean oral reading accuracy rate: 100- $\frac{Total\ Errors}{Total\ Running\ Words} \times \frac{100}{1}$
    - Calculate self-correction rate: $\frac{Self-correction}{Errors+Self-correction}$
2. Conduct descriptive statistics on the mean comprehension accuracy rate for the three texts under each text condition. The following procedures were followed to calculate the mean comprehension accuracy rate: divide the total number of the right answers made by the participants by the total number of the reading comprehension questions after each article.

Qualitative content analysis. Qualitative content analysis was conducted using the constant comparison method (Strauss & Corbin, 1990). I examined the interview transcripts word by word and line by line to develop initial codes. I continued testing the codes until I was not able to identify any new ones. I developed categories after I examined the relation between and among all codes and continued testing all incoming data until all the categories were saturated. All related categories were coded. Finally emerging themes were identified. I allowed the research questions to guide and determine the most prominent themes to report.

CHAPTER 4: RESULTS

Chapter 4 reports the findings of this research study. In particular, results related to the two questions are identified and reported.

The research questions are:

Question 1: What are the major patterns of oral reading behaviors of American college CFL learners when they read texts in three different conditions: Chinese character only, pinyin only, and character with pinyin?

Question 2: How do different text conditions impact college CFL learners' reading comprehension?

Question 1: Major Patterns of the Oral Reading Behaviors

This section reports findings related to Question 1. More specifically, reading behaviors related to the three different text conditions are reported. All types of reading errors associated with a particular text type are explained, and examples of errors are provided to illustrate each error type.

Findings from Miscue Analysis

Reading behaviors related to Chinese character only texts. Table 5 shows the types and frequency of oral reading errors the participants made when reading Chinese character only texts. This table includes several categories of errors. The oral reading behaviors identified include substitution errors, omission errors, boundary errors, association errors, and self-corrections. The various oral reading errors represent different reading behaviors of American CFL college learners. The largest number of errors made by the participants were omission errors. Substitution errors revealed the most variety.

Among substitution errors, there were substitution in Chinese errors and substitution in English errors. There were also word boundary errors and association errors. The association errors were triggered by a visually similar character or the same character.

Table 5 presents the types and frequency of oral reading errors in Chinese character only texts. Table 6 displays the total number of errors by error type in Chinese character only texts. The mean error rate, oral accuracy rate, and self-correction rate related to the Chinese character only texts are presented in Table 7.

Table 5

Types and Frequency of Oral Reading Errors in Chinese Character Only Texts

Types of Oral Reading Errors			Article A	Article B	Article C
Omission error			185	127	188
Substitution error	Substitution in Chinese	Visual	25	19	20
		Meaning	1	3	2
		Homograph	1	1	3
	Substitution in English	English word with general meaning	5	6	6
		English word with exact meaning	5	6	11
		Homonym	1	1	0
Association error	Association error based on a compound word/phrase		3	4	1
	Association error triggered by the same character		7	12	10
	Antonym		2	3	0
Boundary error			3	11	12

Table 6

Total Number of Errors by Error Type in Chinese Only Texts

Types of oral reading errors	Article A	Article B	Article C	Total
Omission error	185	127	188	500
Substitution error	38	36	42	116
Association error	12	19	11	42
Boundary error	3	11	12	26
Total errors	238	193	253	

Table 7

Mean Error Rate, Oral Accuracy Rate, & Self-correction Rate in Chinese Only Texts

	Total number of running characters	Number of participants for running records	Mean error rate	Mean oral reading accuracy rate	Mean self-correction rate
Article A	161	7	1: 4.7	78.7%	1: 375.7
Article B	211	7	1: 7.5	86.7%	1: 211
Article C	167	7	1: 4.6	78.3%	1: 233.8

The number of self-corrections for the Chinese character only texts included 3 self-corrections for article A, 7 for article B, and 5 for article C. The participants made 15 total self-corrections.

Omission. Among the different types of oral reading errors, omissions errors were most common among readers of the Chinese character only texts. For article A, the first group of 7 readers made 185 omissions; for article B, the second group of 7

readers had 127 omissions; and for article C, the third group of 7 readers had 188 omissions. They were all intentional omissions. Omission oral reading errors showed up consistently for all three groups of readers when reading the three Chinese character only texts. When the participants had difficulties reading the Chinese texts, they most often adopted the strategy of omission in order to move on in their reading. When they encountered Chinese characters that they did not know how to pronounce, they skipped these characters intentionally and said "I don't know", "something that I could not remember", etc.

Substitution in Chinese. The second most frequent errors were substitution errors. This type of error can be divided into two types: substitution in Chinese and substitution in English. The substitution in Chinese happened when the participants misrecognized Chinese characters in the texts. The substitutions in Chinese errors included three types: visual error, meaning error, and homograph error.

Substitution in Chinese - Visual. Most of the substitution in Chinese errors were visual errors with meaning change. They were caused by the visual similarity between the two characters (i.e., the character in the text and the substituted character). The participants stated they made this type of error because many Chinese characters were similar in shape and were difficult for them to recognize and differentiate correctly. They also indicated they tried to decode each character by using all of their prior knowledge of other visually similar characters in order to "sound out" unfamiliar characters during reading, but could not integrate the meaning of the characters or maintain syntactic correctness in context.

There are several situations related to the structure of Chinese characters that affect translating them. First, when characters share the same part, readers make errors. For example, when one reader read the following sentence, “准备申请大学的材料也花了很多时间/I spent a lot of time to prepare college admission materials ” he read “准/ zhǔn” as “难/ nán”, because the two Chinese characters share the same part. They are similar visually for the reader, which made it difficult to distinguish the two different characters. Second, when the shapes of the characters are similar, readers often make oral reading errors as well. For example, several readers read “上午/morning” as “上年/not a word”, because “午” and “年” are very similar in shape, but different in meaning. Third, when two characters have the same parts, but the position is different, error can occur as well. For example, one student read the sentence, “下午我陪你去参观/ I will accompany you to visit”, instead using “陪/accompany” as “部/part”. The two characters have same parts “阝” and “音”, but the position of the two separate character parts are opposite. Table 8 shows representative examples of the visual errors in the three character only texts.

Table 8

Examples of Substitutions in Chinese-Visual Error

Examples	Error Analysis
上**午**/morning →上**年**	午 is similar to 年 visually
下**午**/afternoon →上**年**	午 is similar to 年 visually
参**观**学校 /visit school →参**现**学校	观 is similar to 现 visually

科学**实**验楼/science lab→科学**买**验楼	实 is similar to 买 visually
下午我**陪**你去参观/ I will accompany you to visit→下午我**部**你去参观	陪 is similar to 部 visually

Substitution in Chinese - Meaning. Another type of substitution in Chinese errors included meaning errors. This type of substitution error was not so common compared to visual errors. The meaning errors did not change meaning in context. They occurred when readers used a word with similar meaning to replace the word in the text, for example, one reader read "上大学以前去中国旅游两个星期。" He used the word "旅行" to replace "旅游", but the meaning of the two words are basically the same, and it did not change the meaning of the sentence. The participants made some plausible predictions and expectations in meaning when reading the text, but these errors were not very frequent, and only made by some fluent readers.

Substitution in Chinese - Homograph. Pronunciation errors occurred in reading Chinese character only texts, but they did not appear very frequently. Chinese homographs are Chinese characters that have multiple pronunciations and each pronunciation has a different meaning. For example, the character "都" could be read as "dōu/all, both" or "dū" in "首都/ capital". The different pronunciations represent different meanings. When the participants read with wrong pronunciation of the character in the text, they misunderstood the meaning of the word that had the character. This type of substitution occurred, but it only happened with one participant.

Substitution in English. Substitution in English also occurred while reading the Chinese character texts. It happened when the readers knew the meaning of Chinese characters but could not pronounce them. They described their general or exact meanings using English words.

Substitution in English - Exact meaning. The exact substitution errors occurred when the participants only recognized Chinese characters and words and their corresponding words in English. They were able to supply corresponding English words but not the pronunciation of those words in Chinese. For example, one participant pointed to the word in characters “发件人” and said “ sender”, and saw the word in characters “收件人” and said “recipient”.

Substitution in English - General meaning. The general meaning substitutions often occurred when readers used any possible clues or their prior cultural knowledge to guess meanings from context, such as when a reader saw a common format at the beginning of an email exchange, she used the text context clues and said that “This is a name”; “It must be the recipient.” Another reader saw the characters “兵马俑”, which he had never learned before and guessed that “It must be Terracotta Army, because it is famous in Xi’an”. He used his prior knowledge about Chinese culture and made a wild guess.

Substitution in English - Homonym. Another type of substitution in English were homonym errors. Some Chinese words have multiple meanings in different contexts. When CFL learners only knew one of the multiple meanings of a word, they made homonym errors. For example, in the statement, 我今年学习非常紧张/I have a very intensive schedule for my study this semester, “紧张” has two meanings in Chinese

depending on its context. It can mean “tense, intense” or “nervous”. In this sentence, the meaning of “紧张” is intense. However, the reader substituted the word with the English word “nervous” without knowing the meaning appropriate for the context.

Association error. Association errors demonstrated CFL learners’ difficulties were related to Chinese language-specific features, especially related to Chinese character recognition and understanding vocabulary. There were two main types of association errors.

Error triggered by the same character. The participants made this type of error when they did not understand the meaning of a word or a phrase in the text and only recognized one of the characters in the word/phrase. They used the character they knew in the word to connect to a different word that they had learned before. The miscue included the same character as that in the original word. The replacement word could be a meaningful word itself and sometimes was acceptable in grammatically, but it changed the meaning of the sentence. For example, one reader read the word “左边/left side” as “旁边/beside”, because the two words shared the same character “ 边”. This error changed the meaning of the sentence “在学校大门的左边/at the left side of the school gate” “在学校大门的旁边/beside the school gate”, but it still was a correct sentence grammatically. However, this type of error was not always acceptable semantically or syntactically, depending on the context. For another example, one reader read the word “可以/ may” in the sentence “然后还(可以→所以)去看看图书馆后面的科学实验楼/then you may go to visit the science lab that is behind the library” as “所以/therefore”. So the sentence was not a meaningful sentence anymore. The

trigger character could keep the same position in a word as it was mentioned in the last two examples “左边/left side” was read as “旁边/beside”, and “可以/ may” was read as “所以/therefore”, or the trigger character could change the position in the miscue, like in this example: one reader read “教学楼 /classroom building” as “学校楼 /school building”. It was triggered by the same character “学”, but the character was in a different position in the misread word. Some examples of this type of error are reported in Table 9.

Table 9

Examples of Association Errors Triggered by the Same Character

Examples	Error Analysis
我们的(教学楼 →学校楼) 在学校大门的右边.	Read 教学楼 /classroom building as 学校楼/school building. It was triggered by the character 学.
然后还(可以→所以)去看看图书馆后面的科学实验楼	Read 可以/may as 所以/therefore. It was triggered by the character 以.
在学校大门的(左边→旁边)	Read 左边/left side as 旁边/beside. It was triggered by the character 边.
然后还可以去看看图书馆后面的(科学→化学)实验楼	Read 科学/science as 化学/ chemistry. It was triggered by the character 学.
(然后→虽然)还可以去看看图书馆后面的科学实验楼	Read 然后/then as 虽然/although. It was triggered by the character 然.
我十二点(下了课→下午课)后在教学楼门口等你	Read 下了课/after class as 下午课 /afternoon class. It was triggered by the character 下.

明天上午陪你参观我们的(学校→学习)	Read 学校 /school as 学习/study. It was triggered by the character 学.
(邮件→收件)主题	Read 邮件/email as 收件/receive an email. It was triggered by the character 件.
(明年→明天)春假	Read 明年/next year as 明天/tomorrow. It was triggered by the character 明.
我的中文老师告诉我们说(中国→中文)学生的英文水平比美国学生的中文水平高多了	Read 中国 /Chinese, name of the country as 中文/Chinese language. It was triggered by the character 中.
(河南→云南)的少林寺:	Read 河南 /Henan province as 云南 /Yunnan province. It was triggered by the character 南.
是你们在美国的(姐妹→姐姐)学校的学生	Read 姐妹/sisters as 姐姐/old sister. It was triggered by the character 姐.
(挣→省)点儿钱。	Read 挣点儿钱/earn some money as 省点儿钱/ save some money. It was triggered by the characters 点儿钱.
发 (件→信) 日期	Read 发件/send an email as 发信/send a letter. It was triggered by the character 发.
好久没跟你(联系→关系)了	Read 联系/contact as 关系/relation. It was triggered by the character 系.
另外准备申请大学的(材料→饮料)也花了很多时间	Read 材料 /materials as 饮料 /beverage. It was triggered by the character 料.
上大学以前去中国旅游两个(星期 →学期)	Read 星期/week as 学期/semester. It was triggered by the character 期.
花了很多(时间→时候)	Read 时间/time as 时候/when. It was triggered by the character 时.

Error based on a compound word or a phrase. This type of error appeared when the CFL learners remembered a compound word or a phrase as a whole without understanding each character as a meaning unit in the word and misrecognized one character as another. Most of the misread words were not meaningful words anymore. For example, there were three participants who read "笔友/pen pal" as "毛友", which was not a meaningful word. The participants said they felt they made the mistake because they learned the word "毛笔/brush pen" before and mixed up the two characters in the word. In some special contexts, the miscue could be a meaningful word, but that was limited to a proper noun (e.g., name of a person or place). For example, one reader, Alex, read the name of an email recipient "丽丽" as "美美", because he knew the word "美丽/beauty" and remembered the two characters incorrectly in the word. However, "美美" happened to be an acceptable name for girls/ladies in Chinese. Examples of this type of error are reported in Table 10.

Table 10

Examples of Association Errors Based on a Compound Word/Phrase

Examples	Error Analysis
主(题→问)	Read 题 as 问. 问题 is a word that means question.
然后还可以去看看图书馆后(后→以)面的科学实验楼.	Read 后 as 以. 以后 is a word that means later.
可是我下午的(课→功)临时改到上午了.	下午的课→下午的功：read 课 as 功. 功课 is a word that means homework.
亲爱的(笔→毛)友	Read 笔 as 毛. 毛笔 is a word that means brush pen.
收件人：(丽丽 → 莎莎)	Read 丽 as 莎. 丽莎 is a common name

	that the student learned before.
收件人：(丽丽→美美)	Read 丽 as 美. 美丽 is a word that means beautiful.
你上次来(信→封)说你申请了五所大学	Read 信 as 封. 一封信 is a word that means a letter.

In addition to the two main types of association errors, there are other association errors, such as the error triggered by a visually similar character. When the readers encountered Chinese characters they could not recognize or read, they tried to use their prior knowledge of other visually similar characters to make wild guesses without making any meaningful connections. For example, when the reader could not read “成功/ success”, she guessed that it might be a word that she learned before, which was “城市/ city”. However, it was obvious that the guessed word was not meaningful in the context.

*Antonyms***.** The antonym errors in the association category appeared when CFL learners misremembered some two-character compound words with the same structure and opposite meanings, such as one reader read “以前/ before” as “以后/ after”, and another reader read “上午/ morning” as “下午/ afternoon”.

Boundary error. Boundary errors were also found when the participants read the Chinese character only texts. This type of error occurs because the Chinese language does not have spaces between characters that indicate word boundaries. There were two circumstances under which the readers made boundary errors. First, when the readers encountered new words in reading, they made wrong judgments on word boundaries. For example, one reader read the sentence “本来 - 想- 明天上午陪你参观我们的学

校 / Originally, I was planning to accompany you to visit my school" as "本- 来想-明天上午陪你参观我们的学校," "本来" is a word which means "originally", but the reader could only pronounced the characters one by one and could not figure out "本来" was a word and combined "来" and "想" together. As a result, the mistake occurred. Second, when readers were not familiar with some Chinese grammar structures and sentence patterns, they also made boundary errors. For example, one reader read the sentence "我十二点下了课后- 在- 教学楼门口等你。/I will wait for you at the gate of the classroom building" as "我十二点下了课- 后在- 教学楼门口等你". He made the wrong judgments on segmenting word boundaries by misunderstanding two grammar structures. In this sentence, "下了课后" means "after the class", and "在教学楼门口" means "at the gate of classroom building".

***Self-correction*.** Some students self-corrected when reading the Chinese character version of the texts. Although they were not reading errors, they showed the attempts and efforts often used by CFL readers to organize characters into words by judging word boundaries and recognizing grammar structures. For example, when Andrew, a good reader, read the sentence, "你可以先去看/一下我们的图书馆 /You may first go to have a look at our library", he first separated "看" and "一下". After he read the next few words in the sentence, he realized that "看一下" means "have a look", and also the verb "+ 一下" is a special grammatical structure, which indicates a brief action. As a result, he self-corrected and reread the sentence with the right word combination as "你可以先去/看一下/我们的图书馆." As another example, Alex initially incorrectly segmented the following sentence: "然后还可以去看看图书馆后/

面的科学实验楼." Later realizing that "后面" was a word that means "behind", he self-corrected and read "然后还可以去看看/图书馆/后面/的科学实验楼 / Afterward, you can have a look in the library that is behind the science lab building." Self-correcting behaviors were mostly demonstrated by good readers.

Overall, the amount and frequency of various oral errors and self-corrections that appeared in the reading of Chinese character only texts indicated multiple oral reading behaviors of CFL learners. Among the three different text conditions, students made the greatest number of errors in both number and error type when they read Chinese character only texts.

Reading behaviors related to pinyin only texts. Table 11 provides the types and frequency of oral reading errors the participants made when reading Chinese pinyin only texts. This table includes two categories of errors. The oral reading behaviors identified include boundary errors, pronunciation errors, and self-corrections. The largest number of errors made by the participants when they read pinyin only texts were boundary errors. The other type of error made by participants was the pronunciation error. Table 12 displays the total number of errors by error type in the pinyin only texts. Table 13 presents the mean error rate, oral accuracy rate, and self-correction rate in the pinyin only texts.

Table 11

Types and Frequency of Oral Reading Errors in Pinyin Only Texts

Types of Oral Reading Errors		Article A	Article B	Article C
Boundary error	Single word boundary	15	20	25

	Phrase boundary	2	4	5
	Sentence structure boundary	5	5	6
Pronunciation error	with meaning change	2	5	6
	without meaning change	0	2	0

Table 12

Total Number of Errors by Error Type in Pinyin Only Texts

Types of oral reading errors	Article A	Article B	Article C	Total
Boundary error	20	29	36	85
Pronunciation errors	2	7	6	15
Total	22	36	42	

Table 13

Mean Error Rate, Oral Accurate Rate & Self-correction Rate in Pinyin Only Texts

	Total number of running syllables	Number in sample	Mean error rate	Mean oral reading accuracy rate	Mean self-correction rate
Article A	161	7	1: 51.2	98%	1: 51.2
Article B	211	7	1: 41.0	97.6%	1: 41.0
Article C	167	7	1: 27.8	96.4%	1: 27.8

Participants made a total of 17 self-corrections for the pinyin only texts: 9 self-corrections for article A, 5 for article B, and 3 for article C.

***Word boundary errors*.** The pinyin only texts were presented to the readers without word boundaries in order to be consistent with the Chinese character versions of the texts. The participants showed different oral reading behaviors when they read the pinyin only version of the texts. Most of the oral reading errors for the pinyin only texts were related to incorrect identification of word boundaries. There were 20 word boundary errors for Article A, 29 for Article B, and 36 for Article C.

In comparison to the Chinese character only texts, a greater number of word boundary errors occurred when the participants read the pinyin only texts. The readers could pronounce the syllables in the texts with the help of pinyin, but had more difficulty identifying words and knowing their meanings without the support of Chinese characters.

The word boundary errors are categorized by the following subtypes.

Single word boundary error. When the participants encountered new words they had not learned, they made incorrect pauses between the two syllables in one word, such as: "shǒu xiān / first", "jìn kuài / as soon as possible" and "zǎo rì / early" etc. Each of these two syllable words represents one meaning unit, but the readers segmented the words into two separated syllables, clearly showing a lack of understanding the meaning of the word.

Phrase boundary errors. When the participants encountered some proper nouns or fixed phrases, such as names of buildings or places, even if they were familiar with some of the syllables in the phrases, they could not integrate them into meaningful words. For example, "jiě mèi xué xiào /sister schools", a participant knew the word "jiě mèi /sister" and "xué xiào /school", but she could not figure out when the two words

were combined, they formed a word with a different meaning. This was especially frequent when the words were related to cultural knowledge, such as the name of a place or a famous landmark in China, such as “shào lín sì /Shaolin temple” and “He Nan/the He Nan Province”, which indicated she did not have relevant background knowledge and therefore could not identify these word boundaries correctly.

Sentence structure error. With Chinese specific sentence structures, such as “Verb + Complements”, the participants experienced more difficulty understanding the meaning of complicated sentences when reading pinyin only texts without seeing the characters. For example, one reader read the sentence, “Zuó tiān / gāng gāng / bǎ / shēn qǐng xìn / jì chū qù / Yesterday, I just sent out the application letter” as “Zuó tiān / gāng gāng / bǎ shēn qǐng / xìn jì / chū qù.” She incorrectly segmented the unique “ba” sentence pattern (ba + objective + verb + complement) in Chinese without understanding the meaning of the sentence.

Pronunciation error with meaning change. There were more pronunciation errors in pinyin only texts, especially those that changed the meaning. Pronunciation accuracy became more important for the participants when they read the pinyin version of the texts without a reference in the form of the Chinese characters. Pronunciation errors occurred under two circumstances.

The first circumstance in which the errors occurred was when two words had similar pronunciations in pinyin. For example, when the readers read the sentence, “wǒ xiān xiū xí jǐ tiān /I will take it easy for a few days”, the pronunciation of “xiū xí /rest” is similar to “xué xí /study” or “shí xí/ intern” for English speakers, so they misunderstood the meaning. They pointed out in the interviews that they would not

have made such errors if they could have seen the Chinese characters “休息” for xiū xí /rest, “学习” for “xué xí /study”, and “实习” for “shí xí /intern”, because the characters are very different in shape. Without seeing the characters, the pronunciations of all those words are similar.

The second circumstance in which the errors occurred was when the words in the pinyin form contained difficult sounds. Some particularly difficult sounds caused more frequent errors, such as “shàng wǔ /morning”, and “xià wǔ / in the afternoon.” During the interviews, 10 participants reflected that “shàng” and “xià” were difficult to differentiate for them, but it would have been much easier if they could have seen the characters “上， for shàng / up and before” and “下 for xià / down and after.”

Pronunciation error without meaning change. Pronunciation errors that did not affect meaning were present, but not significant. They were limited to some sounds in Chinese that are difficult to pronounce. Even when the participants could not pronounce these sounds accurately, it did not affect their understanding of the meaning or change the meaning.

Self-correction. Self-corrections occurred more often when reading pinyin only the texts, as a reader commented, “It’s harder to go through the words, because it’s difficult to tell which word goes together without characters.” This caused the readers to make more attempts when reading pinyin only texts.

In summary, the participants focused on pronunciation accuracy when they read the pinyin only texts. It was hard for them to comprehend the meaning without seeing the characters. Some readers described that reading the pinyin version of the texts was more similar to listening to Chinese texts being read out loud when compared to reading

character only texts. The participants commented that the pinyin version of the texts were the most difficult for them to comprehend without the support of the visual cues provided by the Chinese characters.

Reading behaviors related to Chinese character with pinyin texts. The reading behaviors used when CFL learners read the Chinese character with pinyin texts included word boundary errors and pronunciation errors and their related subcategories. The categories and subcategories were consistent with the ones made by the participants when they read pinyin only texts. Table 14 provides the types and frequency of oral reading errors for Chinese character with pinyin texts. Table 15 displays the total number of errors by error type in Chinese character with pinyin texts. The mean error rate, oral accuracy rate, and self-correction rate for the Chinese character with pinyin texts are presented in Table 16.

Table 14

Types and Frequency of Oral Reading Errors in Chinese Character with Pinyin Texts

Types of Oral Reading Errors		Article A	Article B	Article C
Boundary error	Single word boundary	12	10	10
	Phrase boundary	2	1	2
	Sentence structure boundary	2	2	3
Pronunciation error	with meaning change	3	3	1
	without meaning change	3	0	1

Table 15

Total Number of Errors by Error Type in Chinese Character with Pinyin Texts

Types of oral reading errors	Article A	Article B	Article C	Total
Boundary error	16	13	15	44
Pronunciation errors	6	3	2	11
Total	22	16	17	

Table 16

Mean Error Rate, Oral Accurate Rate, & Self-correction Rate in Character with Pinyin Version

	Total number of running syllables	Number of participants	Mean error rate	Mean oral reading accuracy rate	Mean self-correction rate
Article A	161	7	1: 51.2	98%	1: 225.4
Article B	211	7	1: 92.3	99%	1: 164.1
Article C	167	7	1: 68.8	99%	1: 292.0

Participants made a total of 18 self-correction errors for the Chinese character with pinyin texts: 5 self-corrections for article A, 9 for article B, and 4 for article C.

Boundary error. The types of boundary errors in oral reading of the Chinese character with pinyin texts were the same as those made with the pinyin only version of the texts. They were single word boundary errors, phrase boundary errors, and sentence structure errors. The boundary errors appeared under the following circumstances in the character with pinyin texts.

In the first circumstance, most of the single word boundary errors appeared when the participants were able to read the pinyin, but could not recognize the characters underneath it. For example, several readers separated the word “材料 / materials” into two different isolated syllables “cái and liào ”. They said that they relied

on the pinyin, because they could not recognize the two characters under the pinyin, and did not realize the two characters formed a word. The Chinese characters underneath the pinyin provided no reference or help for the readers when they could not recognize the characters.

In the second circumstance, as native English language speakers, the participants naturally attended to pinyin, even when Chinese characters were provided under pinyin in this version of texts. Fifteen of the 21 participants reflected that pinyin distracted their attention from reading the Chinese characters and from understanding the meaning correctly based on the right sentence structure. For example, when one participant read the sentence, "都是哪些大学/what are the universities?" he read the pinyin as "dōu shì nǎ xiē de/ xué". The reader read "dà" as "de" and misunderstood the sentence structure. "大学, dà xué / University" is a common word with characters that most intermediate-level readers would be familiar with. The reader reviewed the reading error after he read the text and said that he would not have made such a mistake if he had read the characters instead of pinyin for the text. However, as an English native speaker, he chose to read the pinyin naturally whenever they were used in the texts.

Pronunciation error. The same two subtypes of pronunciation errors were made when the participants read character with pinyin texts as those in pinyin only texts.

Pronunciation errors with meaning change. The number of total pronunciation errors was similar to those for the pinyin only texts. The errors with meaning change in pronunciation were also similar to those for the pinyin only version. For example, a participant misread "xiū xi /rest" as "xué xí /study". Although the characters for "休息/

rest" are not similar to "学习 / study" visually, the pinyin for both words is very similar. The participant only read pinyin and did not pay attention to the characters.

Pronunciation errors without meaning change. This type of error also occurred when the participants only read the pinyin. For example, one reader read "lǚ xíng" as "lǔ xíng", because there is no "ǔ" sound in English. While "lǚ xíng" means travel, "lǔ xíng" is not a word. This type of pronunciation error was common for the participants in their oral reading, but it did not affect their understanding of the meaning.

Self-correction. Self-corrections appeared similarly to those that occurred for the pinyin version of the texts. Although Chinese characters provided references to meaning in this version of the texts, quite often the readers initially pronounced each syllable based on the pinyin. Once they read more words and got additional information from the characters in the context, they did self-corrections. For example, one reader first read the sentence, "我住在美国……/I live in America.", when he moved on to read more words in the sentence, he self-corrected and read "我住在美国的首都。 / I live in the capital of the United States."

In general, the Chinese character with pinyin version of the texts provided both pronunciation and character references for the participants when reading. During the retrospective conversation about the miscues they made, they mentioned that when they read this version of the texts, they switched back and forth between pinyin and characters. Although pinyin provided pronunciation clues for the characters and it made them feel more confident in reading the text aloud, many of them still thought they were unable to recognize words, know the meanings, and understand the sentence structures.

Findings from Interview Data

I conducted interviews to further understand CFL readers' reading strategies and behaviors. The results from the analysis of the interview transcripts revealed the following themes.

Most and least favorite text version. Fifteen of the 21 participants chose Chinese characters with pinyin as their favorite text version. They thought pinyin and Chinese characters in this text version complemented each other, which was very helpful for them to read orally and understand the texts.

One participant, Ana, said, "I like the Chinese text marked by pinyin, when I don't know the characters, I read pinyin. The text without pinyin is more challenging and beneficial. They are complementary." Johnson also said, "I like pinyin. It gives correct tones. Tones are important. It tells meaning." Kevin said, "Putting pinyin and characters next to each other are helpful, because pinyin can let you know how the language is spoken, and it helps students have anticipation in reading. It's important in reading, even for native speakers." Ray made the comment, "For more advanced reading texts with many unfamiliar Chinese characters, I like the version of Chinese with pinyin. I feel more comfortable with reading without pinyin if I know the characters." Jessica said, "If there is no character, I don't know what I am saying. If I have only characters, I don't know how to say it."

However, six of the 21 participants considered the character only version as their favorite text version. As Kevin commented, "When a character has pinyin above it, I always worry about if I read it right and can't focus on meaning." Steve also made a similar comment, "If you put pinyin with characters, I naturally look at pinyin, it

prevents me from reading Chinese characters." Jennifer said, "You have to know the words, if you don't know pinyin's meaning, you don't know the meaning." Ray pointed out, "Pinyin is helpful to pronounce the characters, but it is not helpful to understand meaning." Lynn also commented, "It's nice with pinyin, but as an English speaker, I will focus on pinyin. I don't want to depend on pinyin, if I read characters, I can find meaning faster."

All of the participants thought that the pinyin only text was most difficult and their least favorite text version. In order to control for additional variables, the pinyin only version of the texts used in this study was unlike the usual pinyin version of texts, which have marked word boundaries. There were no spaces between words in the texts. As a result, the participants found that pinyin only texts made it difficult for them to find and pair words.

The participants' opinions about the pinyin only version could be summarized as follows. First, pinyin was not helpful for understanding meaning. William said, "I understand the meaning of words by reading characters. I read pinyin but could not get meaning." Second, Chinese is a tonal language. Tone accuracy becomes more important when a text does not contain Chinese characters. As Tom pointed out, "Pinyin is difficult to find meaning. Chinese has tones. It's hard to know meaning without characters." Third, word boundary is more difficult to identify without the help of characters in a text. Fifteen of 21 participants mentioned pinyin only texts made identifying word boundaries more difficult.

Oral reading and silent reading. There were three different types of answers identified through the analysis of the interview transcripts. First, some participants,

especially more proficient readers in spoken Chinese, stated that they always verbalized words either in their head or out loud. For example, Kyle said, “I usually sound out the words. It’s very helpful.” Jessica also said, “I say characters and recall pronunciations. Sometimes, I have to say a word a couple times until I know the meaning.” Another reader, David said, “I have to say it aloud in my mind when I read.”

Second, other readers reported they would read the characters out loud, but not all of the time. Kathy mentioned, “I say them in my head sometimes. Some I saw them to get meaning, because I never heard how they were spoken.” Another reader, Jesse, said, “Some new words I try to read out loud; for some old words I learned, I don’t have to read out, I know the meaning.” Emily had a similar opinion, “I can understand by looking at them, but some words, I say them in my mind.”

Third, the participants with low oral proficiency levels reported that they preferred to get meaning by looking at characters instead of sounding out words. As Johnson said, “I don’t sound out. I understand the text by looking at characters. I don’t think sounding out helps me understand the meaning. It’s only helpful to recognize characters.’’ Jim said, “If I know the characters, they come out in English, like if I see ‘我’, it comes out as ‘I’, and I translate it.” Mary also made a similar comment, “I can understand the text by looking at it if I know the words. The English meaning comes to me from the characters.”

Most difficult aspects of Chinese reading. The most difficult aspects of Chinese reading could be summarized follows:

- A lot of new characters and too many new words that the readers did not know.

- The characters in different contexts had different meanings that readers could not understand.
- Grammar structures and sentence patterns that the readers did not understand.
- Subject matter in texts that was hard to handle without having enough background knowledge, such as newspaper articles that covered many aspects of peoples' lives or those that used special terms, names, and places. Some specific subjects, such as research articles, and content of the Chinese articles were difficult or unfamiliar for readers to read.
- Chinese ways of thinking that were often different from American ways.
- Unfamiliar text structure, including multi-paragraph narrative stories, was often difficult to understand.

Main concerns about Chinese reading. The main concerns when the participants read Chinese texts were difficulty with character recognition, lack of vocabulary knowledge (word meaning), lack of understanding of sentence structures, and difficulty with text comprehension. For example, Colin said, "The difficult thing is if I always have some characters that I don't know the meaning. I find characters have different meanings and pronunciations in different contexts." David also said, "My main concern is new characters. It takes me a long time to figure out their meaning. I translate each character and I still don't know meaning." Jennifer mentioned, "When I don't know the words, I don't know the meaning of the whole sentence." Ana made a similar comment, "If you don't know one word, you may miss meaning of the whole text." Brittany commented, "The grammar is difficult. I don't understand how it

organizes words." Peter shared a similar opinion, "My concern is that I have some sentences I am not familiar with. I am not sure what it exactly means."

Strategies for Chinese character recognition. The most commonly used strategy by the participants was to use context clues. Eric said, "I first skip and isolate the characters that I don't recognize and keep on reading. I then go back and forth to find clues and try to figure out meaning from context." His statement is representative of those made by other participants. Clearly, the readers understood the importance of using context to help them identify unknown characters and words.

Another strategy that the participants used most often was to look up characters and words in a dictionary. The participants preferred to use an online Chinese dictionary with an app downloaded to their cell phones. If they were allowed to use a dictionary, when the readers encountered characters that they didn't recognize, they either tried to look up the character by typing pinyin or using handwriting on the touch screens of their electronic devices. They usually could find the pronunciation and multiple meanings of a character, but could not always identify which meaning fit in a specific context.

When they could not figure out the meaning by themselves either through using context or looking it up, the strategy that the participants used next was to ask a teacher or peers to explain the meaning to them. However, most of the readers still preferred to work out the meaning themselves using clues provided by the teacher or other native speakers, instead of receiving the answer directly.

Self-efficacy. The participants all regarded themselves as intermediate-level readers. They stressed that they needed help in their reading. The reading materials they

could read were limited to textbooks and class reading material their teachers provided in class. They could not read other authentic Chinese written materials due to limited language knowledge. They also indicated that they read Chinese and English differently. When they read Chinese, it was much slower than reading English, their native language, due to a lack of enough Chinese language knowledge. They also believed that their ability to read Chinese could be improved and brought closer to their English reading skills when they have better Chinese language knowledge, especially when they can recognize enough Chinese characters. Moreover, most of the participants felt that strategies used to improve their English reading skills could be used to read Chinese texts, such as using context clues, reading more materials, and mastering language knowledge accurately.

Question 2: The Impacts of the Three Different Text Conditions on CFL Learners' Reading Comprehension

This section provides answers to research Question 2: How do the three different text conditions impact CFL learners' reading comprehension? Table 17 reports the mean comprehension accuracy rate for each article in the Chinese character only text conditions. Table 18 reports the mean comprehension accuracy rate for each article in the pinyin only text condition. Table 19 reports the mean comprehension accuracy rate for each article in the Chinese character with pinyin text condition. Also reported is the mean comprehension accuracy rate for all three articles in each text condition.

Table 17

The Comprehension Rate and Oral Reading Accuracy Rate in Chinese Character Only Texts

Chinese character only texts	Article A	Article B	Article C	Mean comprehension accuracy and oral reading accuracy
Comprehension accuracy rate	60.70%	60%	78.60%	66.40%
Oral reading accuracy rate	78.70%	86.7%	78.3%	81.2%

Table 18

The Comprehension Rate and Oral Reading Accuracy Rate in Pinyin Only Texts

Pinyin only version	Article A	Article B	Article C	Mean comprehension accuracy and oral reading accuracy
Comprehension accuracy rate	60.70%	61.90%	71.40%	64.70%
Oral reading accuracy rate	98%	97.6%	96.4%	97.3%

Table 19

The Comprehension Rate and Oral Reading Accuracy Rate in Character with Pinyin Texts

Chinese character with pinyin version	Article A	Article B	Article C	Mean comprehension accuracy and oral reading accuracy
Comprehension accuracy rate	67.90%	85.80%	71.40%	75%
Oral reading accuracy rate	98%	99%	99%	98.7%

In general, compared with the other two text conditions, the Chinese character with pinyin version of the three texts had the highest mean comprehension accuracy rate

(75%). The mean comprehension accuracy rate for the Chinese character only version texts was 66.40%, and the lowest rate was for the pinyin only texts (64.70%).

More specifically, for articles A and B, the results suggested that the participants had the highest reading comprehension accuracy rate when they read the Chinese character with pinyin texts. For article C, the pattern was not as consistent, because the participants performed best in comprehension when they read the Chinese character only version of the texts. Nevertheless, their comprehension was still better than when they read the pinyin only texts.

CHAPTER 5: DISCUSSION

Chapter 5 discusses the study's findings regarding oral reading behaviors, strategies, and comprehension of American college intermediate level CFL learners. Also discussed are findings related to text factors, reader factors, and their impact on CFL reading. The challenges of Chinese reading are identified. The study's limitations, its educational implications, and directions for future research are also discussed in this chapter.

Interactive Nature of CFL Reading

The results suggest CFL reading is an interactive process (Rumelhart, 1977, 1994). While reading Chinese texts, the participants activated multiple processors and engaged in simultaneous processing of syntactic information (knowledge of Chinese grammar), semantic information (knowledge of text development and meaning construction), orthographic information (knowledge of Chinese characters and/or pinyin), and lexical information (knowledge of word meaning).

In particular, the findings support the Interactive-Compensatory Model (Stanovich, 2000) and its application in Chinese reading. This is clearly demonstrated when the participants read the Chinese character with pinyin version of texts. When all the processors worked together smoothly, the participants were able to decode most characters in a text and construct meaning about the text successfully. They would simply move on with oral reading. When they had difficulty recognizing the characters, they automatically looked to the pinyin for help or used the context information to help them figure out the characters or the meaning of the texts.

Text Factors

Different Text Conditions

This study reveals unique findings regarding different text conditions, also known as different writing systems, on oral reading and comprehension of CFL college intermediate level students. It adopts three different versions of Chinese texts: Chinese character only, pinyin only, and Chinese character with pinyin. The character version of texts uses Chinese characters without word boundaries, and this typical practice conforms to our knowledge of authentic Chinese writing where no space is added between two words.

The pinyin only version of Chinese texts typically has space between words. This is used to help young CFL learners identify words in their native language and quickly map them onto their spoken language.

Pinyin texts are also commonly used in CFL teaching to help CFL students read Chinese characters when they have not mastered enough characters. Usually, there is space between words represented in pinyin only texts. This method provides additional support for CFL readers, because the boundaries help CFL readers decipher meaning units, which could be challenging without providing word boundaries. However, in order to obtain better understanding of how different text conditions impact decoding and comprehension, a space is used between each pinyin syllable instead of between words in this study. This method helps to illustrate which students have high language proficiency or low proficiency.

Some textbook publishers publish the Chinese character only texts on one side of the page and place pinyin only texts on the other side of a page. This approach was not used in this study with the character with pinyin version of the texts, because a prior

study suggested most readers would only read the pinyin version of the text without reading the Chinese character text. This study used the most common way of adding pinyin notation to the characters and mark pinyin above each character.

In past Chinese reading studies, the main difficulties of reading Chinese are usually attributed to CFL readers' inability to recognize Chinese characters. Unlike alphabetic languages, Chinese characters do not directly indicate their sounds. It is common that CFL readers cannot recognize each character in reading nor can they "sound out" the character they do not know. Therefore, in past studies Chinese character recognition is regarded as the strongest obstacle in reading (Ke, 2012). Moreover, because CFL readers cannot sound out every character in oral reading, if only the character version text is provided, CFL readers' oral reading errors are most often character–related. In this study, three different of versions texts were provided, thereby making it possible to investigate the influence of text factors on CFL learners' oral reading and comprehension.

Chinese Character only version of texts. Many participants' second most favorite text version is the character only version. This finding reveals that Chinese characters are not viewed as totally negative. Chinese characters are positive and helpful in some way. Unlike native speakers, when CFL learners engage in Chinese reading, they usually have not acquired enough knowledge of spoken language. Reading and oral language development in Chinese are, in some ways, two different processes. On the one hand, Chinese characters make up a relatively independent writing system that does not record how the language is spoken, which requires extra work for CFL learners to master. On the other hand, Chinese characters make up a

meaning system that provides clues for CFL readers to get meaning directly from the shapes and combinations of characters in context. Characters make it possible for CFL learners to comprehend texts even if they do not speak the language fluently.

The character's role and function in Chinese reading were under-estimated in past studies. Authors regarded Chinese characters as the greatest obstacle in reading and proposed using pinyin to simplify Chinese reading. This study suggests Chinese characters play a more positive role for CFL readers in Chinese reading, especially for text comprehension. Reading comprehension becomes very difficult when the participants read the pinyin only version of texts.

The character only version comprehension has a better average accuracy rate of 66.4% compared to 64.7% in the pinyin only version. This indicates that knowing the sounds of the words does not necessarily lead to better text comprehension.

Pinyin only version of texts. The most difficult version is the pinyin only text. Being foreign language readers, the participants found that the pinyin only version was extremely difficult for them without the support of Chinese characters.

First, the comprehension of texts becomes most difficult without the presence of characters. This is because these intermediate level CFL readers do not have enough language knowledge upon which to fall back. They relied more heavily on their knowledge of written characters/words to construct meaning about the texts. Chinese characters are heavily morphemic—they are units containing meaning, while pinyin is just a tool to help them recognize the sound of the characters rather than a full alternative alphabetic system for written Chinese. One sound with the same tone could correspond to multiple characters with different meanings. So when there is no

character in the texts, the visual stimulation is not functional anymore and comprehension becomes more difficult.

Second, pinyin only texts make Chinese texts harder for CFL readers to judge word boundaries and to figure out grammar patterns that are more complicated in Chinese. It is even more challenging when the word order in a sentence is different from English. For example, the Chinese sentence in pinyin "tú shū guǎn hòu miàn de kē xué shí yàn lóu", means "the science lab that is behind the library". The word order in this sentence in Chinese is that the modifier ("tú shū guǎn hòu miàn"/behind the libarary) is used before the modified words ("kē xué shí yàn lóu"/ science lab), which is opposite from that in English. Many readers could not figure out the two buildings' names "library and science lab" from simply reading pinyin and therefore could not identify the locations of the two buildings. This is why the pinyin only version texts contain the most boundary errors in oral reading, which contributed to difficulty in text comprehension among the participants.

Third, when there are no characters in the texts, the accuracy of pronunciation and tones become crucial. Most of the pronunciation errors affected meaning in the pinyin version. For example, the pronunciation of the word "in the morning" is "shàng wǔ" in Chinese, and "in the afternoon" is "xià wǔ". In this case, "shàng" and "xià" sound very similar for the CFL participants. As a result, several readers were confused by the pronunciations and could not tell which word is "morning" or "afternoon". However, when they saw the characters "上午 / morning" and "下午 / afternoon", they could easily distinguish the two words through the visual cues supplied in the two high frequency characters.

Fourth, pinyin versions texts make readers less cautious and less able to understand some culture specific contents in reading. For instance, a reader did not know "the Terracotta Soldier" is pronounced "bīng mǎ yǒng", yet he knew the meaning of the word when he saw it represented in Chinese characters. Pinyin texts make comprehension difficult. It is easier for CFL readers to recognize some words from their shapes instead of their sounds only when they read.

Character with pinyin version of texts. More than two thirds of the participants thought the character with pinyin version was their favorite text version. In this text version, pinyin provided pronunciation for characters and allowed the readers to connect the sounds to printed characters. In this study, when the CFL learners could recognize Chinese characters, they constructed meaning of the text automatically by reading the characters.

When they could not recognize certain Chinese characters, they sought help from and read the pinyin notations for the characters to help them retrieve the sound. The pronunciation provided by pinyin helped them tap into their language knowledge and comprehend what they read.

However, a few participants thought it was not helpful, and they were typically good CFL readers who recognized a significant number of Chinese characters. When the Chinese texts were marked with pinyin, the primary purpose of pinyin was to provide pronunciation information for characters. They commented when characters and pinyin were provided together, it distracted their attention from focusing on reading characters and gaining meaning from the characters. This is because as native English language learners, out of habit, they naturally diverted their attention to the pinyin noted

above each Chinese character whether they knew the character or not. Therefore, these readers did not select this text version as their most favorite text.

On the other hand, while pinyin assisted most participants in reading the texts aloud, it was not always helpful for poor readers who did not have sufficient language knowledge. With the help of pinyin, they could read the pinyin text out loud, but they still could not comprehend its meaning. It also made them more dependent on pinyin, which hindered their ability to comprehend the meaning of the text.

It is important to note all the participants expressed that they felt comfortable with reading Chinese character only texts without pinyin provided if they knew the characters in the texts. They believed gaining knowledge of Chinese characters is the priority of Chinese learning. Knowledge of Chinese characters instead of pinyin is required for one to be literate in Chinese.

Sentence Structures and Text Organization

This study also suggests that Chinese specific sentence structures and text organization impacted CFL readers' comprehension. The Chinese language has many unique grammar patterns. Chinese is a focus-behind language. For example, at the sentence level, the modifier is always used before the modified words. Also, there are many more meaning-behind complement-sentence patterns in Chinese than in English.

As for the organization of a text, the main meaning of a text is not always known until the reader reads the last few sentences. The content of a text could be related to several different subjects that are loosely connected. In contrast to English, in which each completed sentence must end with a period, in Chinese, several completed

sentences could be connected by using commas until the final overall meaning is expressed.

This unusual written discourse pattern has shown to be challenging for the participants, and they need to make extra effort to comprehend the text properly. More advanced readers in this study had context knowledge of sentence structures and text organization, but not the poor readers. The poor readers tend to gain meaning solely from characters and words that they recognized or from the sentences they are familiar with and could not achieve full comprehension from the text due to their insufficient knowledge of grammar structures and text organization.

Reader Factors

Readers' Active Role in Reading

The findings support the psycholinguistic model of reading (Goodman, 1967, 1996, 2004). According to this model, readers use all the available sources of information, including their language and background knowledge of language cueing systems to make predictions and hypotheses about upcoming text. There is an interaction between language and thought in reading.

The participants made multiple substitution errors. Some of the substitution errors are meaning acceptable errors. For example, when some readers read the sentence "去中国旅游两个星期／go to China to travel for two weeks", they used the word "旅行" to replace "旅游" in their oral reading, but it did not change the meaning of the sentence. This meaning acceptable error shows that more proficient CFL learners use higher-level language cueing systems to make plausible predictions in their reading.

Most of the reading errors in the protocol are omissions and made by the readers with low proficiency in Chinese. This indicates that these readers have difficulties decoding and recognizing Chinese characters and lack effective recovery strategies that may enable them to use a variety of language cueing systems to problem solve. The visual errors made by the low level readers also indicate that these readers mainly paid attention to the visual cues in their reading and therefore failed to construct meaning from what they read.

A special type of oral reading errors identified in this study is association errors. These oral reading errors are either associated with a compound word or a certain character that the CFL learners had known before. This type of error provides evidence that CFL learners draw upon their prior knowledge, but misappropriate the knowledge in their effort to decode unknown characters and words.

Self-correction occurred during oral reading of all three different versions of texts. This reveals that some CFL learners (more advanced learners in this study) are able to monitor and cross check their attempts with cues from multiple cueing systems to make self-corrections.

Reader Schema

Schema related to Chinese culture. The findings also support the schema theory (Carrell, 1983). Two types of schema are critical to text comprehension in this study. The first schema is Chinese culture schema. During the reading of Chinese texts, when the content schema was culturally Chinese specific and not a part of participant's cultural background knowledge, the comprehension of Chinese texts became difficult. In this study, article C contained special Chinese culture elements. Its content included

the Great Wall, the Imperial Palace in Beijing, the Shaolin Temple in Henan Province, the Terracotta Army in Xi'an and the panda preserve in Sichuan. The participants who had been to China before and visited these famous places all thought the text was easy for them. Even if the text had some difficult characters that they never learned before and could not read, such as 熊猫 (panda), 少林寺 (Shaolin Temple) and 兵马俑 （Terracotta Soldiers), with the help of pinyin to connect to the pronunciations to the words, they could figure out meaning from the context and had good comprehension of the text. In contrast, other participants, who did not have previous study abroad experience in China or have sufficient Chinese cultural background knowledge reported that there were too many special proper nouns and terms in the text that prevented them from understanding the meaning. Even when they could sound the Chinese characters out with the help of pinyin, they still could not access the language and activate related cultural schema to use to comprehend the text.

Schema related to Chinese language. Besides the schema of cultural knowledge, the other type of schema is Chinese language-specific. Language proficiency is required for CFL readers to activate relevant schemata and gain comprehension. As English-speaking participants in this study, participants had several difficulties activating their Chinese language-related schema in the reading process. The first difficulty is related to the Chinese orthography. The character based writing system in Chinese is very different from an alphabetic language. When the participants encountered some characters that they had not learned before and could not find any clues from the context, they had to skip unfamiliar characters and made many omission errors. The other difficulty is related to unique sentence structures in Chinese. For

example, a modifier usually precedes the modified word, even when the modifier is a verb phrase or a clause. In this study, article B has many of these structures, such as “图书馆后面的科学试验楼/the science lab that is behind the library.” According to the Chinese word order, it is “the library backsides science lab”. Readers who could not understand the word order in the sentence and chose to use their English grammar knowledge would misunderstand the location of the two buildings. The third difficulty is the special discourse of Chinese texts. As mentioned above in the section on text factors, text organization and discourse patterns in Chinese texts are unique. Without sufficient knowledge of text organization, the CFL readers could not achieve comprehension.

CFL Reader Strategies

This study reveals several reading strategies that intermediate level college CFL learners use when they process Chinese texts.

Chinese character recognition is one of the greatest difficulties in Chinese reading for CFL learners. When the participants encountered characters they did not recognize, one commonly used strategy was the association strategy. They used clues from the characters they had learned before to identify unknown characters. For example, CFL readers tend to visually process a Chinese character as a whole and to remember the character in a word combination or a context in which they often appear. That tendency particularly explains the phenomenon where more than one reader made the error of reading “主题 / topic” as “主问”, which is not a word. Because “问题/question” is a word that they learned before, they remembered the wrong character even though the two characters are significantly different in shape. The participants

made many opposite-meaning word mistakes for the same reason, such as “以前 /before” and “以后 / after” and “上午 / morning” and “下午 / afternoon”.

As beginning or intermediate level CFL readers, when the participants in this study remembered characters, they were more likely to remember them as a visual unit and memorize their English meaning by translation. Even though a great percentage of Chinese characters are phonetic and semantic compound characters and provide clues for meaning and pronunciation, CFL readers seldom remember a character by dividing it into its semantic element (i.e., radical) to infer its meaning and its phonetic component to infer its pronunciation.

Using context clues to obtain meaning is another important strategy that CFL readers adopted in this study. All participants mentioned that when they encountered any character they did not know, they used context clues to try to figure out its meaning. This strategy is consistent with the strategy of using context clues in first language reading by native language users.

Looking up a character in an online dictionary or asking a person who might recognize the character are other strategies identified by participants to help them problem solve unknown characters.

Omission was also a strategy frequently used by CFL readers. However, it is not a productive one. It suggests a need for the CFL instructor to provide them with effective strategies that can help them stay engaged with the text.

Major Challenges of Chinese Reading

This study confirmed the greatest difficulty in reading Chinese was learning and mastering the meaning of Chinese characters. The challenges for CFL readers to learn characters are mostly concentrated in three areas.

The first challenge is to distinguish the shapes of Chinese characters. Many Chinese characters appear to have similar shapes to CFL readers even if they look very differently to native speaker readers. CFL readers have different strategies for remembering characters compared to native speaker readers as mentioned above. As beginning and intermediate level readers, they usually remember Chinese characters as a whole visual unit based on their English meanings and seldom recognize a character by paying attention to its phonetic and meaning elements. Because lower proficiency level CFL readers do not have effective character recognition strategies, they basically have to memorize each character in isolation. Therefore, the amount of memorization is overwhelming for CFL readers.

The second challenge is to know the different meanings of a character in different contexts. There are 2,000-3,000 commonly used Chinese characters. Most of the time one character is a morpheme unit and has multiple meanings in different context. The variety of meaning of Chinese characters makes it difficult for CFL readers to master meaning accurately.

The third challenge is to remember the pronunciation of a character. Even though some characters have phonetic elements, they are either not reliable for actual pronunciation due to the changes of pronunciation over time or are difficult for CFL readers to distinguish.

In this study, many participants reported that they read out loud or read in their head and gained meaning by processing characters visually without sounding them out when they read Chinese texts on their own. To be able to sound out a character with the help of pinyin is not always equal to knowing the character because the meaning is not connected to its sound. This finding is unique in that it provides empirical evidence to illustrate the role and function of pinyin in CFL reading. It also suggests the approach to teach the sound of a character without teaching its meaning simultaneously is not conducive to the development of Chinese reading comprehension.

The results also highlight the importance of identifying individual word meaning units through correctly inferring word boundaries. This is a difficult task. The boundary errors and self-correction attempts that CFL readers made in the study show that this special characteristic of Chinese text makes comprehension challenging and, therefore, more attention needs to be devoted to finding ways to help CFL readers correctly segment sentences into meaning units.

Implications

The findings from this study offer new insights into the reading processes and strategies employed by CFL readers under different text conditions. The findings have both research and instructional implications for CFL education. These findings can also be used to inform textbook development.

Implications for CFL Reading Research

First**,** it has been a long-held implicit assumption that Chinese characters are the major obstacles for CFL learners. It is commonly thought that the character based Chinese writing system is different from alphabetic language orthography in that it

cannot not be connected to the spoken language directly. Therefore, it is assumed to be extremely difficult and extra time and effort are needed for CFL English-speaking learners to learn how to recognize and write characters.

Popular opinion argues CFL learning and teaching could be much easier if CFL learners learned pinyin instead of Chinese characters, and it is also common to find the marking of pinyin above Chinese characters in Chinese texts based on the assumption that this can reduce the difficulty level of CFL reading.

However, this study found that the favorite version of Chinese texts for many CFL readers was the Chinese character only text. The pinyin only version was regarded as the most difficult one. The Chinese character with pinyin version was not very helpful for CFL readers when they did not have enough language knowledge to fall back upon or when they knew most of the characters in the text. The function of the Chinese characters in Chinese reading is actually underestimated. Therefore, the role of Chinese characters in Chinese reading is worthy of further study in CFL reading.

In addition, this study used character only, pinyin only, and character with pinyin versions of Chinese texts. It provided an opportunity to study the relation between spoken language and written language in CFL learning. Although the study provided evidence that having a good knowledge of Chinese language and culture can help CFL learners with character recognition and reading comprehension, it also found that CFL learners have different reading strategies and behaviors from Chinese native speakers. CFL learners may choose not to connect the language to the written words by sounding out all of the Chinese characters, but instead to sometimes gain meaning from the characters directly without retrieving their sounds. This suggests that in learning to

read in Chinese, learning sound and meaning could be a relatively independent process. It is possible for CFL learners to achieve higher levels of proficiency in reading with limited speaking and listening skills.

Moreover, this study adopted psycholinguistic and interactive model reading theories and conducted analysis of CFL reader's oral reading errors when reading different versions of texts. Analysis of oral reading errors provides rich insight into the reading processes and strategies employed by the CFL readers. Further research can continue to build upon the findings from this research and validate them with a larger sample.

Implication for Teaching Chinese as Foreign Language

The findings of this study also have strong implications for CFL learning and teaching practices.

The use of Chinese oral reading protocol. A weak area in CFL education is assessment and evaluation. The protocol developed in this study is ground breaking. It can be used as a valuable tool for assessing and analyzing CFL reader's oral reading errors. It provides a window into their reading process and strategies. It describes how a particular reader reads a text and provides a valid record of how he/she arrives at his/her decisions during Chinese reading. The analysis can also identify areas where instructors need to focus their teaching. The accuracy rate could be used to help decide the difficulty level of a Chinese text.

Teaching Chinese characters. First, the study suggests that although the teaching of character recognition is not equal to teaching Chinese reading, it is still one of the most difficult tasks in learning to read Chinese. Based on the large number of

visual errors in reading the character version of texts, it can be concluded that many Chinese characters appear similar to CFL readers. To teach CFL learners to compare and contrast visually similar characters and distinguish them should be one of the major targets and recommended practices in CFL teaching. The large number of omission errors in reading the Chinese character only texts suggests that teaching Chinese character recognition is an ongoing task in CFL reading.

In addition, the findings of the study also show that CFL readers use different strategies to learn characters, especially for beginning and intermediate level readers who preferred to memorize characters as a whole instead of analyzing their internal structures. Therefore, the method of using structural analysis to teach them to identify the phonetic components and meaning components should be considered and reformed.

Teaching Chinese culture. Although there is a consensus that background knowledge of Chinese culture is essential in CFL learning and teaching, the findings of this study suggest that readers' cultural schema play an important role for CFL reading. It is important to actively develop CFL readers' cultural schemata in order to facilitate their cultural text comprehension. In addition, Chinese cultural knowledge should be taught in conjunction with Chinese reading as a complex endeavor that integrates higher-level skills that include structure (syntax), meaning (semantics), and readers' Chinese cultural knowledge, and the lower-level skills that include character recognition, orthographic, and phonological processing.

Conclusion

This study reveals new information regarding how text factors influence oral reading behaviors and text comprehension among CFL intermediate level readers. The

study provides evidence that supports the interactive-compensatory model of Chinese reading for CFL learners. It also reveals several unique aspects of CFL reading that can be used to inform CFL teaching and learning

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APPENDIX A: PRE-READING TEXT

Read this short story

小时候，奶奶给我讲过这样一个故事：很久很久以前，没有天也没有地，整个宇宙是混混沌沌的一个大团，好像一个大皮球。有一个孩子就睡在这个球中间。他睡啊睡啊，一睡就是九万八千年。有一天孩子就睡在这个大球中间。他睡啊睡啊，一睡就是九万八千年。有一天，不知道是什么原因，这个孩子忽然醒了。他睁开眼睛一看，四周都是黑漆漆的一片，什么都看不见。他伸手摸来摸去，摸到了一把宝剑。他挥舞宝剑，把大球割破了。大球里边的那些比较轻的东西往上升，变成了天:比较重的东西往下降，变成了地。天和地就这样分开了。

他担心天和地会再合上，就站在天和地的中间，用头顶着天，用脚踩着地。天和地之间的距离越来越大，这个孩子也越长越高，越长越壮，变成了一位巨人。这位巨人就这样站着，好像一根大柱子。过了一万八千年，巨人觉得实在太累了，再也坚持不住了，于是他就倒了下去。只听到“轰”的一声，他的头发变成了树林，肩膀变成了高山，肚子变成了平原，汗水变成了大海，血液变成了湖泊，口水变成了河流，眼泪变成了雨水，嘴里呼出的气变成了风和云。这样才有了我们这个美丽的世界。

APPENDIX B: THREE DIFFERENT VERSIONS OF TEXTS

Chinese character version of texts:

Article A: Read this email:

发件人：明明

收件人：丽丽

邮件主题：最近好吗？

发件日期：2005 年 9 月 17 日

丽丽：

你好！好久没跟你联系了。最近学习忙吗？我今年学习非常紧张，另外准备申请大学的材料也花了很多时间。昨天刚刚把申请信寄出去。好在我们就要放假了。放假以后我先休息几天，然后去一个离家很近的地方打工，挣点儿钱，上大学以前去中国旅游两个星期。你上次来信说你申请了五所大学，都是哪些大学？预祝成功。

明明

1. The sender and recipient of the e-mail are

A college students
B high school students
C coworkers
D relatives

2. What is the purpose of this e-mail?

A To seek assistance in submitting an application
B To ask for advice about overseas travel
C To discuss current activities and future plans
D To wish a friend good luck in starting a new job

3. What does the sender plan to do first when vacation starts?

A Travel to China
B Return home
C Look for a job
D Take it easy for a few days

4. What do we learn from the e-mail about the recipient?

A She plans to get a full-time job.
B She does not check her e-mail every day.
C She is already on vacation.
D She is applying to college.

Article B: Read this email:

发件人：林小芳

收件人：李华

邮件主题：参观学校

发件日期：2005 年 10 月 18 日

小李：

对不起。本来想明天上午陪你参观我们的学校，可是我下午的课临时改到上午了。你明天早上来了以后，可以先去看一下我们的图书馆（在学校大门的左边），然后还可以去看看图书馆后面的科学实验楼。我们的教学楼在学校大门的右边。我十二点下了课后在教学楼门口等你。下午我陪你去参观学校的体育馆和其他地方。

明天见

小芳

1. Xiaofang apologizes because she will not be able to do which of the following tomorrow?

A Accompany Xiao Li in the morning
B Take Xiao Li to sit in on one of her classes

C Show Xiao Li around her school in the afternoon
D Meet Xiao Li after class

2. Where is the science lab located?

A To the right of the main gate
B In front of the gymnasium
C Next to the classroom building
D Behind the library

3. Xiao Li and Xiaofang will meet tomorrow in front of the

A classroom building
B library
C science lab
D gymnasium

Article C: Read this letter from a pen pal.

亲爱的笔友，

你好！

首先让我来自我介绍一下。我的中文名字叫史大卫，是你们在美国的姐妹学校的学生。老师说你住在中国的首都，我住在美国的首都。我喜欢吃中国饭，写中国字，画中国画，尤其是爱练中国武术。

我的中文老师告诉我们说中国学生的英文水平比美国学生的中文水平高多了。请你来信一定要给我介绍你学习外语的“成功秘密”。明年春假，我要跟老师去中国旅行，我真想早日看到长城、北京的故宫、河南的少林寺、四川的熊猫保护基地，特别是西安的兵马俑。

请尽快给我回信。

祝

学习进步！

史大卫

七月十六日

1. What do the writer and the recipient of the letter have in common?

A They both have sisters.
B They both live in their nation's capital.
C They are the same age.
D They will be seniors in the fall.

2. What is the writer's favorite Chinese cultural activity?

A Eating Chinese food
B Writing Chinese characters
C Painting in the traditional Chinese style
D Practicing Chinese martial arts

3. What did the writer's teacher say about Chinese students in comparison to students in the United States?

A Chinese students are more highly motivated to study English than American students are to study Chinese.
B Chinese students have more opportunities to practice English than American students have to practice Chinese.
C Chinese students' proficiency level in English is higher than American students' proficiency level in Chinese.
D Chinese students' knowledge of American culture is greater than American students' knowledge of Chinese culture.

4. What site in China is the writer most looking forward to visiting?

A The Imperial Palace in Beijing
B The Shaolin temple in Henan
C The Terracotta Army in Xi'an
D The panda preserve in Sichuan

Pinyin version of texts

Article A: Read this email:

Fā jiàn rén: Míng míng

Shōu jiàn rén: Lì lì

Yóu jiàn zhǔ tí: Zuì jìn hǎo ma?

Fā jiàn rì qí: 2005 Nián 9 yuè 17 rì

Lì lì:

Nǐ hǎo! Hǎo jiǔ méi gēn nǐ lián xì le. Zuì jìn xué xí máng ma? Wǒ jīn nián xué xí fēi cháng jǐn zhāng, lìng wài zhǔn bèi shēn qǐng dà xué de cái liào yě huā le hěn duō shí jiān. Zuó tiān gang gāng bǎ shēn qǐng xìn jì chū qù. Hǎo zài wǒ men jiù yào fang jià le. Fàng jià yǐ hòu wǒ xiān xiū xí jǐ tiān, rán hòu qù yī gè lí jiā hěn jìn de dì fāng dǎ gōng, zhēng diǎn'er qián, shàng dà xué yǐ qián qù zhōng guó lǚ yóu liǎng gè xīng qí. Nǐ shàng cì lái xìn shuō nǐ shēn qǐng le wǔ suǒ dà xué, dōu shì nǎ xiē dà xué? Yù zhù chéng gōng.

Míng míng

1. The sender and recipient of the e-mail are

A college students
B high school students
C coworkers
D relatives

2. What is the purpose of this e-mail?

A To seek assistance in submitting an application
B To ask for advice about overseas travel
C To discuss current activities and future plans
D To wish a friend good luck in starting a new job

3. What does the sender plan to do first when vacation starts?

A Travel to China
B Return home
C Look for a job
D Take it easy for a few days

4. What do we learn from the e-mail about the recipient?

A She plans to get a full-time job.
B She does not check her e-mail every day.
C She is already on vacation.
D She is applying to college.

Article B: Read this email:

Fā jiàn rén: Lín xiǎo fāng

Shōu jiàn rén: Li huá

Yóu jiàn zhǔ tí: Cān guān xué xiào

Fā jiàn rì qí:2005 Nián 10 yuè 18 rì

Xiǎo li:

Duì bù qǐ. Běn lái xiǎng míng tiān shàng wǔ péi nǐ cān guān wǒ men de xué xiào, kě shì wǒ xià wǔ de kè lín shí gǎi dào shàng wǔ le. Nǐ míng tiān zǎo shang lái le yǐ hòu, kě yǐ xiān qù kàn yī xià wǒ men de tú shū guǎn (zài xué xiào dà mén de zuǒ biān), rán hòu hái kěyǐ qù kàn kàn tú shū guǎn hòu miàn de kē xué shí yàn lóu. Wǒ men de jiào xué lóu zài xué xiào dà mén de yòu biān. Wǒ shí'èr diǎn xià le kè hòu zài jiào xué lóu mén kǒu děng nǐ. Xià wǔ wǒ péi nǐ qù cān guān xué xiào de tǐ yù guǎn hé qí tā dì fāng.

Míng tiān jiàn

Xiǎo fang

1. Xiaofang apologizes because she will not be able to do which of the following tomorrow?

A Accompany Xiao Li in the morning
B Take Xiao Li to sit in on one of her classes
C Show Xiao Li around her school in the afternoon
D Meet Xiao Li after class

2. Where is the science lab located?

A To the right of the main gate
B In front of the gymnasium
C Next to the classroom building
D Behind the library

3. Xiao Li and Xiaofang will meet tomorrow in front of the

A classroom building
B library
C science lab
D gymnasium

Article C: Read this letter from a pen pal.

Qīn ài de bǐ yǒu,

Nǐ hǎo!

Shǒu xiān ràng wǒ lái zì wǒ jiè shào yī xià. Wǒ de zhōng wén míng zì jiào shǐ dà wèi, shì nǐ men zài měi guó de jiě mèi xué xiào de xué shēng. Lǎo shī shuō nǐ zhù zài zhōng guó de shǒu dū, wǒ zhù zài měi guó de shǒu dū. Wǒ xǐ huan chī zhōng guó fàn, xiě zhōng guó zì, huà zhōng guó huà, yóu qí shì ài lián zhōng guó wǔ shù.

Wǒ de zhōng wén lǎo shī gào su wǒ men shuō zhōng guó xué shēng de yīng wén shuǐ píng bǐ měi guó xué shēng de zhōng wén shuǐ píng gāo duō le. Qǐng nǐ lái xìn yī dìng yào gěi wǒ jiè shào nǐ xué xí wài yǔ de “chéng gōng mì mì”.

Míng nián chūn jià, wǒ yào gēn lǎo shī qù zhōng guó lǚ xíng, wǒ zhēn xiǎng zǎo rì kàn dào cháng chéng, běi jīng de gù gōng, hé nán de shào lín sì, sì chuān de xióng māo bǎo hù jī dì, tè bié shì xī ān de bīng mǎ yǒng.

Qǐng jǐn kuài gěi wǒ huí xìn.

Zhù

Xué xí jìn bù!

Shǐ dà wèi

Qī yuè shí liù rì

1. What do the writer and the recipient of the letter have in common?

A They both have sisters.
B They both live in their nation's capital.
C They are the same age.
D They will be seniors in the fall.

2. What is the writer's favorite Chinese cultural activity?

A Eating Chinese food
B Writing Chinese characters
C Painting in the traditional Chinese style
D Practicing Chinese martial arts

3. What did the writer's teacher say about Chinese students in comparison to students in the United States?

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B Chinese students have more opportunities to practice English than American students have to practice Chinese.
C Chinese students' proficiency level in English is higher than American students' proficiency level in Chinese.
D Chinese students' knowledge of American culture is greater than American students' knowledge of Chinese culture.

4. What site in China is the writer most looking forward to visiting?

A The Imperial Palace in Beijing
B The Shaolin temple in Henan
C The Terracotta Army in Xi'an
D The panda preserve in Sichuan

Chinese Character with Pinyin Version of Texts

Article A: Read this email:

fā jiàn rén míng míng
发 件 人： 明 明

shōu jiàn rén l ìl ì
收 件 人：丽丽

yóu jiàn zhǔ t í zuìjìn hǎo ma
邮 件 主 题：最近 好 吗？

fā jiàn r ì qī nián yuè r ì
发 件 日 期：2005 年 9 月 17日

---

l ì l ì
丽丽：

nǐ hǎo hǎo jiǔ méi gēn nǐ lián x ìl e zuì jìn xué x í máng ma wǒ jīn nián
你 好！ 好 久 没 跟 你 联 系了。最 近 学 习 忙 吗？我 今 年

xuéx í fēi cháng jǐn zhāng lìng wài zhǔn bèi shēn qǐng dàxué de cai liào yě
学 习 非 常 紧 张 ， 另 外 准 备 申 请 大 学 的 材 料 也

huā lehěn duō shí jiān zuó tiān gāng gāng bǎ shēn qǐng xìn j ì chū qù hǎo

花 了很 多 时 间。昨 天 刚 刚 把 申 请 信寄 出 去。好

zài wǒmen jiù yào fàng jià l e fàng jià y ǐ hòu wǒ xiān xiū x ī j ǐ tiān rán

在 我 们 就 要 放 假了。 放 假以 后 我 先 休息几 天， 然

hòu qù y í gè l í jiā hěn jìn de dì fān dǎ gōng zhèng diǎn ér qián shàng dà

后 去一 个离 家 很 近的地 方 打 工， 挣 点 儿 钱， 上 大

xué y ǐ qián qù zhōng guó l ǚ yóu liǎng gè xīng qī nǐ shàng c ì lái xìn shuō nǐ

学 以 前 去 中 国旅 游 两 个 星 期。你 上 次来 信 说 你

shēn qǐng l e wǔ suǒ dà xué dōu shì nǎ xiē dà xué yù zhù chéng gōng

申 请 了 五 所 大 学， 都 是哪 些大 学？预 祝 成 功

míng míng

明 明

5. The sender and recipient of the e-mail are

A college students
B high school students
C coworkers
D relatives

6. What is the purpose of this e-mail?

A To seek assistance in submitting an application
B To ask for advice about overseas travel
C To discuss current activities and future plans
D To wish a friend good luck in starting a new job

7. What does the sender plan to do first when vacation starts?

A Travel to China
B Return home
C Look for a job
D Take it easy for a few days

8. What do we learn from the e-mail about the recipient?

A She plans to get a full-time job.
B She does not check her e-mail every day.
C She is already on vacation.
D She is applying to college.

Article B: Read this email:

fā jiàn rén lín xiǎo fāng
发 件 人： 林 小 芳

shōu jiàn rén lǐ huá
收 件 人： 李 华

yóu jiàn zhǔ tí cān guān xué xiào
邮 件 主 题： 参 观 学 校

fā jiàn rì qī nián yuè rì
发 件 日 期：2005 年 10 月 18日

---

xiǎo lǐ
小 李：

duì bu qǐ　běn lái xiǎng míng tiān shàng wǔ péi ni cān guān wǒ men de
对不起。本来想明天上午陪你参观我们的

xuéxiào　kě shì wǒ xià wǔ de kè lín shí gǎi dào shang wǔ le　nǐ míng
学校，可是我下午的课临时改到上午了。你明

tiān zǎo shang lái le yǐ hòu　kě yǐ xiān qù kàn yí xià wǒ men de tú shū
天早上来了以后，可以先去看一下我们的图书

guǎn　zài xué xiào dà mén de zuǒ bian　rán hòu hái kě yǐ qù kàn
馆（在学校大门的左边），然后还可以去看

kan tú shū guǎn hòumian de kē xué shí yàn lóu　wǒ men de jiào xué lóu
看图书馆后面的科学实验楼。我们的教学楼

zài xué xiào dà men deyòu biān　wǒ shí èr diǎn xià le kè hòu jiào xu lóu
在学校大门的右边。我十二点下了课后教学楼

mén kǒu děng nǐ　xià wǔwǒ péi nǐ qù cān guān xué xiào de tǐ yù guǎn
门口等你。下午我陪你去参观学校的体育馆

hé qí tā dì fāng
和其他地方。

míng tiān jiàn

明　天　见

xiǎo fāng

小　芳

1. Xiaofang apologizes because she will not be able to do which of the following tomorrow?

A Accompany Xiao Li in the morning
B Take Xiao Li to sit in on one of her classes
C Show Xiao Li around her school in the afternoon
D Meet Xiao Li after class

2. Where is the science lab located?

A To the right of the main gate
B In front of the gymnasium
C Next to the classroom building
D Behind the library

3. Xiao Li and Xiaofang will meet tomorrow in front of the

A classroom building
B library
C science lab
D gymnasium

Article C: Read this letter from a pen pal.

qīn ài de bǐ yǒu

亲 爱 的 笔 友，

nǐ hǎo

你 好 ！

shǒu xiān ràng wǒ lái zì wǒ jiè shào yí xià wǒ de zhōng wén míng zì jiào

首 先 让 我 来 自 我 介 绍 一 下。 我 的 中 文 名 字 叫

shǐ dà wèi shì nǐ men zài měi guó de jiě mèi xué xiao de xué shēng lǎo

史 大 卫， 是 你 们 在 美 国 的 姐 妹 学 校 的 学 生 。 老

shī shuō nǐ zhù zài zhōng guó de shǒu dū wǒ zhù zài měi guó de shǒu dū

师 说 你 住 在 中 国 的 首 都， 我 住 在 美 国 的 首 都

wǒ xǐ huan chī zhōng guó fàn xiě zhōng guó zì huà zhōng guó huà

。 我 喜 欢 吃 中 国 饭， 写 中 国 字， 画 中 国 画，

yóu qí shì ài liàn zhōng guó wǔ shù

尤 其 是 爱 练 中 国 武 术。

wǒ de zhōng wén lǎo shī gào sù wǒ men shuo zhōng guó xué shēng de yīng

我 的 中 文 老 师 告 诉 我 们 说 中 国 学 生 的 英

wénshuǐping bǐ měi guó xué shēng de zhōng wén shuǐ píng gāo duō le

文 水 平 比 美 国 学 生 的 中 文 水 平 高 多 了。

qǐng nǐ lái xìn yí dìng yào gěi wǒ jiè shào nǐ xué xí wài yǔ de chéng gōng

请 你 来 信 一 定 要 给 我 介 绍 你 学 习 外 语 的“ 成 功

mì mì míngnián chūn jià wǒ yào gēn lǎo shī qù zhōng guó lǚ xíng wǒ

秘 密”。 明 年 春 假， 我 要 跟 老 师 去 中 国 旅 行， 我

zhēn xiǎng zǎorì kàn dào cháng chéng běi jīng de gù gōng hé nán de shào

真 想 早 日 看 到 长 城 、 北 京 的 故 宫 、 河 南 的 少

lín sì sì chuān de xióng māo bǎo hù jī dì tè bié shì xī ān de bīng mǎ

林 寺、 四 川 的 熊 猫 保 护 基 地， 特 别 是 西 安 的 兵 马

yǒng

俑 。

qǐng jǐn kuài gěi wǒ huí xìn

请 尽 快 给 我 回 信 。

zhù

祝

xué xí jìn bù

学 习 进 步 !

shǐ dà wèi

史 大 卫

qī yuè shí liù rì

七 月 十 六 日

1. What do the writer and the recipient of the letter have in common?

A They both have sisters.
B They both live in their nation's capital.
C They are the same age.
D They will be seniors in the fall.

2. What is the writer's favorite Chinese cultural activity?

A Eating Chinese food
B Writing Chinese characters
C Painting in the traditional Chinese style
D Practicing Chinese martial arts

3. What did the writer's teacher say about Chinese students in comparison to students in the United States?

A Chinese students are more highly motivated to study English than American students are to study Chinese.
B Chinese students have more opportunities to practice English than American students have to practice Chinese.
C Chinese students' proficiency level in English is higher than American students' proficiency level in Chinese.
D Chinese students' knowledge of American culture is greater than American students' knowledge of Chinese culture.

4. What site in China is the writer most looking forward to visiting?

A The Imperial Palace in Beijing
B The Shaolin temple in Henan
C The Terracotta Army in Xi'an
D The panda preserve in Sichuan

APPENDIX C: BURKE INTERVIEW MODIFIED FOR CFL READERS

(BIMCFLR)

Name_____Gender_____Date_____

References_____

Year in college_____ Major_____ Age _____ Language background _____

Previous foreign language learning experience _____

Study abroad experience _____

Study abroad experience in China _____

Starting questions:

Why are you learning Chinese?

What are your feelings about learning Chinese?

What are your fears about learning Chinese?

How much knowledge do you have about China and Chinese culture?

1. When you are reading Chinese text and you come to something that gives you trouble, what do you do? Do you ever do anything else?

2. Who is a good reader of Chinese texts that you know?

3. What makes _____a good reader?

4. When _____does come to something that gives him/her trouble, what do you think he/she does about it?

5. If you knew that someone was having difficulty reading Chinese texts, how would you help that person?

6. What would a teacher do to help that person?

7. How did you learn to read in Chinese?

8. Is there anything you would like to change about your Chinese reading?

9. Describe yourself as a reader of Chinese texts. What kind of reader are you?

10. Do you read materials written in Chinese, like every day or every week? What do you read if you do?

11. What do you like most of all to read Chinese text?

12. Can you remember any special book or the most memorable thing you have ever read that is written in Chinese?

13. What is the most difficult thing you have to read in Chinese?

14. When you read Chinese, do you have to sound out every word (either out loud or in your mind) or can you understand just by looking at the characters?

15. When you are reading a Chinese text, you have some Chinese characters that you cannot recognize, what do you do? Do you ever do anything else?

16. What are your main concerns when you read Chinese texts? What makes something difficult to read?

17. How do you like reading a Chinese text marked by Pinyin? How do you feel comfortable with reading Chinese texts without marking pinyin?

18. What is your favorite version of Chinese texts, Chinese character only, Pinyin only, or Chinese characters with Pinyin marked above them? Which one is most difficult for you to read? Why do you think so?

19. Can you reflect on the errors you made and talk about each of them?

20. Can you understand a Chinese text with the help of pinyin without recognizing most of the characters?

21. Do you feel that you read Chinese and English texts differently? If so, how?

22. Do you feel that your English reading skills can be reading Chinese texts? If so, how?

23. What do you think of yourself as a Chinese reader?

24. What makes a good Chinese reader of Chinese written texts?

25. Is there anything you would like to change about your reading of Chinese texts?

26. Is there anything else about the task you would like to talk?

APPENDIX D: ANALYSIS OF ORAL READING ERRORS BY CLAY (CLAY, 2000)

1. Conduct miscue analysis of each error and decide if it is a meaning, structure, or visual error using the following criteria:

    M - Did the reader's prior knowledge or the context in which a particular word is embedded causes the error?

    S - Did the structure (syntax) of the sentence influence the response?

    V - Did visual information from the print influence any part of the error (stroke, radical, or character)?

2. Count the number of errors associated with different cueing systems. These numbers reflect the reader's use of different language cueing systems.

3. Calculate error rate by dividing the number of each type of errors by the total number of errors. For example, if a participant made 10 errors in total and three of them are meaning errors, the rate for meaning errors would be 3/10 = 0.33.

Quantifying the Running Record

1. Count the running words:

2. Rate of error to running words: $\frac{Errors}{Running\ Words}$

3. Accuracy rate: $100 - \frac{E}{RW} \times \frac{100}{1}$

4. Self-correction rate: $\frac{SC}{E+SC}$

APPENDIX E: IRB APPROVAL LETTERS

The UNIVERSITY of OKLAHOMA

Institutional Review Board for the Protection of Human Subjects

Approval of Initial Submission – Expedited Review – AP01

Date: April 15, 2014

IRB#: 4053

Principal Investigator: Yanrong Qi, MA

Approval Date: 04/14/2014

Expiration Date: 03/31/2015

Study Title: A Mixed Methods Research to Explore the Oral Reading Behaviors and Reading Strategies of American College Learners Read Chinese as a Foreign Language

Expedited Category: 6 & 7

Collection/Use of PHI: No

On behalf of the Institutional Review Board (IRB), I have reviewed and granted expedited approval of the above-referenced research study. To view the documents approved for this submission, open this study from the *My Studies* option, go to *Submission History*, go to *Completed Submissions* tab and then click the *Details* icon.

As principal investigator of this research study, you are responsible to:

- Conduct the research study in a manner consistent with the requirements of the IRB and federal regulations 45 CFR 46.
- Obtain informed consent and research privacy authorization using the currently approved, stamped forms and retain all original, signed forms, if applicable.
- Request approval from the IRB prior to implementing any/all modifications.
- Promptly report to the IRB any harm experienced by a participant that is both unanticipated and related per IRB policy.
- Maintain accurate and complete study records for evaluation by the HRPP Quality Improvement Program and, if applicable, inspection by regulatory agencies and/or the study sponsor.
- Promptly submit continuing review documents to the IRB upon notification approximately 60 days prior to the expiration date indicated above.
- Submit a final closure report at the completion of the project.

If you have questions about this notification or using iRIS, contact the IRB @ 405-325-8110 or irb@ou.edu.

Cordially,

Lara Mayeux

Lara Mayeux, Ph.D.
Chair, Institutional Review Board

The UNIVERSITY of OKLAHOMA

Institutional Review Board for the Protection of Human Subjects

Approval of Continuing Review – Expedited Review – AP0

Date: April 10, 2015 **IRB#:** 4053

Principal Investigator: Yanrong Qi, MA **Approval Date:** 04/10/2015 **Expiration Date: 03/31/2016**

Expedited Category: 6 & 7

Study Title: A Mixed Methods Research to Explore the Oral Reading Behaviors and Reading Strategies of American College Learners Read Chinese as a Foreign Language

Based on the information submitted, your study is currently: Active, open to enrollment. On behalf the Institutional Review Board (IRB), I have reviewed and approved your continuing review application. To view the documents approved for this submission, open this study from the *My Studies* option, go to *Submission History*, go to *Completed Submissions* tab and then click the *Details* icon.

As principal investigator of this research study, you are responsible to:

- Conduct the research study in a manner consistent with the requirements of the IRB and federal regulations 45 CFR 46.
- Obtain informed consent and research privacy authorization using the currently approved, stamped forms and retain all original, signed forms, if applicable.
- Request approval from the IRB prior to implementing any/all modifications.
- Promptly report to the IRB any harm experienced by a participant that is both unanticipated and related per IRB policy.
- Maintain accurate and complete study records for evaluation by the HRPP Quality Improvement Program and, if applicable, inspection by regulatory agencies and/or the study sponsor.
- Promptly submit continuing review documents to the IRB upon notification approximately 60 days prior to the expiration date indicated above.
- Submit a final closure report at the completion of the project.

You will receive notification approximately 60 days prior to the expiration date noted above. You are responsible for submitting continuing review documents in a timely fashion in order to maintain continued IRB approval.

If you have questions about this notification or using iRIS, contact the IRB @ 405-325-8110 or irb@ou.edu.

Cordially,

Lara Mayeux, Ph.D.
Vice Chair, Institutional Review Board

The UNIVERSITY of OKLAHOMA

Institutional Review Board for the Protection of Human Subjects

Final Report – Inactivation

Date: April 05, 2016 **IRB#:** 4053

To: Ms Yanrong Qi, MA **Inactivation Date:** 04/05/2016

Study Title: A Mixed Methods Research to Explore the Oral Reading Behaviors and Reading Strategies of American College Learners Read Chinese as a Foreign Language

On behalf of the Institutional Review Board (IRB), I have reviewed the Final Report for the above-referenced research study. You have indicated that this study has been completed and should be inactivated. This letter is to confirm that the IRB has inactivated this research study as of the date indicated above.

Note that this action completely terminates all aspects and arms of this research study. Should you wish to reactivate this study, you will need to submit a new IRB application.

If you have questions about this notification or using iRIS, contact the IRB at (405) 325-8110 or irb@ou.edu.

Cordially,

Lara Mayeux

Lara Mayeux, Ph.D.
Vice Chair, Institutional Review Board