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Second language reading of adolescent ELLs: a study of response to retrospective miscue analysis, error coding methodology and transfer of L1 decoding skills in L2 reading

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SECOND LANGUAGE READING OF ADOLESCENT ELLS: A STUDY OF RESPONSE TO RETROSPECTIVE MISCUE ANALYSIS, ERROR CODING METHODOLOGY AND TRANSFER OF L1 DECODING SKILLS IN L2 READING

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ABSTRACT

It is well documented that ELLs face significant challenges as they develop literacy skills in their second language (NCES, 2007, 2011). This population is diverse and growing rapidly in Massachusetts and across the nation (Massachusetts Department of Elementary and Secondary Education, 2013; NCELA, 2011; Orosco, De Schonewise, De Onis, Klingner, & Hoover, 2008). Yet, this population is often left out of reading studies because of the range of variables they present (Klingner, 2010). This research focuses on the effects of a reading approach on adolescent ELLs, the power of coding systems to capture ELLs' reading errors and how exposure to a second writing system develops metalinguistic skills.

In the first study of this dissertation, I examine the effects of an approach called Retrospective Miscue Analysis (RMA; Goodman & Marek, 1996) on six subjects in a school setting, using an n-of-one design to evaluate changes in their reading attributable to RMA. RMA has been researched with diverse learners in case studies; however, data had not been collected to demonstrate whether it could change subjects' fluency or

reading comprehension in addition to their attitudes about reading and themselves as readers. My results suggest that students had positive feelings about RMA and believed that they had learned new ways to read, but the results do not point to immediate changes in their decoding accuracy, reading comprehension or fluency with RMA. This approach may have latent effects on overall reading performance by increasing motivation and self-confidence, but it did not appear to have immediate effects on my subjects' reading performance.

The second study of this dissertation provides a methodological exploration of two coding systems. The first coding system, Reading Miscue Inventory (RMI; Goodman, Watson, & Burke, 2005) originated in miscue analysis research. The second coding system was developed by Cheng and Caldwell-Harris (to appear) to code oral reading errors Chinese readers made when reading Chinese, and it was also used by the researchers to code native English speakers' oral reading errors. Interview data from RMA was used as an additional lens for understanding the power of coding systems to reveal information about reading miscues, or oral reading errors. The results indicate that RMI needs revision for use with English language learners (ELLs), especially in the Meaning Construction category, but RMI also reminds us to consider miscues within the context of connected text. Cheng and Caldwell-Harris' system, on the other hand, appears to accurately illuminate general relationships between a target word and a reader's error but is limited to word-level analysis of oral reading errors.

The third study of this dissertation examined patterns of oral reading errors according to ELLs' first language (L1) background to explore how L1 reading

experiences affect the metalinguistic skills second language (L2) readers bring to reading in their L2. Statistical analysis of real word versus nonword oral reading errors subjects made revealed distinct patterns in L2 readers who had learned to read in Chinese versus Cyrillic writing systems. I argue that this difference in errors made by Chinese and Cyrillic readers supports Koda's (2009) Transfer Facilitation Model, which states that metalinguistic awareness reflects the systematic differences in writing systems readers become accustomed to. This difference in errors also appears to contradict predictions that transfer is less operable across unalike orthographies. I also explore Koda's (2009) hypothesis that experience reading a L2 should lead to changes in metalinguistic skills over time. My findings suggest that experienced L2 readers' decoding skills may not change, or may take significant time to change, with exposure to a second writing system.

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CHAPTER 1: INTRODUCTION

1.1 Background and Rationale

Reading is essential for success in school and society. The International Reading Association (IRA) Commission on Adolescent Literacy has stated:

> Adolescents entering the adult world in the 21st century will read and write more than at any other time in human history. They will need advanced levels of literacy to perform their jobs, run their households, act as citizens, and conduct their personal lives. They will need literacy to cope with the flood of information they will find everywhere they turn. They will need literacy to feed their imaginations so they can create the world of the future (Moore, Bean, Birdyshaw, & Rycik, 1999, p. 3)

Yet, despite the high standards of literacy that adolescents must achieve as they transition into the adult world and the difficulty that many experience meeting these, government initiatives in literacy focus primarily on developing reading programs designed for preschool- through middle school-aged students. Further, few high schools provide literacy interventions outside of special education programs (Ehren, Lenz, & Deshler, 2004).

One subgroup of adolescents that performs particularly poorly on reading measures is English language learners (ELLs; NCES, 2007). The 2011 National Assessment for Educational Progress (NAEP) reported that only 29 percent of ELLs in eighth grade scored at the basic level or higher in reading, compared to 78 percent of non-ELLs (NCES, 2011). The ELL population in the United States is diverse and

growing (Orosco, De Schonewise, De Onis, Klingner, & Hoover, 2008); for example, between 1995-2010 the limited English proficient (LEP) population attending U.S. schools grew 63.54%, compared to the 4.44% for the entire K-12 population (NCELA, 2011). And in 2012-2013, Massachusetts reported 73,217 ELL students, 36% of whom were enrolled in grades 6-12 (Massachusetts Department of Elementary and Secondary Education, 2013). Yet this population is often left out of research because of the range of additional variables that they present (Klingner, 2010). The research in this dissertation investigates the reading patterns of this often-overlooked population.

Adolescent English language learners, who begin schooling in English after the age of twelve, face the dual challenge of learning to speak a second language and grasping cognitively-challenging academic content through sophisticated texts written in that language (Kieffer, 2009). And, they are unique from young monolingual English-speaking children with whom most literacy research is conducted. Younger monolingual English-speakers learning to read have had less experience reading, but, unlike second language learners, they are fluent in the language they are decoding. On the other hand, ELLs with reading experience in their first language usually master the ability to decode English quickly and catch up with their English-speaking peers on benchmark assessments in this area. It is vocabulary and reading comprehension that continue to be challenges (August & Shanahan, 2006; Carlo & Bengochea, 2011; Jiménez, García, & Pearson, 1995, 1996; Kieffer & Lesaux, 2010). This disparity is especially problematic in the upper grades when students must read for information. For these reasons, studies of younger children and findings on instructional approaches cannot easily generalize to

older ELLs. Indeed, more research is needed on ways to foster strong literacy skills for these learners through the high school years. This dissertation contains three studies that speak to this focus. Each is described below.

1.2 Study One: The Retrospective Miscue Analysis (RMA) Approach

Response to Intervention (RtI) is an approach to providing early identification and support to learners who do not meet learning benchmarks, and it has been adopted by many public schools across the nation. In RtI, research-based practices are used to accelerate learning before a learner is evaluated for learning disabilities, and the student's progress is closely and frequently monitored (Fuchs & Fuchs, 2006). With this model, practitioners need research-backed interventions that can be implemented effectively with adolescent second language learners in the school context. As part of this process, this study first investigated the effectiveness of Retrospective Miscue Analysis (RMA; Goodman & Marek, 1996), a reading approach that had positive outcomes with native English-speakers of all ages and proficient adult second language speakers of English.

Miscue analysis was designed as a tool for teachers and researchers to better understand the reading process (Goodman, 1969; Goodman & Burke, 1972; Goodman & Marek, 1996; Goodman, Watson, & Burke, 2005; Goodman, Wang, Iventosh, & Goodman, 2012; Leu, 1982) as well as a means of helping readers within the classroom environment (Goodman & Marek, 1996). It was first found effective at increasing adult and middle school struggling readers' self-confidence, helping them to conceive of reading as a meaning-making endeavor (Goodman, & Marek, 1996; Marek, 1987). This

approach emerged from the beliefs that (a) reading is a transactional, sociolinguistic process that results in making meaning with a text and that (b) "[w]hat the reader brings to the text—experience, attitudes, concepts, cognitive schemes—is as important as what the author brought to it in creating it. The reader's act is creative, too; meaning is created in response to the text" (Goodman & Marek, p. 15). In RMA, students are taught to analyze their own miscues from recordings of their oral reading and think about them as evidence of their *interaction with* a text rather than their *deviation from* the text. This is meant to empower struggling readers, reevaluating themselves as readers and focusing on meaning over text-level features.

Goodman and Marek (1996) define a miscue as "an observed response that differs from what is expected" (p. 21). Over the course of the RMA process, readers are guided to the recognition that *all readers make miscues* and that *some miscues disrupt meaning more than others*. First, the reader records his/her reading of a text while the teacher or researcher listens and marks miscues on a copy of the text. Next, the researcher listens to the miscues and creates a Reading Miscue Inventory (RMI; Goodman, Watson, & Burke, 2005) to capture patterns in the reader's errors (e.g., the number and types of miscues and the degree to which these change the text's meaning). Procedures for generating a RMI are outlined in full in Section 2.2.4.6.

In the next RMA session, the reader and the researcher listen to the audio recording of the reading and discuss the miscues. Sometimes the miscues are preselected by the researcher, and sometimes the student guides the RMA session. The researcher asks the reader questions such as: *Did this miscue change your understanding of the*

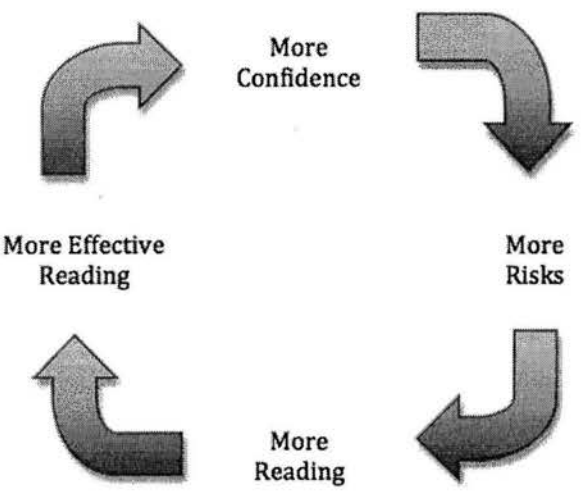
text?; Did you need to correct it?; Why do you think you made this miscue? (see Table 7, below, for a complete list of interview questions). Although RMA was originally developed for use with struggling readers, in recent research Wurr, Theurer, and Kim (2008) used RMA with proficient adult English-as-a-second-language (ESL) readers to increase subjects' awareness of syntactic, semantic, graphophonic and pragmatic cueing systems.

Perhaps because its developers focused on sociolinguistic and transactional aspects of the reading process in their research or perhaps because they support a whole language approach to reading instruction, they make no claims about the effect of RMA on any of the areas of reading emphasized by the *National Literacy Panel* (phonological awareness, alphabetic principle/phonics, fluency, vocabulary, and comprehension) or the two additional areas found by the *National Literacy Panel* to be highly important for the development of second language reading (oral language and motivation; August & Shanahan, 2006). Theurer (2011), in fact, claims that evaluating the effect of RMA on fluency would contradict the transactional theory of reading that undergirds the procedure, as "[t]he goal of reading is not to read at an ever increasing speed with 100% word identification accuracy" (p. 174) but rather to construct "meaning and a personal text parallel to the published text" (Paulson & Goodman, 2008, p. 33).

The case studies that have used RMA documented improvements in individual readers' *quality* of miscues (i.e., they made fewer miscues that changed meaning) and *quantity* of miscues over time (Marek, 1987) with the Reading Miscue Inventory (RMI) coding system (Goodman, Watson, & Burke, 2005). Yet, the goals and methodology of

previous RMA studies make it difficult to unequivocally attribute growth to RMA. RMA's developers theorize that reading improves as a result of RMA due to the cycle of revaluing (see Figure 1), and RMA may, in fact, target and develop a belief about reading that cannot be detected by measures of decoding, fluency, vocabulary or comprehension. Nonetheless, it is still important (and especially so with the adoption of RtI) to investigate changes in ELL readers' skills in these areas during and after RMA. Such information would help practitioners assign the procedure to students who would benefit most from it.

Figure 1: The Cycle of Revaluing (from Goodman & Marek, 1996, p. 206)



I selected RMA because this procedure can help me identify patterns in second language reading and it is minimally invasive, allowing me to collect authentic data in an authentic setting. I was also interested in evaluating whether RMA had an effect on students' decoding skills, fluency or reading comprehension, or whether it only affected patterns seen with the RMI and student interviews. This approach differs from previous research, which has evaluated RMA with the RMI and student interviews only (Goodman

& Marek, 1996; Marek, 1987; Wurr, Theurer, & Kim, 2008).

This study evaluated whether participants demonstrated improvement in their reading after using RMA for four weeks. I used the measures (RMI and interviews) previous researchers had developed for evaluating RMA along with more widely used measures of decoding accuracy, fluency, vocabulary, and comprehension (the PPVT-4 and QRI-5). I also used an n-of-one design so I had a baseline of students' reading and oral language proficiency before RMA both to compare to a post-RMA measure and to account for any changes in students' English proficiency that may have affected results. Finally, students were interviewed before and after RMA to gather information about motivation and engagement.

1.3 Study Two: Comparison of Coding Systems for Analysis of Oral Reading Errors

During the Retrospective Miscue Analysis process I recorded a wealth of oral reading miscues. The miscues that readers make when reading aloud are fascinating—what causes one to say something different from what is printed on a page? Yet, unequivocal answers to this question are hard to come by. In the second study, I explored the methodological challenges of coding miscues, or oral reading errors[1].

Existing research on RMA (Goodman, & Marek, 1996; Marek, 1987; Theurer, 2010; Wurr, Theurer, & Kim, 2008) has employed RMI (Goodman & Burke, 1972; Goodman, Watson, & Burke, 2005) for coding miscues, but as I used this system, I

[1] Goodman, Watson and Burke (2005) call instances when readers read something different from the printed text a miscue. The second coding system I employed calls these instances oral reading errors (Cheng & Caldwell-Harris, to appear).

realized it didn't allow for representation of some patterns in the data I felt were unique to second language readers. To explore such patterns, I also coded all data with another coding system that was developed for psycholinguistic research with Chinese readers and had been used with English speakers as well (Cheng & Caldwell-Harris, to appear). Finally, I looked at 134 conversations I had during RMA with students about their miscues to see if the way the coding systems characterized oral reading errors matched students' thoughts about their errors. Readers are not always conscious of the processes they are engaging in when they read, but these conversations provided a fascinating and valuable counter-point to external assessment tools.

For example, one of my subjects read the following sentence in an adapted version of *The Phantom of the Opera*:

2723 One day a little boy and his governess walked
c
|**one**
2724 |**on** the beach near Christine and her father.

The bold words show the text (on the bottom) and the miscue (on the top). The boxed c indicates that the reader corrected this error before moving on. The Reading Miscue Inventory (RMI) used in Retrospective Miscue Analysis (RMA) characterizes this miscue as one that results in no loss of meaning and demonstrates strong grammatical relations because it was corrected. It also codes this miscue as having high graphic similarity to the original text and some sound similarity. The Goodman Taxonomy of Reading Miscues (Goodman, 1969) would additionally guide the researcher to consider that the word "one" occurs in the text at the beginning of the sentence and is in the reader's

peripheral vision. Cheng and Caldwell-Harris (to appear) would code this error as an orthographic substitution error because the target word and the read word have letters in common. In their system, at least two phonemes need to be alike in the target and actual word for the error to be considered a phonological substitution. When I interviewed this reader about his error, he told me it occurred because he just wasn't thinking. He didn't feel it sounded the same and only agreed it looked a little the same when I told him *I* thought it looked the same. Taken together, the coding of the RMI, the coding of Cheng & Caldwell-Harris' system and the information from the interview with the reader indicate the many dimensions of a simple miscue.

Employing these various systems, I was able to draw conclusions about benefits and drawbacks of each as a lens for examining second language reading. Furthermore, the results provide insight on ways instructors can be more accurate in evaluating the miscues, or oral reading errors, of ELLs.

1.4 Study Three: Patterns in ELLs' Oral Reading Errors and What They Can Tell Us About the Influence of L1

In the third part of my research, I highlight reading patterns of ELLs and explore the hypothesis that L1 reading experiences influence the strategies and skills these readers use when decoding a second language (L2) orthography. Significant research from the fields of reading and psycholinguistics suggests that, despite the challenges adolescent ELLs face in reading a new language, their L1 literacy may give them advantages that younger learners do not have as they learn to read their L2. Namely,

most have already learned to read and bring metalinguistic skills from this experience to reading in their second language (Holm & Dodd, 1996; Koda, 1998; Leong, Hau, Cheng, & Tan, 2005; Liow & Lau, 2006; Wang, Koda, & Perfetti, 2003; Wang & Geva, 2003).

Research has explored the role of metalinguistic skills, particularly phonological awareness, in young Spanish-speakers' English reading development (August & Shanahan, 2006; Bernhardt, 2000; Klingner, Hoover, & Baca, 2008; Koda & Zehler, 2008; Lenski & Verbruggen, 2010; Shatz & Wilkinson, 2010). However, there is less research on the development and interaction of metalinguistic skills in older, literate second language learners and learners who speak and read languages that do not use a Roman alphabet. Subjects recruited for this study initially learned to read and write either in a non-alphabetic orthography (Chinese) or in an alphabetic orthography that is not based on the Roman alphabet (Cyrillic).

For an experienced reader, learning to read in a second language is affected by both the universal properties of reading and the metalinguistic skills that are developed in the process of learning to speak and read in the first language. However, the world's writing systems differ in how they encode language, and a reader's repeated engagement in reading a particular writing system develops varying metalinguistic skills, depending on the linguistic and orthographic properties of the language read (Holm & Dodd, 1996; Koda, 2008b; Muljani, Koda & Moates, 1998). For example, if the writing system encodes sounds at the phoneme level, the reader will usually develop strong phonemic awareness, but if the writing system encodes sound at the syllable level, phonemic awareness may not be as acute (Holm & Dodd, 1996; Read, Zhang, Nie, & Ding, 1986).

Generally speaking, reading is "embedded in a spoken language and its writing system, and as such, its acquisition universally requires all learners to make links between language elements and the graphic symbols representing them" (Koda, 2008b, p. 223); however, the way in which these universal properties are encoded (and decoded) varies cross-linguistically. In some languages, for example, the primary mapping unit is phonology (i.e., graphemes represent the sounds of speech—phonemes or syllables—used to make words); in others, it is morphology (i.e., graphemes represent semantic units of words; Perfetti & Dunlap, 2008). In alphabets, such as the Roman or Cyrillic alphabets, graphemes in a written word usually correspond to one sound. In syllabic Japanese Hiragana, each grapheme corresponds to one syllable. In logographic Chinese, each grapheme (or character) corresponds to one morpheme (see Table 1). Of course, in each of these writing systems sounds and morphemes are represented in print, but the primary mapping systems differ. Therefore, experience in the L1 orthography develops particular phonological, morphological and semantic awareness competencies, which may or may not transfer to reading in a new orthography.

Table 1: Three Types of Writing Systems (from Perfetti & Dunlap, 2008)

Alphabetic	한국 Hangul (Korean)
Syllabary	ひらがな Hiragana (Japanese)
Logographic	中文 Zhōng wén (Chinese Mandarin)

Metalinguistic awareness "enables learners to analyze and segment language forms...[, and] the language-specific facets of metalinguistic awareness are seen as outcomes of literacy, closely attuned to the linguistic and orthographic properties of the language in which literacy is learned" (Koda, 2008b, p. 223). When first and second language writing systems are similar (two alphabetic orthographies vs. an alphabetic and a logographic orthography), reading performance in the second language is more rapid and accurate (Koda, 2008a; Perfetti & Dunlap, 2008). Studies (e.g., Akamatsu, 1999; Brown & Haynes, 1985; Green & Maera, 1987) suggest that adult "second-language learners with typologically diverse first-language backgrounds use qualitatively different procedures when reading the same (target) second language" (Koda, 2008a, p. 72). Since orthographies differ in how they encode linguistic information and languages also differ in linguistic properties, the degree to which metalinguistic skills are available in second language reading can be expected to differ too, depending on how similar the first and second languages and their writing systems are, how developed proficiency in the second language is, and how much experience the individual has in his/her first language.

Studies of individuals who are literate in different first languages and are learning to read English (L2) have begun to demonstrate the influence of the first language and first writing system on their English reading. For example, at least one study (Wang, Koda, & Perfetti, 2003) suggests that adult Chinese (L1) readers of English may apply a lexical decoding strategy, while Korean (L1) readers of English may apply a sublexical decoding strategy (using either phonological or morphological information to read words), despite the fact that Korean uses an alphabet that differs significantly from the

Roman alphabet used in English. In fact, "[r]ecent brain imaging research suggests that the brain network for reading accommodates to properties of the writing system, although this may be truer for learning Chinese than for learning an alphabetic system" (Perfetti & Dunlap, 2008, p. 35), due to the fact that the whole word reading strategy applied in reading Chinese can be applied to reading an alphabet, but Chinese cannot be decoded phonemically.

This study was limited in its ability to determine transfer of metalinguistic skills because subjects were not administered reading measures in their native languages, but it provides qualitative and quantitative data on the metalinguistic skills second language readers from diverse first language backgrounds use as they develop reading skills in English. The longitudinal nature of data collection during RMA also enabled me to explore second language readers' metalinguistic skills over time.

1.5 Organization of the Dissertation

This dissertation is organized into five chapters. In this first chapter, I provide a general introduction to the research conducted with adolescent ELL readers and the need for such research. In Chapter 2, I discuss the RMA approach and how the ELLs in my study responded to it. In Chapter 3, a methodological study, I compare three ways of analyzing miscues, or oral reading errors, and discuss the types of insight each can provide on the reading processes of ELLs. In Chapter 4, I present an analysis of the error patterns exhibited by Cyrillic (L1) and Chinese (L1) readers when they read in their second language and discuss what these patterns may suggest about the influence of the

L1 orthography. In Chapter 5 I draw general conclusions about the body of research and discuss implications for educators as well as directions for future research.

The specific research questions posed in this dissertation are:

1. What effect does Retrospective Miscue Analysis have on adolescent ELLs' reading? (Study 1; Chapter 2)
2. What are the strengths and limitations of Reading Miscue Inventory and Cheng and Caldwell-Harris' coding system for coding ELLs' miscues? (Study 2; Chapter 3)
3. What do patterns in L2 reading errors suggest about transfer of L1 decoding skills? (Study 3; Chapter 4)

In sum, to teach adolescent second language readers, who must acquire fluency and comprehension quickly in order to be successful in school, it is essential that we understand how reading instruction impacts this population's reading, how different tools measure their skills, and what patterns they are likely to exhibit in reading their second language.

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CHAPTER 2: USING RETROSPECTIVE MISCUE ANALYSIS WITH ADOLESCENT ENGLISH LANGUAGE LEARNERS

2.1 Background

Retrospective Miscue Analysis (RMA) is an approach born out of a sociopsycholinguistic, transactional reading theory "that engages readers in reflecting upon and evaluating the reading process through analyzing their oral reading miscues" (Goodman & Marek, 1996, p. ix). Its developers stress their belief that both successful readers and struggling readers deviate from the printed text, and these errors differ in the extent to which they disrupt meaning. According to its designers, understanding that not all miscues are bad can help individuals

> ...come to revalue themselves as readers. Through analyzing their own reading, readers discover for themselves that reading is a process of predicting, inferring, sampling, confirming, and correcting...Readers become aware that graphophonic, syntactic, and semantic cuing systems in language provide information as readers construct meaning from print. Most important, they dismantle the notion that good reading is represented by error-free reproductions of text. (pp. ix-x)

Furthermore, teachers may also learn something from RMA about the reading process. In fact, a second goal of the RMA approach is for instructors to glean both information about an individual reader's strengths and weaknesses and knowledge about the reading process in general.

RMA (Goodman & Marek, 1996) has been shown to increase adult and middle school struggling readers' self-confidence and help them conceive of the reading process as a meaning-making endeavor (Goodman & Marek, 1996; Goodman, Watson, & Burke, 2005a; Marek, 1987). To help struggling readers revalue themselves as readers and focus on meaning over text-level features, during RMA, students are recorded while reading texts aloud and are taught to analyze their own miscues by listening to those recorded oral readings. The goal is for participating readers to recognize that all readers make miscues but some disrupt meaning more than others.

Consider the following two miscues:

		/jutərd/
4722		He **uttered** these words: "I'm not going
4723	to leave	you!

In the first sentence the student read /jutərd/[2] instead of 'uttered'. According to the Reading Miscue Inventory (RMI) system for coding errors, this miscue would result in a loss of meaning because it is a nonword. In the second sentence, the student omitted the word 'you' from his reading. According to the RMI system, this miscue would result in no loss of meaning because the sentence 'I'm not going to leave' is the same as 'I'm not going to leave you' in the context of this story. In RMA, the researcher or teacher would guide the reader to see the second miscue as higher in quality, acceptable, and perhaps even a more authentic phrasing for the reader.

Although RMA was originally developed for use with struggling readers, Wurr,

[2] The student read a nonword. This is transcribed in IPA.

Theurer, and Kim (2008) used this procedure with proficient adult ESL readers and found it to increase subjects' awareness of syntactic, semantic, graphophonic and pragmatic cueing systems.

The three case study participants in Wurr, Theurer, and Kim's (2008) study each read three to four texts. The time span for these readings was not noted for the first participant, but was indicated to be two months for the second participant. The researchers noted an improvement for the first participant in meaning construction and grammatical relationships as indicated by the number of miscues that preserved text meaning and grammar. The percentage of miscues that resulted in a loss of meaning across the three readings was 52%, 42% and 46% respectively. The percentage of miscues that demonstrated grammatical weakness across the three readings was 56%, 30%, and 7%.

The decrease in grammatical weakness suggested by these percentages is impressive, but, upon closer examination, there are methodological issues that should preclude an unequivocal conclusion about improvement. First, this was based on a relatively small sample of miscues (a total of 25 miscues in the first reading; 26 miscues in the second reading; and 13 miscues in the third reading). Goodman, Watson, and Burke (2005a) recommend that a text used for miscue analysis with older readers should have 500 words (the third text above had only 401 words), and "recommend 25-50 consecutive miscues be coded to arrive at patterns of readers' strategies and to understand their knowledge of language" (p. 131). They go on to warn: "if students don't produce enough miscues for analysis, the data will be insufficient to compile a representative

profile of their reading" (p. 54). On average across the three participants, the subjects in Wurr, Theurer, and Kim's (2008) study made 26 miscues per reading, but only 56% of the 9 readings had at least the recommended 25 miscues.

A second methodological issue arises from inconsistency in text selection. Wurr, Theurer, and Kim (2008) do not explain how or if they made certain that the different texts their subjects read were matched to the subjects in reading level. The study also provides no information about how text difficulty was controlled across the three trials, which is surprising as the question of text difficulty in miscue analysis studies has been a concern for a number of years (Leu, 1982).

Wurr, Theurer, and Kim (2008) concluded that their second case study participant demonstrated increased confidence and understanding of the reading process after RMA based on interview data. However, there was not noticeable improvement in this subject's miscues that preserved meaning construction or grammatical relationships as measured by Reading Miscue Inventory. The third case study participant demonstrated improvement in meaning construction, as measured by the RMI, and understanding of the reading process but did not improve in grammatical relationships. The researchers concluded that, in general, RMA helped readers to tap into and transfer their L1 reading skills in order to make meaning of text and to focus less on their L2 accuracy. In sum, the quantitative data provided in the Reading Miscue Inventories of this study may be inconclusive in their ability to illuminate how this analysis impacted these L2 readers, but the qualitative data indicate attitudinal changes about reading.

A third methodological issue has been noted in other miscue analysis studies

(Leu, 1982) that have compared readers to each other. This is because the types of miscues readers make may differ not only because of their underlying approaches to reading but because of the relative difficulty a text presents to them. In other words, if two readers read the same text but it is an independent level text for one of the readers and a frustration level text for the other, the two readers are likely to make different types of errors due to text difficulty.

The current study is designed to address the methodological issues described above and determine whether RMA improves reading performance as measured by (a) RMI and interviews and/or (b) more traditional measures of decoding, fluency, vocabulary and comprehension.

2.2 Methodology

The study was conducted in an authentic school setting. The Massachusetts Department of Elementary and Secondary Education classified the focal school as a medium-incidence English language learner (ELL) district; therefore, the number of ELL students who could participate in the study was small. A combination of quantitative and qualitative measures allowed me to address the methodological problems noted in previous RMA research, while studying reading patterns and reading growth with this small sample of students in the school setting.

First, the study used a single subject 'n-of-one' design to establish a baseline for each student in the study; these measurements were used as a comparison for changes observed during and after RMA. Second, all reading miscues observed for each subject

over the time period of the study were recorded. Third, interview data was collected before, during and after the study. Interviews before and after the study focused on the readers' perceptions of themselves as readers and their evaluation of the RMA sessions. Interviews during RMA focused on students' explanations for the source of their miscues and feelings about whether they should have corrected individual miscues. Together, these measures provided a rich picture of each individual student's reading.

In order to measure reading skills before and after RMA, I used the Qualitative Reading Inventory-5 (QRI-5) (Leslie & Caldwell, 2011). This tool provides information about a subject's overall reading level, number of miscues, reading fluency and text comprehension. I additionally calculated the number of miscues, fluency and comprehension for RMA reading sessions and coded miscue data using the Reading Miscue Inventory (RMI; Goodman, Watson, & Burke, 2005a).

Second language learners vary considerably in their rate of L2 acquisition (Hakuta, Butler, & Witt, 2000). Some may take years to catch up with native speaking peers, while others demonstrate rapid growth in measures of language proficiency, including vocabulary, fluency, pronunciation and grammar, over short periods of time. At the time when the Massachusetts English Proficiency Assessment (MEPA) was administered in Massachusetts, it was not unusual for students in my district to test 1-2 proficiency levels higher on the exam after just six months in the United States. The Massachusetts Department of Elementary and Secondary Education's *Guide to Understanding the 2011 Annual Measurable Achievement Objectives (AMAO) Reports* (2012) also suggests such increases in proficiency should be anticipated. In order to

"make progress" according to those standards, ELLs who scored Level 1 Low – Level 3 Low on the fall administration of the MEPA needed to advance two steps by the spring administration of the MEPA, and students who had scored Level 3 High – Level 4 High needed to advance one step.

Since language proficiency plays a role in reading ability, I also needed to account for this variable in my baseline and post-RMA measurements. I used the Massachusetts English Language Assessment–Oral (MELA-O) (2010) to measure oral language proficiency and the Peabody Picture Vocabulary Test–4 (PPVT-4) (Dunn & Dunn, 2007) to measure knowledge of English vocabulary as part of the baseline and post-RMA measures. All measures are described in detail below.

2.2.1 Focal School

Schoenberg[3] High School is in an exceptionally high-performing public school district. According to the District Analysis and Review Tool (DART) for Schools, compiled by the Massachusetts Department of Elementary and Secondary Education (February 2012), in 2011-2012, the year data was collected, Schoenberg High School served 1,083 students from the town of Schoenberg, a suburb of Boston, Massachusetts. 2.1 percent of the high school population was limited English proficient (LEP), making the school a medium-incidence district according to the Massachusetts Department of Elementary and Secondary Education. One hundred percent of the high school student population scored proficient or above on the English language arts (ELA) section of the

[3] All names are pseudonyms.

Massachusetts Comprehensive Assessment System (MCAS) in 2011, and 98% scored at proficient or higher on the Mathematics section of the same exam. Additional data from the Massachusetts Department of Elementary and Secondary Education from 2010-2011 indicate 95% of the student body graduated in four years and 98% of the 2011 graduating class planned to attend a 2- or 4-year college. Average Scholastic Aptitude Test (SAT) scores for Schoenberg High School students who took the exam in 2009-2010 were 603 in Reading, 605 in Writing and 627 in Math. State averages for the SAT in 2009-2010 were 509, 505 and 524, respectively.

At the time the study was conducted, there were 26 students at Schoenberg High School who were limited English proficient, and 24 of these students were enrolled in the English language education (ELE) program. The native languages of the students in the ELE program in the 2011-2012 school year were Bulgarian (2), Chinese (9), Danish (1), Japanese (2), Korean (4), Mongolian (1), Nepali (2) and Russian (3). Students in the ELE program receive tutoring for 30 to 240 minutes a week, depending on their proficiency level. Additionally, lower proficiency students were enrolled in a Transitional English class as an alternative to a mainstream English class. Although the population of ELL students at Schoenberg High School is so small that it is difficult to make generalizations about performance trends on state and national tests, the DART (Massachusetts Department of Elementary and Secondary Education, 2012) indicated that three of the nine ELL students in 11th or 12th grade during the 2011-2012 school year were enrolled in at least one Advanced Placement (AP) course, and all of the graduating seniors who

either received ELE services or were monitored as Formerly Limited English Proficient (FLEP) during their senior year (n = 7) were accepted into 2- or 4-year colleges.

2.2.2 Investigator

I am a teacher at Schoenberg High School. Six of the nine participants in the study were in my Transitional English course, for which they received a grade and also received English tutoring from me. The other three students received ungraded ELL tutoring from me. In order to reduce the likelihood that students would feel pressure to participate in the study because I was their teacher, I used a video of a co-investigator to obtain assent from participants (see Appendix F for informed consent and assent forms). RMA sessions took place either during scheduled tutoring time, if students had no academic work they needed assistance with, or during their free time.

2.2.3 Participants

All subjects were nonnative speakers of English. I invited all students who were in the Transitional English class of the Schoenberg High School ELE program during the 2010-2011 or 2011-2012 school year and were still attending the school at the time of the study to participate. In order to establish that students met basic background criteria for age of exposure to English, educational history and motivation, I created a short questionnaire (see Appendix A). This questionnaire also included two additional questions about literacy instruction for Chinese participants, as one study (Holm & Dodd, 1996) suggested differences between the metalinguistic skills of individuals who learned

to read using Pinyin and individuals who did not use Pinyin.

Six of the nine subjects who began RMA completed four sessions and the post-RMA measures. One additional student who had transferred from another school without records of English language services volunteered and was included, though she did not complete all four reading sessions. The students were between the ages of 14-17, and none had begun schooling in an American school before the age of 13.

Of the six students who completed all measures, two spoke Chinese as a first language, two spoke Bulgarian as a first language, one spoke Mongolian as a first language, and one spoke Japanese as a first language (see Table 2). According to a preliminary questionnaire (see Appendix A), none of the students had stopped going to school for more than three months. All students had literacy skills (see Table 3) and reported being motivated to learn English and work hard in school (see Tables 4 and 5).

Table 2: Background Information Study Participants

	Native Language	Age At Beginning of RMA	Age of Arrival in U.S.	Months In U.S. School at Start of Participation	Age During First English Instruction	ELP at Start of Participa-tion (MEPA)	Number of RMA Sessions
Lan	Mandarin	14	14	7	11	3	RMA (4)
Bao-yu	Mandarin	14	14	3	3	3	RMA (4)
Xue*	Mandarin	17	14	39	10	5	RMA (3)
Chong*	Mandarin	15	13	12	8	4	RMA (2)
Ana	Bulgarian	15	15	8	7	2	RMA (4)
Marco	Bulgarian	16	15	7	8-9	5	RMA (4)
Eiko	Japanese	16	14	26	‡	5	RMA (4)
Bat	Mongolian	16	16	3	6	1	RMA (4)
Nikon*	Russian	18	17	15	‡	4	RMA (1)

*Data not included for evaluation of RMA because participants did not complete four sessions.

‡Student did not provide this information.

Table 3: Which kinds of material do you read at home?

	Fiction	Letters	Magazines	Newspapers	Test books	Non-fiction	Comic books	Textbooks
Lan	X	X				X		
Bao-yu	X	X	X	X	X			
Xue	X		X	X		X	X	
Chong	X		X				X	X
Ana	X	X	X	X		X		
Marco	X			X				
Eiko	X			X				X
Bat	X		X			X		
Nikon								

Table 4: Are you motivated to learn English?

	Always	Usually	Sometimes	Rarely	Never
Lan	X				
Bao-yu	X				
Xue		X			
Chong			X		
Ana		X			
Marco		X			
Eiko					
Bat		X			
Nikon					

Table 5: Do you work hard in school?

	Always	Usually	Sometimes	Rarely	Never
Lan		X			
Bao-yu	X				
Xue			X		
Chong			X		
Ana			X		
Marco		X			
Eiko					
Bat		X			
Nikon					

2.2.4 Instruments

2.2.4.1 *MELA-O* All ELLs (termed limited English proficient (LEP) by the state of Massachusetts) are required by the No Child Left Behind (NCLB) Act of 2001 to participate in yearly English proficiency testing. As a result of this mandate, English language proficiency for the subjects was measured at least once during the 2011-2012 academic year in March, with the *Massachusetts English Proficiency Assessment* (MEPA). Five students in their first year at a Massachusetts public school during 2011-2012 (Lan, Bao-yu, Ana, Marco and Bat) also took the MEPA in October, as per state regulations. The MEPA tested the four domains: reading, writing, speaking and listening, and results placed students into one of five proficiency levels. The MEPA exam was developed specifically for students in grades 9-12 and was administered from 2002-2012 in Massachusetts public schools. Descriptors of MEPA proficiency levels are included in Table 6. Participants' MEPA scores were used to determine English language proficiency level at the beginning of the study, as recorded in Table 2. This test was selected because its use was already in place at the school where the subjects were enrolled and would add no additional time to their participation.

Table 6: MEPA Performance Level Descriptions, Grades 3-12
(Massachusetts Department of Elementary and Secondary Education, 2010)

A student at **Level 1** cannot yet communicate in English and errors almost always interfere with communication. Comprehension is demonstrated either without words, through a few basic words, or in a language other than English. A student performing at this level typically • reads only a few simple written words or phrases, with help; • writes only a few simple words and a few short sentences with errors; • speaks using only a few English words with common errors, and is not easily understood; • understands only a little spoken English.

A student at **Level 2** communicates using simple written and spoken English at school, with errors that often interfere with communication and understanding. A student performing at this level typically

- reads and understands simple words, phrases, and a few simple sentences with help, but shows little awareness of features of written English;
- writes one or more simple sentences with some understanding of purpose and audience, but shows little control of grade-level standard English writing conventions;
- speaks using basic English words and phrases, and is generally difficult to understand;
- understands some basic spoken vocabulary, phrases, and simple questions, with frequent repetition and explanation.

A student at **Level 3** communicates using basic English at school, although errors sometimes interfere with communication and understanding. A student performing at this level typically

- reads and understands many common words and some grade-level academic vocabulary; can understand the main idea of some grade-level texts, and understands some grade-level features of written English;
- writes and edits simple sentences and paragraphs to suit an audience, and uses basic grade-level vocabulary; shows some control of grade-level standard English writing conventions;
- speaks using many basic English words and some grade-level academic vocabulary, creating original sentences, with some errors and pauses in conversation;
- understands most spoken English sentences and questions, some basic grade-level academic vocabulary, and grade-level texts read aloud, with some repetition and explanation.

A student at **Level 4** is generally fluent in English at school, and oral and written communication is mostly correct and usually understandable, with few or minor errors. A student performing at this level typically

- reads and understands most grade-level texts, including academic vocabulary and most grade-level features of written English;
- writes and edits short texts with few errors using basic grade-level academic vocabulary, and shows basic control of grade-level standard English writing conventions;
- speaks English with basic fluency, using grade-level words and sentences, with occasional errors;
- understands most spoken English during classroom discussions, with only occasional repetition and explanation.

A student at **Level 5** communicates effectively in English across all academic subjects, with few errors. The student shows control of standard English. Oral and written communication is correct and understandable. A student performing at this level typically

- reads and understands most grade-level texts, including a range of academic vocabulary;
- writes and edits texts of different lengths, giving details and descriptions to suit the purpose and audience, and shows a general control of standard grade-level English writing conventions;
- speaks English with grade-level fluency, using academic language and descriptive vocabulary in conversations and classroom discussions;
- understands spoken English during nearly all conversations and classroom discussions.

In addition to the state administration of the full MEPA, the Massachusetts English Language Assessment-Oral (MELA-O) portion of the MEPA was administered

before and after RMA as a control measure. The MELA-O was administered by either myself or by a co-investigator. Both investigators were Qualified MELA-O Trainers (QMTs).

2.2.4.2 Peabody Picture Vocabulary Test-4 (PPVT-4) The Peabody Picture Vocabulary Test-4 (PPVT-4; Dunn & Dunn, 2007) is a well-established measure of vocabulary. It measures receptive vocabulary knowledge by presenting words of decreasing frequency that students match to picture targets. The PPVT-4 was selected for use in this study as a vocabulary measure because it has been used in studies of second language learners who spoke a variety of first languages (e.g. Kieffer, 2009 with Spanish-speaking students; Wang, Yang, & Cheng, 2009 with Chinese-speaking students) as a way to measure vocabulary knowledge in English.

The PPVT-4 is an oral measure of vocabulary knowledge developed for and standardized on a national sample of more than 5,500 individuals from age 2;6 to 90. Data from over 3,000 individuals matching the U.S. Census for gender, race, ethnicity, region and socioeconomic status was used to create the normative scores. All reliability and validity coefficients for the PPVT-4 are in the .90s range.

Although the publisher, Pearson, has conducted reliability and validity testing for monolingual English speakers with the PPVT-4, they have not evaluated its use with the ELL population. In their chapter on language and literacy assessment written for the report of the *National Literacy Panel* on language-minority children and youth, García, McKoon, and August (2006) highlight studies that indicate bias issues with the PPVT-4

because it determines vocabulary knowledge by presenting an increasingly infrequent list of vocabulary in English, and word frequency may vary in different languages. The authors conclude, however, that "[a]lthough the previous research studies indicate that the PPVT may underestimate students' word knowledge, the PPVT may appropriately estimate how well language-minority children's recognition of mainstream English vocabulary matches that of native-English-speaking students" (p. 607). Therefore, as recommended by the PPVT-4 (2007) manual and García, McKoon, and August (2006), the measure was used only as a criterion reference and not as a norm reference or measure of intellectual capacity.

2.2.4.3 Qualitative Reading Inventory-5 (QRI-5) The Qualitative Reading Inventory-5 (QRI-5) is an informal assessment that includes word lists and passages designed to help teachers and researchers determine a child's independent reading level, instructional reading level and frustration level. The researcher can also assess the child's background knowledge in a text's topic area, keep track of reading miscues, measure fluency and evaluate a reader. This assessment's use of both word lists and passages to assess reading level addresses Kuo and Anderson's (2008) caution that "when studying the relationship between aspects of metalinguistic awareness and second language reading, reading comprehension should be assessed instead of, or in addition to, measures of word reading, because for second language readers, successfully decoding does not guarantee comprehension" (p. 59). Additionally, the qualitative nature of the assessment provides rich data valuable for the case study design of this study.

The word recognition section of the QRI-5 contains ten word lists consisting of 20 words each, ten of which also appear in passages of connected-text, and is typically administered first to determine the appropriate passage level to have a student read for the oral reading section of the assessment. The word lists begin with a primer readability level and end with a high school readability level.

The oral reading section of the QRI-5 consists of 54 passages ranging in readability levels from pre-primer through high school level. Grade scores are derived from the number of miscues (any non-dialectal deviations from the text) as well as the student's ability to answer comprehension questions. Some comprehension questions have answers that can be found directly in the text, and some have answers that require students to infer information from the text. The QRI-5 has been pilot tested with 1,000 students, and tests of inter-scorer reliability are 98% or higher.

As stated above, to determine reading level on the QRI-5, the subject first reads graded word lists, and these are followed by one or more oral reading passages. Some of the passages in the QRI-5 are narrative and some are expository. In addition to using the word lists to gauge the right text level to start at with a student, the researcher asks the subject a series of prior knowledge questions associated with the selected oral reading passage to determine whether the subject has some prior knowledge about the content of the text. Although at times the subject may be asked to read silently, usually he or she reads the selected passage aloud while the researcher listens and marks down any miscues. The reading may also be timed to determine the rate of fluency. After the

subject reads, the researcher may ask him to retell what he remembers from the story. Next, she asks a series of comprehension questions about the given passage.

2.2.4.4 Qualitative Interview Questions Qualitative interview questions were used to gain additional insight into participants' attitudes about reading and possible sources of reading miscues. Questions were adapted from three sources: the Burke Interview Modified for Older Readers (BIMOR), RMA interview questions and the Concluding Interview questions.

Before the study, some participants completed the Burke Interview Modified for Older Readers (BIMOR) (Goodman, Watson, & Burke, 2005b) (see Appendix B) in written form. The BIMOR asks questions about readers' feelings and thoughts about reading, such as *Describe yourself as a reader* or *Who is a good reader that you know? What makes him/her a good reader?* During RMA, as readers listened to their audio-recorded readings with the researcher, adapted RMA interview questions (see Table 7) were used to guide a discussion about reading miscues (see Appendix C for the original RMA interview questions).

Table 7: RMA Interview Questions

1.	What does what you read mean?
2.	Did the story/article make sense?
3.	Did that miscue affect your understanding of the text?
4.	Does what you've read sound like language?
5.	Did you correct what you read?
6.	Why did you correct it? OR
7.	Why didn't you correct it?
8.	Should you have corrected it?
9.	Did what you read look like what is on the page?
10.	Did what you read sound like what is in the text?
11.	Why do you think you made that miscue?

Adaptations to the original questions were made to adjust for students' proficiency level, and, as recommended by Goodman and Marek (1996), the questions were not all asked in every situation, but rather the post-reading interview was a natural conversation guided by these questions. Students also completed the Concluding Interview questions (Goodman & Marek, 1996) (see Appendix D). These questions ask students to reflect on RMA sessions; for example, one of the questions is: *Do you have any different attitudes toward reading than you had at the beginning?*

2.2.4.5 Reading Miscue Inventory The Reading Miscue Inventory (RMI) is a tool designed by Goodman, Watson, and Burke (2005) to analyze readers' miscues. It is a coding system that is first applied to individual miscues and is then used to quantify miscue data in four areas: Meaning Construction, Grammatical Relations, Graphic Similarity and Sound Similarity. Figure 2 shows the coding of a single miscue from Marco's reading of *All Quiet on the Western Front* on 4/27/12. The word on the top is the miscue; the word on the bottom is the printed text.

Figure 2: Coding a Single Miscue with RMI

Marco's Miscue

0107 In Tjaden this is

this

0108 voracity, in Müller **it** is foresight.

RMI Coding of Marco's Miscue

1 Syntactic Acceptability	2 Semantic Acceptability	3 Meaning Change	4 Correction	Sec 2, 3, 4 Meaning Construction			Sec 1, 2, 4 Grammatical Relations				5 Graphic Similarity			6 Sound Similarity		
				No Loss	P Loss	Loss	S	PS	OC	W	H	S	N	H	S	N
Y	Y	N	N	√			√				√			√		

Each miscue receives a code of **Y** (Yes), **P** (Partial) or **N** (No) for Syntactic Acceptability (column 1), Semantic Acceptability (column 2), Meaning Change (column 3) and Correction (column 4). These codes together stipulate the scores received for Meaning Construction and Grammatical Relations. For example, the codes YNN (columns 2-4) above correspond to a score of "No loss" in Meaning Construction, and the codes YYN (columns 1, 2 and 4) correspond to a score of "Strength" in Grammatical Relations. Additional scores of **H** (High), **S** (Some) or **N** (No) are assigned for Graphic Similarity (column 5) and Sound Similarity (column 6) according to guidelines outlined extensively in Goodman, Waston, and Burke (2005, pp. 89-94).

Individual miscue scores, such as those above in Figure 2 are compiled on the Miscue Analysis In-Depth Procedure Coding Form (see Appendix E for the complete Miscue Analysis In-Depth Procedure Coding Form from Marco's first reading) to arrive at overall scores for the reading that are presented on the Miscue Analysis In-Depth Procedure Reader Profile. In Table 8, I have provided the Miscue Analysis In-Depth Procedure Reader Profile for Marco's first reading on 4/27/12 with explanations.

Table 8: RMI Chart with Explanations

	Reading 1	Explanations
Total Words	913	Total words read by the student in the passage
Total Miscues	60	Total number of miscues made in reading the passage
Miscues per Hundred Words (MPHW)	6.6	(Total Miscues ÷ Total Words) x 100 = Miscues per Hundred Words (MPHW)
Holistic Retelling	Good	Score for retelling after reading based on the rubric in Table 9
Meaning Construction		
No Loss	5(8%)	Percentage of miscues "coded as semantically acceptable with no meaning change or, if not acceptable, are corrected" (p. 152)[4]
Partial Loss	15(25%)	Percentage of miscues "coded either fully semantically acceptable with some meaning change or partially semantically acceptable" (p. 152)
Loss	40(67%)	Percentage of miscues "coded semantically unacceptable with no correction attempts or unsuccessful correction attempts, or the miscue is partially semantically acceptable with no attempt to correct" (p. 152)
Grammatical Relations		
Strength	6(10%)	Percentage of miscues "that are syntactically and semantically acceptable and, if not, are corrected" (p. 154)
Partial Strength	34(57%)	Percentage of miscues "that are syntactically acceptable, but not fully semantically acceptable, nor successfully corrected" (p. 154)
Overcorrection	0(0%)	Percentage of miscues "that are fully acceptable, both syntactically and semantically, and do not need correction, but the reader corrects" (p. 154)
Weakness	20(33%)	Percentage of miscues "that are not fully syntactically acceptable, nor semantically acceptable, nor successfully corrected" (p. 154)

[4] All page numbers in this table stem from Goodman, Watson and Burke (2005)

Graphic Similarity		
High	41(87%)	Percentage of miscues in which "[t]wo or more parts of the OR[5] look like two or more parts of the ER[6] and appear in the same location" (p. 91)
Some	3(6%)	Percentage of miscues in which "one part of the OR looks like one part of the ER and appears in the same location, or there is the same general configuration of the OR and ER and a letter in common" (p. 91)
None	3(6%)	Percentage of miscues in which "[n]o degree of graphic similarity exists between the OR and the ER (p. 91)
Sound Similarity		
High	36(77%)	Percentage of miscues in which "[t]wo parts of the OR sound like two parts of the ER and are heard in the same location (beginning, middle, or end)" (p. 93)
Some	8(17%)	Percentage of miscues in which "[o]ne part of the OR sounds like one part of the ER and is heard in the same location in both words" (p. 93)
None	3(6%)	Percentage of miscues in which "[t]here is no degree of sound similarity between the miscue and the text" (p. 93)

In the first row, the total number of words read by the subject is entered. In the second row, the total number of miscues made by the subject in reading that passage is entered. In the third row, the average number of miscues made per 100 words is calculated. In the fifth through seventh rows percentage scores for Meaning Construction are calculated. In the eighth through eleventh rows percentage scores for Grammatical Relations are calculated. In the twelfth through fourteenth rows Graphic Similarity is calculated. In addition to the general rules for calculating graphic similarity, which are stated in Table 8, there are some additional guidelines for coding Graphic Similarity. Miscues where "[t]he entire OR is found in the entire ER, or the entire ER is in the OR, but with the letters possibly not in the same order" (Goodman, Watson & Burke, 2005, p. 92) should also be scored **H**, and miscues where "[t]he OR and the ER have a letter or

[5] OR is an abbreviation for "observed response".
[6] ER is an abbreviation for "expected response".

letters in common, but they do not appear in the same position (beginning, middle, end), or they have similar length and configuration" (p. 92) should be scored **S**. In the fifteenth through seventeenth rows Sound Similarity is calculated. In addition to the general rule stated in Table 8, miscues in which "[t]he entire OR is heard in 50% of the ER, or the entire ER is heard in 50% of the OR" (p. 94) should be scored as **H** for Sound Similarity.

In the fourth row, a holistic score for the student's retelling of the passage is entered. Goodman and Marek (1996) recommend making a retelling guide to accompany the reading and to use in calculating a percentage score. Wurr, Theurer, and Kim (2008) modified this and provided a holistic retelling score. I tried both and found the holistic retelling score provided a more concise reflection of students' retelling. I opted for this procedure because I did not need to capture finer nuances in students' reading comprehension for this study. The rubric I used for the holistic retelling is displayed in Table 9.

Table 9: Holistic Retelling Rubric

Excellent	Good	Fair	Poor
Able to retell all major plot elements and specific details. Able to answer all follow-up questions correctly.	Able to retell all major plot elements and some specific details. Able to answer some follow-up questions correctly.	Able to retell all major plot elements but lacks detail. Cannot answer most follow up questions.	Not able to retell all major plot elements. Some details may be given but retelling is not a cohesive story. Unable to answer follow-up questions.

2.2.5 Procedure

This study used an 'n-of-one' design to address the methodological issues in previous RMA studies. In phase 1 of the study, a baseline was established for each

student. In phase 2, the analysis was conducted, and in phase 3 baseline measures were administered again to measure change. Each student was compared to him- or herself.

2.2.5.1 Phase 1: 3-Week Baseline At the start of the study, I looked at MEPA scores to identify students who would be deemed limited English proficient (LEP) by the state of Massachusetts and therefore considered ELLs. I administered a brief questionnaire (see Appendix A) to gather information about their home literacy experiences and motivational factors that have been shown to affect students' language acquisition and literacy development.

Since the most recent MEPA scores for some students measured their performance 8-12 months before the RMA treatment began, I also administered the MELA-O (2010) and PPVT-4 (2007) to establish a baseline measure of students' oral English proficiency and English vocabulary knowledge at the beginning of the treatment. Then, over three weeks, I established a baseline of students' reading skills, including reading level, fluency, types of miscues and text comprehension. This was done with leveled reading passages from the QRI-5 (Leslie & Caldwell, 2011) and the RMI (Goodman, Watson, & Burke, 2005).

In order to administer the QRI-5, students first read graded word lists of 20 words to establish the reading level at which they read words in isolation at the instructional and frustration levels. As recommended in the QRI-5 protocol, McCracken's (1966) criteria were used to gauge reading level from word reading in isolation (see Table 10). If a student reads at least 18 words on a grade-level list correctly, the student reads words at

that level independently. Fourteen to 17 words read correctly indicates instructional level, and fewer than 14 words correct indicates frustration level. This information is then used to determine the text level the subject should begin with to determine reading level for connected text.

Table 10: Guidelines for Determining Reading Level from Isolated Word Lists

Independent	Total Correct:	90% and above	18-20 words
Instructional	Total Correct:	70%-85%	14-17 words
Frustration	Total Correct:	Less than 70%	13 words or less

Subjects next read graded passages of connected text at the instructional level established on the isolated word lists. My goal was to have students read one leveled passage from the QRI-5 each week for three weeks to establish a baseline. In most cases I was able to do this, but some participants had absences or academic demands that prevented me from administering all three passages.

Administration of the QRI-5 reading passages includes assessment before, during and after reading of the text. Before the subject reads the text, prior knowledge of the topic is assessed, as prior knowledge affects a reader's comprehension of text. Research done on the QRI-5 has found that most students who score 55% or higher on prior knowledge questions score higher than 70% on passage comprehension questions (Leslie & Caldwell, 2011). The QRI-5 administrator asks three to five prior knowledge questions before the subject reads the passage and scores the reader's answers from zero to three according to the following scoring system.

The subject earns three points for a precise definition, or a definitional response to a phrase, or an answer to a question specifically related to passage content, or a synonym.

For example, in response to the question: "Why do people work?" the answer: "to get money for their families" would earn three points (Leslie & Caldwell, 2011, p. 49).

The subject earns two points for an example of the concept, or a specific attribute or defining characteristics, or a function. For example, in response to the question: "What is working at home?" the answer: "cleaning house, washing dishes" would earn two points (Leslie & Caldwell, 2011, p. 49).

The reader earns one point for a general association, or isolation of prefix, suffix, or root word, or firsthand, personal association. For example, in response to the question: "What does 'going to work' mean to you?" the answer "leaving the house" would earn one point (Leslie & Caldwell, 2011, p. 50).

A reader earns 0 points for sound-alikes, or unconnected responses, or no response, or "I don't know."

In order to account for the way in which prior knowledge affects reading comprehension, I tried to use both familiar and unfamiliar texts with students. This was challenging as language proficiency presented a confounding variable. Monolingual native speakers of a language are more likely to know the words for concepts they understand and the concepts for words they know than nonnative speakers, who may understand concepts and know the words for them in their native language but not in the new language they are acquiring. I will discuss this further in Chapter 3. In all cases except one, I also administered both narrative and expository texts at grade level to gain an accurate picture of each student's reading level. One student was unable to complete more than one trial due to absences.

While the students read passages aloud I made an audio recording and concurrently recorded miscues (substitutions, omissions and insertions). As stipulated in the QRI-5 protocol: "Variations in pronunciations due to articulation difficulties or regional dialects [were] not counted as oral reading miscues unless the student [had] been observed to pronounce the word or word part correctly" (Leslie & Caldwell, 2011, p. 63).

Immediately after the passage was read, I asked the student to answer the comprehension questions based on passage content. The QRI-5 gives the researcher the option of removing the passage for this part of the assessment (no look-backs), or allowing look-backs. I allowed the subjects to use look-backs because adolescent ELLs may experience greater taxation on short-term memory than monolingual English readers in the same age group. Research has found that both literacy and language acquisition place demands on working memory (Baddeley, 1993; Baddeley, Papagno, & Vallar, 1988; Gathercole & Baddeley, 1993; Service & Craik, 1993), and working memory is employed to a lesser extent when readers begin to depend on print and conceptual strength (Gathercole, 1992; Hulme, Thomson, Muir, & Lawrence, 1981) and when second language proficiency increases (Cheung, 1996). I wanted to maximize subjects' chances to demonstrate comprehension and therefore allowed look-backs because I believed it would reduce taxation on short-term memory. The number of correct answers to comprehension questions was counted to determine the student's reading level for comprehension.

Miscues were next counted to determine the student's reading level for word identification in context (see Table 11 for determination of reading level based on word

reading in context). The student's reading level was determined using Total Accuracy. Total Acceptability was also calculated for comparison. In Total Accuracy, all of the student's miscues, whether they change the meaning of the text or not, are used to determine the student's reading level. In Total Accuracy a distinction is made between miscues that change meaning and miscues that do not change meaning. For example, in Total Accuracy reading "like" instead of "likes" in the sentence: "He likes chocolate" would count as a miscue. In Total Acceptability, this miscue would not count as a miscue because it does not change the meaning of the sentence.

Table 11: Determining Reading Level by Word Reading in a Passage (adapted from Leslie & Caldwell, 2011)

Level	**Total Accuracy**	**Level**	**Total Acceptability**
Independent Level:	98% accuracy	Independent Level:	98% Total Accuracy
Instructional Level:	90-97% accuracy	Instructional Level:	95-97% Total Accuracy
Frustration Level:	less than 90% accuracy	Frustration Level:	less than 94% Total Accuracy

Since a student's reading level on the QRI-5 is determined by looking at both word identification (WR) and comprehension (Comp) of the text, the scores for these two component parts are taken into account in the total passage level score (as seen in Table 12). If the word identification (WR) score indicates independent level reading and the comprehension (Comp) score also indicates independent level, the total passage level score is independent level. If the WR score indicates independent level reading and the Comp score indicates instructional level, the total passage level score is instructional level, etc.

Table 12: Determining Total Passage Level on the QRI-5 (Leslie & Caldwell, 2011, p. 58)

Word Reading: Independent	+ Comp: Independent	= Independent Level
	+ Comp: Instructional	= Instructional Level
	+ Comp: Frustration	= Frustration Level
Word Reading: Instructional	+ Comp: Independent	= Instructional Level
	+ Comp: Instructional	= Instructional Level
	+ Comp: Frustration	= Frustration Level
Word Reading: Frustration	+ Comp: Independent	= Frustration Level
	+ Comp: Instructional	= Frustration Level

Fluency was calculated after the reading using the audio recording. The following formula was used to determine fluency: Correct Words Per Minute (CWPM) = ((number of words in the passage – miscues) x 60) ÷ number of seconds it took to read the passage.

I also used the audio recording to code miscues with the RMI coding procedures (Goodman, Watson, & Burke, 2005).

The information from this baseline testing was used to establish each student's baseline reading level and also to select an appropriate level text for use in RMA sessions.

2.2.5.2 Phase 2: 6-8 Week RMA Procedure Over the course of six to eight weeks, I provided four sessions of RMA. Each student was audio recorded while reading a text at an appropriate reading level. A week after the recording, the researcher and the participant replayed the recording and analyzed the miscues made by the reader together. At this time a new passage was also read and recorded for analysis the following week. As outlined in RMA, initially I guided the reader to answer questions about miscues. As

the reader gained experience I allowed him/her to help guide the analysis of miscues.

When possible, the four passages for RMA in this study were taken from leveled readers of adapted classics that matched the students' reading levels as established in baseline testing. Students read a new chapter from the same book each time we met. This was an important methodological adjustment to other studies of RMA that had not used leveled readers. The leveled readers allowed me to better gauge students' reading performance over time, since the level of the text remained consistent. One student, Marco, scored too high on baseline measures to read an adapted reader at an instructional level, and one student, Bao-yu, read two chapters from a text that was not leveled. Students were given a selection of books to choose from. The RMA was performed approximately once a week for a total of four times with each participant in this phase. Six to eight weeks were allotted for RMA sessions, since absences, schoolwork and school vacations occasionally interrupted a weekly session.

During the RMA reading, the student read aloud from the text into an audio recorder. I instructed the reader to read as if I was not there, and I provided no assistance in passage comprehension or word decoding. Students were "encouraged to read as if they [were] reading alone" (Goodman, Watson, & Burke, 2005, p. 53). When students asked me what a word meant or how to pronounce a word, I explained that they should do whatever they would do if I wasn't there or replied: "What do you think it means?" or "Just do the best you can." After the session, I listened again to the recorded reading and noted miscues I wanted to discuss. The following week, the student and I listened to the recording and discussed the miscues they heard. Sometimes I prompted students to

identify miscues themselves. We discussed approximately five miscues per session, and these discussions were audio recorded. After the discussion, we read another section of text to listen to and discuss the following week.

2.2.5.3 Phase 3: Post-RMA Procedure Testing After four sessions of RMA, students were retested with each of the baseline measures (the MELA-O, the PPVT, and the QRI-5). Students also completed the Concluding Interview (Goodman & Marek, 1996).

2.2.6 Data Analysis

This study produced both quantitative and qualitative data; however, the number of participants in the study, though larger than the sample of most other RMA studies (Almazroui, 2007; Kabuto, 2009; Marek, 1987; Wurr, Theurer, & Kim, 2008), was small. To ensure validity, I therefore collected and analyzed data in a variety of ways, according to the strategy of methods triangulation (Patton, 2002). Although not a sociological study, this work followed Denzin's (1989) theory that: "By combining multiple observers, theories, methods, and data sources, sociologists can hope to overcome the intrinsic bias that comes from single-methods, single-observer, and single-theory studies" (p. 307).

RMA was evaluated in four ways. I first calculated number and type of miscues across the four readings using the Retrospective Miscue Inventory (RMI) in-depth procedure (Goodman, Watson, & Burke, 2005). Next, I compared the baseline and post-

test data from the QRI-5 to determine if there were changes in individuals' a) decoding accuracy, determined by number of miscues per 100 words, b) comprehension level, determined by QRI-5 passage comprehension questions or c) fluency scores, determined by baseline and post-test correct words read per minute (CWPM) on the QRI-5. Third, I analyzed decoding accuracy and fluency for each RMA reading using the same formulas I had used on the QRI-5 passages. Finally, I looked at students' Concluding Interview (Goodman & Marek, 1996) questions to learn how they felt about RMA.

2.3 Results

In this section, I first look at individual students as case studies. This analysis is followed by more global conclusions about the RMA approach.

2.3.1 Ana

Ana was a student new to Schoenberg High School from Bulgaria the year before the study began. She scored a 2 out of 5 on the MEPA assessment of English language proficiency the fall before the RMA sessions started, and her MELA-O score at the beginning of the RMA sessions was a 3 out of 5 for comprehension and a 10 out of 20 for production. She characterized herself as someone who was usually motivated to learn English and who sometimes worked hard in school. When asked what she did when she came to something that gave her trouble in reading, she responded that she would ask someone and try to learn it. When asked how she would help someone who was having

difficulty reading, she wrote "I will read and explaind what the person doesn't know."[7] She also felt that a teacher would "explain words that the person doesn't know" to help that person. When asked if there was anything she wanted to change about her reading, she wrote "I wan't to change my prounance to be better and read good."

After administering the QRI-5, I found that Ana's instructional reading level in English was third grade. She selected an adapted version of the *Odyssey* (Homer, 1999) to read for the RMA sessions. In Reading 1, she read a chapter from one version of the text, and we switched to chapters in another adapted version for the final three readings, since Ana struggled to read and comprehend the first version.

As I read with Ana, it was apparent that she had many gaps in her English vocabulary. She often asked me what words in the text meant, and in her interview before the RMA sessions she had said a teacher could help students with reading by "explain[ing] words that the person doesn't know." Hearing this in the interview, I wondered if Ana was depending too much on help from others and the dictionary rather than metalinguistic awareness and context to understand unknown words she encountered. Jiménez, Gracía, and Pearson's (1996) study of bilingual readers found that "successful Latina/o readers used a variety of techniques to construct working definitions of unknown vocabulary such as using context, invoking relevant prior knowledge, questioning, inferencing, searching for cognates, and translating" (p. 100). But when reading with Ana I felt that if I had been able to provide some definitions or a bilingual dictionary it would probably have helped her to understand more of what we

[7] All errors in student writing and speaking were retained.

were reading.

I first analyzed Ana's progress with RMA by completing a RMI (Goodman, Watson, & Burke 2005) as outlined in the RMA procedures (Goodman & Marek, 1996). Table 13 shows Ana's RMI scores.

Table 13: Ana's RMI Scores Across Four RMA Sessions

	Reading 1	Reading 2	Reading 3	Reading 4
Total Words	449	975	691	603
Total Miscues	30	37	31	26
MPHW	6.7	3.8	4.5	4.3
Holistic Retelling	Fair	Good	Poor	Poor
Meaning Construction				
No Loss	11(37%)	9(24%)	13(42%)	7(27%)
Partial Loss	3(10%)	4(11%)	4(13%)	2(8%)
Loss	16(53%)	24(65%)	14(45%)	17(65%)
Grammatical Relations				
Strength	11(37%)	9(24%)	11(35%)	3(12%)
Partial Strength	12(40%)	25(68%)	12(39%)	17(65%)
Overcorrection	1(3%)	1(3%)	3(10%)	4(15%)
Weakness	6(20%)	2(5%)	5(16%)	2(8%)
Graphic Similarity				
High	29(100%)	33(94%)	25(93%)	19(90%)
Some	0(0%)	1(3%)	2(7%)	2(10%)
None	0(0%)	1(3%)	0(0%)	0(0%)
Sound Similarity				
High	27(93%)	33(94%)	23(85%)	17(81%)
Some	1(3%)	0(0%)	2(7%)	2(10%)
None	1(3%)	2(6%)	2(7%)	2(10%)

As can be seen in Ana's RMI scores, the number of miscues she made remained consistent across the second, third and fourth readings, which were done with different chapters of the same adaptation of the text. There were fluctuations in scores for Meaning Construction and Grammatical Relations, but no notable improvement across the reading sessions. In Ana's scores for Sound Similarity, there is a small indication that

she relied less on sound relations in reading words as time went on.

I next analyzed Ana's fluency scores and decoding accuracy for each of the final three reading sessions to determine if she had improved in these areas. I did not include Reading 1 because it had been done with a different adaptation of the *Odyssey*. Ana's fluency scores in Reading 2, Reading 3 and Reading 4 were 68 correct words per minute (CWPM), 71 CWPM, and 61 CWPM respectively. These scores indicate no improvement in fluency. Ana's decoding accuracy, as measured by number of miscues per 100 words (MPHW), across the three reading sessions was 3.8, 4.5 and 4.3 respectively. These scores indicate no improvement in overall decoding accuracy.

I also compared Ana's pre- and post-test scores to see if there was improvement on those measures. Ana's PPVT-4 score was 44 when she started RMA and 42 at the end of the RMA sessions. Her instructional level on the QRI-5 improved to fourth grade from third grade. Her MELA-O scores stayed the same for comprehension (3) and improved for production from a 10 to a 13. These scores suggest that Ana's overall reading and English proficiency may have improved over the course of the RMA sessions.

In her Closing Interview (Goodman & Marek, 1996), Ana wrote "I think I am better than before" and "it's more easy to understand the meanings now." In general, when asked about the RMA sessions we spent together, she said "It is good time, when I understand the what I actually read." These comments suggest that Ana perceived improvement in her reading comprehension but still felt vocabulary gaps impeded her comprehension.

2.3.2 Marco

Marco was a student new to Schoenberg High School from Bulgaria the month before the study began. Before enrolling at Schoenberg High School, he had attended another American high school for three months, so he had been in the country for eight months. He scored a 5 out of 5 on the MEPA assessment of English language proficiency the fall before RMA started, and his MELA-O score at the beginning of the RMA sessions was a 4 out of 5 for comprehension and a 16 out of 20 for production. He characterized himself as someone who was usually motivated to learn English and who usually worked hard in school. When asked what he did when he came to something that gave him trouble in reading, he responded that he would ask somebody for help. When asked who was a good reader he knew, he wrote "The one who can create an ilustration of the book in his head. My sister." When asked how he would help someone who was having difficulty reading, he responded "I would read it and try to help him." He felt that a teacher "would try to explain it" to help that person. When asked to describe himself as a reader, he responded "I'm not a good reader, I preffer movies."

After administering the QRI-5, I found that Marco's instructional reading level in English was high school. He selected an English translation of the original German text *All Quiet on the Western Front* (Remarque, 1929) to read for the RMA sessions because he already knew the story.

As I read with Marco, I was struck by his understanding of complex text. We often read texts about war, including two QRI passages about the Vietnam War, a QRI passage about World War II and the text he selected for RMA. He had a mature attitude

about these topics and noticeable background knowledge and interest. His miscue patterns did not look like the other Cyrillic readers' (as will be discussed in Chapter 4), and, despite his high level of comprehension, he did not feel he was a good reader.

I analyzed Marco's progress with RMA first by completing a RMI (Goodman, Watson, & Burke 2005) as outlined in the RMA procedures (Goodman & Marek, 1996). Table 14 shows Marco's RMI scores for the four readings.

Table 14: Marco's RMI Scores Across Four RMA Sessions

	Reading 1	Reading 2	Reading 3	Reading 4
Total Words	913	2,359	769	1,879
Total Miscues	60	103	35	82
MPHW	6.6	4.3	4.6	4.4
Holistic Retelling	Good	Good	Good	Good
Meaning Construction				
No Loss	5(8%)	27(27%)	6(17%)	26(32%)
Partial Loss	15(25%)	10(10%)	5(14%)	12(15%)
Loss	40(67%)	64(63%)	23(66%)	44(54%)
Grammatical Relations				
Strength	6(10%)	26(26%)	7(20%)	27(33%)
Partial Strength	34(57%)	45(45%)	18(51%)	41(50%)
Overcorrection	0(0%)	1(1%)	0(0%)	2(2%)
Weakness	20(33%)	29(29%)	10(29%)	12(15%)
Graphic Similarity				
High	41(87%)	72(83%)	29(88%)	68(88%)
Some	3(6%)	10(11%)	2(6%)	4(5%)
None	3(6%)	5(6%)	0(%)	5(6%)
Sound Similarity				
High	36(77%)	64(74%)	25(76%)	62(81%)
Some	8(17%)	13(15%)	5(15%)	11(14%)
None	3(6%)	10(11%)	1(3%)	4(5%)

As can be seen in Marco's RMI scores, the number of miscues he made decreased after the first reading and remained consistent across the three subsequent readings. There was also some improvement in scores for Meaning Construction and Grammatical

Relations. In Marco's fourth reading only 54% of his miscues resulted in loss of meaning (compared to 67%, 63%, and 66% in previous readings) and only 15% of miscues suggested weakness in grammatical relations (compared to 33%, 29% and 29% in previous readings).

I next analyzed Marco's fluency scores and decoding accuracy for each of the RMA reading sessions to determine if he had improved in these areas. Marco's fluency scores on Readings 1-4 were 78 correct words per minute (CWPM), 89 CWPM, 92 CWPM and 89 CWPM respectively. These scores suggest improvement in reading fluency after the first RMA reading but no additional improvement after that. Marco's decoding accuracy, as measured by number of miscues per 100 words (MPHW), across the three reading sessions was 6.6, 4.3, 4.6 and 4.4 respectively. These scores also suggest improvement after the first reading but consistent decoding accuracy after that.

I also compared Marco's pre- and post-test scores to see if there was improvement on those measures. Marco's PPVT-4 score was 78 when he started the RMA and 76 at the end of the RMA sessions. His instructional level on the QRI-5 remained high school after the RMA sessions. His MELA-O scores improved from a 4 to a 5 for comprehension and stayed the same for production (16 out of 20). These scores suggest that Marco's English proficiency increased over the course of the RMA sessions.

In his Closing Interview (Goodman & Marek, 1996), Marco wrote "I understand the meaning of the book a little bit better." In general, when asked about the sessions we spent together, he wrote "Very helpful."

2.3.3 Bat

Bat was a student new to Schoenberg High School from Mongolia the fall before the study began. He scored a 1 out of 5 on the MEPA assessment of English language proficiency on the fall MEPA, and his MELA-O score at the beginning of the spring RMA treatment was a 3 out of 5 for comprehension and an 8 out of 20 for production. He characterized himself as someone who was usually motivated to learn English and usually worked hard in school.

After administering the QRI-5, I found that Bat's frustration reading level in English was third grade. Due to his absences, I was not able to give Bat an additional passage to read at instructional level before we started RMA. He selected an adapted version of the *The Phantom of the Opera* (Leroux, 1999) to read for the RMA sessions.

As I read with Bat, I noticed his prosody was very strong. In some places, he read over commas or periods, but in most cases, he read with appropriate intonation contours. Although he had a very hard time discussing why he might have made certain miscues and occasionally misunderstood the main idea of the text, he demonstrated the ability to make guesses about the story. For example, in reading *The Phantom of the Opera* (Leroux, 1999), he guessed that Christina loved the ghost (the phantom). Although this is not implied in the text, it is a reasonable guess, since Raoul is jealous of the ghost. This kind of guessing outside of what is implied in the text is not uncommon for other readers Bat's age, who are reading in their native language, and it demonstrates engagement with the story.

I analyzed Bat's progress with RMA first by completing a RMI (Goodman,

Watson, & Burke, 2005) as outlined in the RMA procedures (Goodman & Marek, 1996). Table 15 shows Bat's RMI scores for the four RMA readings.

Table 15: Bat's RMI Scores Across Four RMA Sessions

	Reading 1	Reading 2	Reading 3	Reading 4
Total Words	1,095	1,331	827	1,279
Total Miscues	45	61	18	25
MPHW	4.1	4.6	2.2	2.0
Holistic Retelling	Poor	Fair	Fair	Good
Meaning Construction				
No Loss	24(53%)	23(38%)	7(39%)	10(40%)
Partial Loss	3(7%)	5(8%)	1(6%)	1(25%)
Loss	18(40%)	33(54%)	10(56%)	14(56%)
Grammatical Relations				
Strength	22(49%)	23(38%)	8(44%)	9(36%)
Partial Strength	16(36%)	27(44%)	7(39%)	11(44%)
Overcorrection	3(7%)	1(2%)	0(0%)	1(4%)
Weakness	4(9%)	10(16%)	3(17%)	4(16%)
Graphic Similarity				
High	41(100%)	52(98%)	12(92%)	95(%)
Some	0(0%)	0(0%)	1(8%)	0(0%)
None	0(0%)	1(2%)	0(0%)	1(5%)
Sound Similarity				
High	39(95%)	49(92%)	12(92%)	20(95%)
Some	2(5%)	3(6%)	1(8%)	0(0%)
None	0(0%)	1(2%)	0(0%)	1(5%)

As can be seen in Bat's RMI scores, the number of miscues he made decreased after the second reading, and there was some fluctuation but no notable improvement in scores for Meaning Construction and Grammatical Relations. There was no change in Bat's use of Graphic or Sound Similarity across the four readings.

I next analyzed Bat's fluency scores and decoding accuracy for each of the reading sessions, to determine if he had improved in these areas. Bat's fluency scores in Readings 1-4 were 99 correct words per minute (CWPM), 102 CWPM, 112 CWPM and

123 CWPM respectively. These scores indicate consistent improvement in reading fluency over the course of the RMA sessions. Bat's decoding accuracy, as measured by number of miscues per 100 words (MPHW), across the three reading sessions was 4.1, 4.6, 2.2 and 2.0 respectively.

I also compared Bat's pre- and post-test scores to see if there was improvement on those measures. Bat's PPVT-4 score was 61 when he started RMA and 42 at the end of the RMA sessions. His reading of a third grade level text on the QRI-5 was scored as instructional rather than frustration after the RMA sessions. His MELA-O scores stayed the same for comprehension (a 3 out of 5) and increased from an 8 to a 9 out of 20 for production. These results suggest that Bat's fluency and decoding skills may have improved during the RMA sessions, though comprehension scores show less improvement.

In his Closing Interview (Goodman & Marek, 1996), Bat said "I can improve my English, better than first time, I so many things I know." When asked about himself as a reader he said "I can't read not very well and now I can read very well. A little bit clean, my accent is better." In general, when asked about the sessions we spent together, he said "Very helpful. I need those things." Bat's interview suggests he too perceived improvements in his fluency and decoding accuracy as well as in his English proficiency as a result of RMA.

2.3.4 Bao-yu

Bao-yu was a student new to Schoenberg High School from China the fall before

the study began. She scored a 3 out of 5 on the fall MEPA assessment of English language proficiency, and her MELA-O score at the beginning of the spring RMA treatment was a 4 out of 5 for comprehension and a 12 out of 20 for production. She characterized herself as someone who was always motivated to learn English and always worked hard in school.

After administering the QRI-5, I found that Bao-yu's instructional reading level in English was fourth grade. She first selected an adapted version of *Jane Eyre* (Brontë, 1986) to read for the RMA sessions because she had seen the movie and switched to the original version of *Catching Fire* (Collins, 2009) after the first two sessions. Both of these texts were above her instructional level as indicated by Total Acceptability scores on the QRI-5, but I allowed her to select them since a) her comprehension scores on the QRI-5 were much higher than her decoding scores, b) she demonstrated good comprehension of the selected texts in retelling activities and c) she was motivated to read them.

As I read with Bao-yu, I was struck by her high frequency of miscues and how that did not seem to impede her comprehension of the text she was reading. For example, when she did not know a word, she occasionally said "blah blah" and moved on. One time, she came to the word "portfolio" and read it incorrectly numerous times but told me she knew what it was: "I know it's a binder. You put drawing in it..."

I analyzed Bao-yu's progress with RMA first by completing a RMI (Goodman, Watson, & Burke, 2005) as outlined in the RMA procedures (Goodman & Marek, 1996). Table 16 shows Bao-yu's RMI scores for the four readings.

Table 16: Bao-yu's RMI Scores Across Four RMA Sessions

	Reading 1	Reading 2	Reading 3	Reading 4
Total Words	1,351	534	1,025	730
Total Miscues	165	57	138	82
MPHW	12.0	10.7	13.4	11.2
Holistic Retelling	Good	Excellent	Good	Fair
Meaning Construction				
No Loss	51(31%)	21(38%)	25(18%)	15(19%)
Partial Loss	32(20%)	8(26%)	33(24%)	23(29%)
Loss	78(48%)	26(47%)	79(58%)	42(53%)
Grammatical Relations				
Strength	52(31%)	19(35%)	25(18%)	15(19%)
Partial Strength	52(31%)	25(45%)	63(46%)	44(55%)
Overcorrection	4(2%)	2(4%)	0(0%)	2(3%)
Weakness	53(32%)	9(16%)	48(35%)	19(24%)
Graphic Similarity				
High	130(90%)	47(94%)	116(94%)	65(88%)
Some	8(6%)	2(4%)	5(4%)	6(8%)
None	7(5%)	1(2%)	3(2%)	3(4%)
Sound Similarity				
High	110(76%)	37(74%)	107(86%)	56(76%)
Some	25(17%)	10(20%)	12(10%)	12(16%)
None	10(7%)	3(6%)	5(4%)	6(8%)

As can be seen in Bao-yu's RMI scores, the number of miscues she made across the four readings fluctuated (12, 10.7, 13.4, 11.2 MPHW, respectively) but did not appear to decrease. Readings 1 and 2 were done with chapters from an adapted version of *Jane Eyre*, and Readings 3 and 4 were done with chapters from the original version of *Catching Fire*. There was no improvement in scores for either Meaning Construction or Grammatical Relations across the four reading sessions. Bao-yu's scores for Graphic and Sound Similarity also remain consistent.

I next analyzed Bao-yu's fluency scores and decoding accuracy for each of the reading sessions to determine if she had improved in these areas. Bao-yu's fluency

scores on Reading 1, Reading 2, Reading 3 and Reading 4 were 50 correct words per minute (CWPM), 54 CWPM, 56 CWPM and 102 CWPM respectively. These results show an increase in fluency on the final reading, but a decrease in comprehension was also evident on that reading. This may indicate that Bao-yu rushed to read the text quickly and sacrificed her comprehension of it in doing so. Bao-yu's decoding accuracy scores, as measured by number of miscues per 100 words (MPHW), across the reading sessions were 12.0, 10.7, 13.4 and 11.2, as noted above, and demonstrate no improvement.

I also compared Bao-yu's pre- and post-test scores to see if there was improvement on those measures. Bao-yu's PPVT-4 score was 64 when she started RMA and 51 at the end of the RMA sessions. Her instructional level on the QRI-5 remained at fourth grade. Her MELA-O scores stayed the same for comprehension (a 4 out of 5) and increased from a 12 to a 16 out of 20 for production. This suggests Bao-yu's oral English proficiency may have improved during the RMA sessions.

In her Closing Interview (Goodman & Marek, 1996), Bao-yu wrote "I think it's great. I feel like I am talking to my friend and more like telling a story" and "In the beginning I more feel like to finished reading and I got community service time, but in the end I more feel like it's for fun." These comments suggest that Bao-yu's enjoyment of reading improved during the RMA sessions, since she describes her final impressions of the sessions as "like I am talking to my friend" and "like it's for fun" in contrast to initial feelings that she was participating in the sessions to earn required community service time or just to finish the reading.

Bao-yu also felt that she had improved her reading and wrote "In my normal reading (like at home) I am care-less before, but after this I found out I sometimes also like to read out loud in my heart when I am reading." She also commented on the sessions we spent together: "I think it's great, I think it's great the teacher won't stop me when I read wrong words. The way teacher do this helps a lot." This suggests that the RMA sessions changed the way Bao-yu read on her own time and also that the opportunity to read with a teacher without being corrected seemed helpful to her.

2.3.5 Lan

Lan was a student new to Schoenberg High School from China the year before the study began. She scored a 3 out of 5 on the fall administration of the MEPA assessment of English language proficiency, and her MELA-O score at the beginning of the spring RMA treatment was a 3 out of 5 for comprehension and a 12 out of 20 for production. She characterized herself as someone who was always motivated to learn English and usually worked hard in school.

After administering the QRI-5, I found that Lan's instructional reading level in English was fourth grade. She selected an adapted version of *A Christmas Carol* (Dickens, 1999) to read for the RMA sessions.

As I read with Lan, she struck me as hesitant and very sensitive to differences between her reading and the English text. In addition to a very low number of miscues per 100 words (1.6, 2.2, 1.4, and 1.5 across the four readings) compared to other ELL readers, she also corrected many of her miscues. In Reading 4, for example, she

corrected 11 of her 21 miscues (52%). She read with remarkable precision and did an excellent job retelling what she had read.

I analyzed Lan's progress with RMA first by completing a RMI (Goodman, Watson, & Burke, 2005) as outlined in the RMA procedures (Goodman & Marek, 1996). Table 17 shows Lan's RMI scores for the four readings.

Table 17: Lan's RMI Scores Across Four RMA Sessions

	Reading 1	Reading 2	Reading 3	Reading 4
Total Words	1,510	1,614	1,483	1,432
Total Miscues	24	37	21	21
MPHW	1.6	2.2	1.4	1.5
Holistic Retelling	Excellent	--[8]	Good	Excellent
Meaning Construction				
No Loss	8(33%)	23(64%)	12(57%)	13(62%)
Partial Loss	4(17%)	5(14%)	1(5%)	2(10%)
Loss	12(50%)	8(22%)	8(38%)	6(29%)
Grammatical Relations				
Strength	6(25%)	21(58%)	11(52%)	11(52%)
Partial Strength	9(38%)	4(11%)	8(38%)	3(14%)
Overcorrection	2(8%)	5(14%)	1(5%)	2(10%)
Weakness	7(29%)	6(17%)	1(5%)	5(24%)
Graphic Similarity				
High	19(95%)	20(80%)	16(76%)	13(81%)
Some	1(5%)	1(4%)	2(11%)	1(6%)
None	0(0%)	4(16%)	0(0%)	1(6%)
Sound Similarity				
High	17(85%)	17(68%)	13(72%)	9(56%)
Some	2(10%)	4(16%)	3(18%)	4(25%)
None	1(5%)	4(16%)	2(11%)	2(13%)

As can be seen in Lan's RMI scores, the number of miscues she made remained consistent across the four readings. There were slight improvements in scores for both

[8] Lan did not retell after this reading because we ran out of time and she needed to go to her next class.

Meaning Construction and Grammatical Relations after the first session, but no notable improvements across the final three reading sessions. Lan's scores for Graphic and Sound Similarity suggest that she relied less on graphic and sound relations in reading words as time went on.

I next analyzed Lan's fluency scores and decoding accuracy for each of the reading sessions to determine if she had improved in these areas. Lan's fluency scores in Reading 1, Reading 2, Reading 3 and Reading 4 were 96 correct words per minute (CWPM), 111 CWPM, 104 CWPM and 116 CWPM respectively. These scores suggest that her fluency improved a small amount across the four readings. Lan's decoding accuracy, as measured by number of miscues per 100 words (MPHW), across the reading sessions was 1.6, 2.2, 1.4 and 1.5 respectively. These scores do not indicate improvement in decoding accuracy.

I also compared Lan's pre- and post-test scores to see if there was improvement on those measures. Lan's PPVT-4 score was 58 when she started RMA and 42 at the end of the sessions. Her instructional level on the QRI-5 remained at fourth grade. Her MELA-O scores improved from a 3 to a 4 out of 5 for comprehension and stayed the same for production (a 12 out of 20). These scores suggest that Lan's English proficiency may have improved during the time RMA took place.

In her Closing Interview (Goodman & Marek, 1996), Lan said "In the beginning I was just want to learn vocabularies, but in the end, I was like enjoying the story" and described the changes in her reading as "More accurate and faster." When asked how she felt about her ability to keep improving her reading, she said "You taught me how to read

books so whenever I read books I can like do like what you teach me and it will improve more and more." These comments suggest that Lan perceived improvements in her decoding accuracy and fluency, although the QRI-5 and RMI data only show improvement in fluency.

2.3.6 Eiko

Eiko was a student new to Schoenberg High School from Japan two years before the study began. She scored a 5 out of 5 on the MEPA assessment of English language proficiency the spring the RMA sessions started, and her MELA-O score at the beginning of the RMA sessions was a 4 out of 5 for comprehension and a 16 out of 20 for production. When I asked her what she did when she came to something that gave her trouble in reading, she responded that she would "look up some words to guess what it says, or sometimes read out." When asked if there was anything she wanted to change about her reading, she responded "read more clear, fast." When asked to describe herself as a reader, she responded "cold- I do not like to 'share' the emotions characters have in the story." She also felt that she had "read a lot without really paying attention" so she could not name a special book or memorable thing she had read.

After administering the QRI-5, I found that Eiko's instructional reading level in English was upper middle school. She selected an adapted version of the *The Adventures of Huckleberry Finn* (Twain, 1999) to read for the RMA sessions because she knew she would need to read the original the following year.

As I read with Eiko, I realized that despite her clear reading and good comprehension, she did not appear to have positive feelings about reading or herself as a

reader. She felt she was a "cold" reader and couldn't name a book she had enjoyed. Her motivation for choosing the book she read for RMA was that she knew she would need to read the story later for school rather than personal interest in the story. When asked about her opinion as to whether she needed to correct reading miscues, her answers suggested that she viewed the text as right and her errors as wrong. She said she would change errors "Because I thought I did wrong" or "Cause it's not...the way it's supposed to be."

I analyzed Eiko's progress with RMA first by completing a RMI (Goodman, Watson, & Burke, 2005) as outlined in the RMA procedures (Goodman & Marek, 1996). Table 18 shows Eiko's RMI scores for the four readings.

Table 18: Eiko's RMI Scores Across Four RMA Sessions

	Reading 1	Reading 2	Reading 3	Reading 4
Total Words	1,357	768	1,128	1,347
Total Miscues	34	19	22	30
MPHW	2.5	2.5	2.0	2.2
Holistic Retelling	Good	Good	Good	Good
Meaning Construction				
No Loss	15(44%)	5(26%)	10(45%)	9(30%)
Partial Loss	3(9%)	5(26%)	2(9%)	4(13%)
Loss	16(47%)	9(47%)	10(45%)	17(57%)
Grammatical Relations				
Strength	15(44%)	4(21%)	10(45%)	8(27%)
Partial Strength	15(44%)	8(42%)	8(36%)	15(50%)
Overcorrection	0(0%)	1(5%)	0(0%)	1(3%)
Weakness	4(12%)	6(32%)	4(18%)	6(20%)
Graphic Similarity				
High	26(84%)	13(72%)	18(95%)	24(89%)
Some	3(10%)	4(22%)	1(5%)	2(7%)
None	2(6%)	1(6%)	0(0%)	1(4%)
Sound Similarity				
High	21(67%)	12(67%)	14(74%)	22(81%)
Some	6(19%)	3(17%)	4(21%)	3(11%)
None	4(13%)	3(17%)	1(5%)	2(7%)

As can be seen in Eiko's RMI scores, the number of miscues she made decreased slightly across the four readings, from 2.5 in Readings 1 and 2 to 2.0 and 2.2 in Readings 3 and 4. There was fluctuation in scores for Meaning Construction and Grammatical Relations, but no notable improvement across the reading sessions. Eiko's scores for Sound Similarity suggest that she relied more on sound relations in reading words as time went on.

I next analyzed Eiko's fluency scores and decoding accuracy for each of the reading sessions to determine if she had improved in these areas. Eiko's fluency scores in Reading 1, Reading 2, Reading 3 and Reading 4 were 116 correct words per minute (CWPM), 107 CWPM, 107 CWPM and 100 CWPM respectively. These scores indicate that Eiko's fluency decreased during the RMA sessions. Eiko's decoding accuracy, as measured by number of miscues per 100 words (MPHW), across the reading sessions was 2.5, 2.5, 2.0 and 2.2 respectively. As noted above, her decoding accuracy appears to have increased a small amount.

I also compared Eiko's pre- and post-test scores to see if there was improvement on those measures. Eiko's PPVT-4 score was 75 when she started RMA and 90 at the end. Her instructional level on the QRI-5 remained at upper middle school. Her MELA-O scores improved from a 4 to a 5 out of 5 for comprehension and stayed the same for production (a 16 out of 20). These measures suggest that Eiko's English vocabulary and overall oral English proficiency increased during the time of the RMA session.

In her Closing Interview (Goodman & Marek, 1996), Eiko gave herself a 5 out of 10 as a reader and said she felt "a little more confident" but "I don't think there were

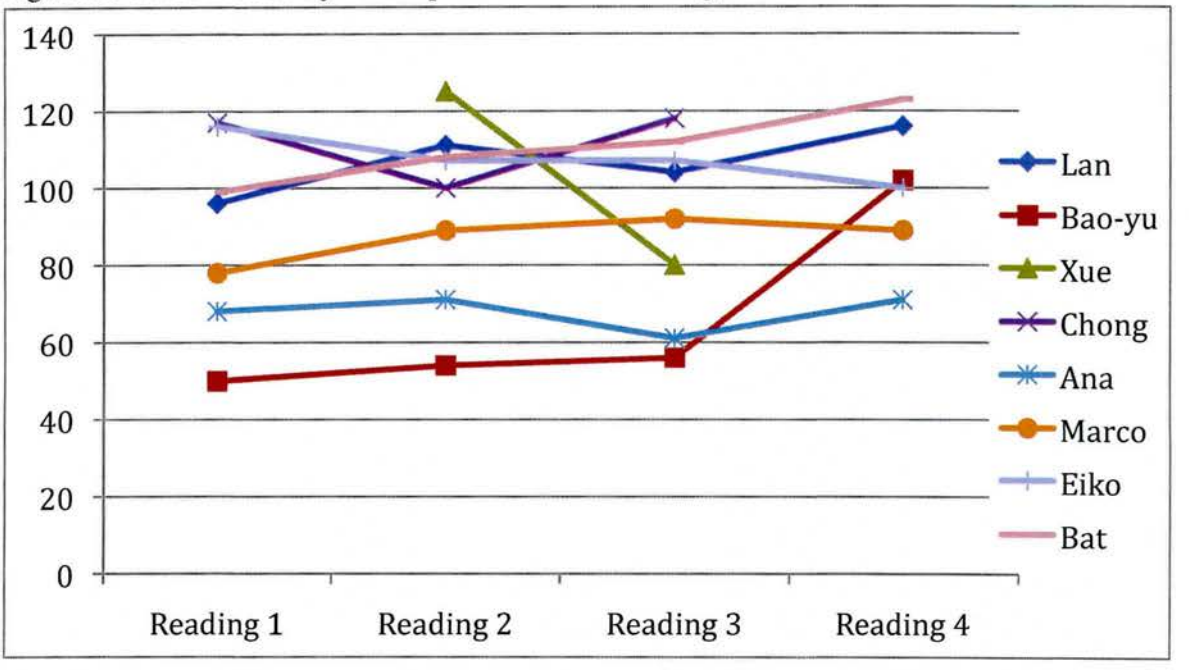
much changes." When asked how she felt about her ability to keep improving her reading, she wrote "not really enthusiastic...but I think I need to work on." This interview suggested to me that Eiko continued to have low self-esteem about her abilities as a reader and little enjoyment of reading.

2.3.7 Group Results

After looking at participants' individual results, I compiled the results for fluency, decoding accuracy, vocabulary and pre-and post-test reading comprehension scores to look for patterns across the group. Only six participants completed all four RMA sessions, but I have included some of the incomplete data from two other participants' RMA sessions. Due to the small number of participants, only qualitative observations can be made about these results.

Small improvements in fluency were observable for three of the four subjects (Lan, Bat, and Bao-yu) that completed all four sessions of RMA. The other five participants showed fluctuation or a decrease in fluency across RMA sessions (see Figure 3).

Figure 3: CWPM Read by Participants in Each Reading Session



I further explored these results by looking at pre- and post-test fluency scores on the QRI-5 for the six students who completed all four RMA sessions (See Table 19).

Table 19: Pre- and Post-RMA Fluency Scores in the QRI-5

	Ana	Marco	Bat	Bao-yu	Lan	Eiko
Pre-test	56*	95	102*	‡	77	114
Post-test	69 62*	90	122 121*	73	78	96

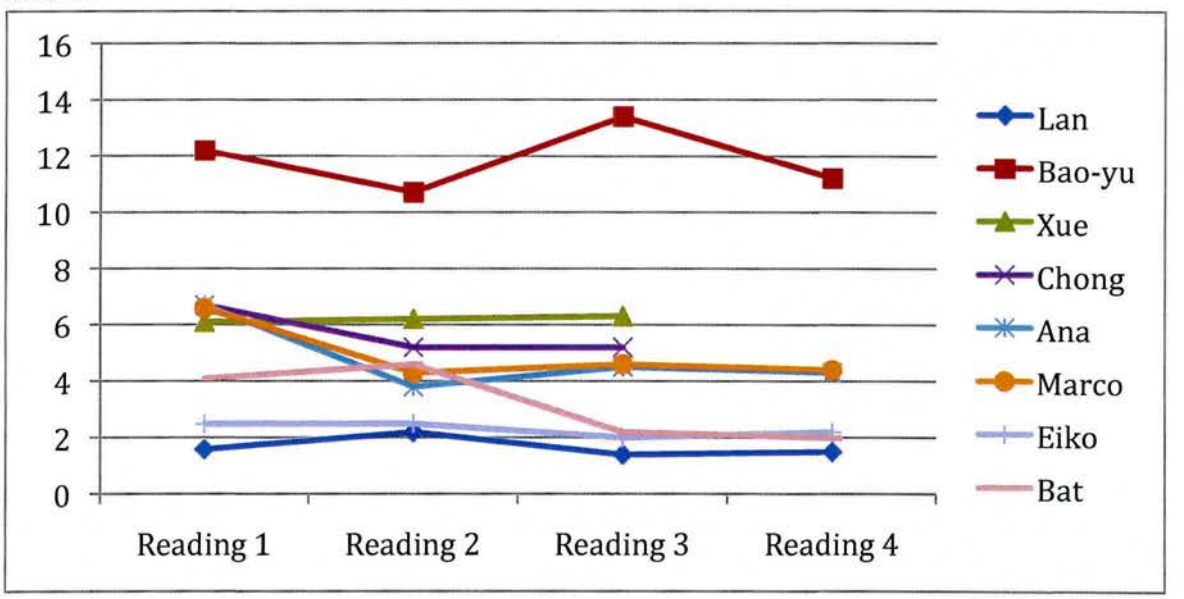
*These fluency scores originated from frustration level texts. In most cases I determined fluency using instructional level texts, but I did not have a pre-test fluency score on the QRI-5 with an instructional level text for Ana or Bat, so I provide these alternatives for comparison.

‡I could not calculate a fluency score for Bao-yu on a pre-test QRI because the readings she did were not audio recorded.

This measure showed improvement in fluency for Ana and Bat, but not for the other students, including Lan, whose fluency scores across the RMA readings showed small signs of improvement. Only Bat showed improvement in fluency on both measures.

I next looked at decoding accuracy as measured by number of miscues per 100 words. Improvements in decoding accuracy were seen for two subjects (Marco and Ana) after the first RMA session only and for one subject (Bat) over time (See Figure 4). It is important to note that Ana switched texts after the first reading.

Figure 4: Number of Miscues per 100 Words Read by Participants in Each Reading Session



I further explored these results by looking at pre- and post-test decoding accuracy scores on the QRI-5 for the six students who completed all four RMA sessions (see Table 20).

Table 20: Pre- and Post-RMA Miscues per 100 Words in the QRI-5

	Ana	Marco	Bat	Bao-yu	Lan	Eiko
Pre-test	5.0	4.0	6.3*	9.6	2.4	1.1

Post-test	3.6	3.0	1.9 Inst 3.0 Frus	10.0	1.8	2.8

*This text was read at frustration level. I was unable to give this participant an additional text at instructional level due to absences. For that reason, I have also provided a comparable score for a post-test frustration level reading. All other scores reflect instructional level texts for the respective readers.

The data from the QRI-5 also suggest that Marco, Bat and Ana may have improved in decoding accuracy after the RMA sessions. Lan also showed improvement on this measure, though her decoding accuracy scores on the RMA readings remained relatively consistent.

2.3.8 Sociocultural Factors

RMA is built on the belief that struggling readers are often too focused on how to decode and produce individual words exactly as they are printed than on the meaning created when they interact with a text. Such readers "also tend to look to the teacher to tell them what to do next" (Goodman & Marek, 1996, p. 16). RMA was designed with the hope that readers would be empowered as agents in the co-construction of meaning and come to view errors that don't change text meaning as strong and valid. The text or the teacher in this vision is no longer an ultimate authority on what is read or understood in the reading process.

In the field of second language acquisition (SLA), questions have also been posed about whether there is an ultimate authority for language production. Cook (1999) argues, for example, that maintaining the native speaker as the ultimate model for L2 learners is unfair because L2 users are by definition not native speakers and goes on to state: "L2 users should be treated as people in their own right, not as deficient native

speakers" (p. 195). This discussion admittedly differs from Goodman and Marek's (1996) above because it considers how groups of people are measured against each other, whereas Goodman and Marek consider the extent to which a *written text* should be considered a static authority. Yet, both discussions do revolve around the question of power and how disempowered individuals can be empowered in their learning. In the case of RMA, the goal is for readers (and teachers) to see readers' deviations from text as differences that may have value. In Cook's argument, the goal is for L2 users (or L2 teachers and researchers) to see L2 users' deviations from native speaker versions of the target language as differences that are no less valuable than native speaker productions.

These questions about authority and power may also be at play in L2 readers' error patterns and the extent to which they felt comfortable accepting their own productions when they differed from the printed word. Eiko's reflections on her miscue from 5/18/12 brought this to mind. She read 'everyone' instead of 'everybody' and corrected it:

c
|**everyone**

0721 They said that if |**everybody** didn't have

0722 a family to kill, it wouldn't be fair and square to

0723 the boys that did.

As Eiko's RMA reflections illustrate, she was reluctant to value her deviations from the text, even when her substitution was a synonym in her eyes, the eyes of a past teacher in Japan and the eyes of a native speaker:

Investigator: So what did you read the first time?
Eiko: Everyone.
Investigator: And then you corrected it.
Eiko: Mmm
Investigator: Why did you correct it?
Eiko: 'Cause I didn't read it right.
Investigator: And did it change the meaning?
Eiko: No.
Investigator: No. It was the exact same meaning. Do you think you needed to correct it?
Eiko: Yes.
Investigator: Why?
Eiko: 'Cause I read it wrong.
Investigator: Why do you think you read it wrong?
Eiko: It's a different word.
Investigator: Mhm. Why do you think you read the different word?
Eiko: I think because when I learned this word, my teacher told me it's the same as everyone, everybody.

As I considered this conversation, I questioned if discussing her oral reading errors with a native-speaking teacher made her self-conscious and/or overly cautious about her reading. Excessive caution could also explain the fact that her retelling scores remained consistent but her fluency scores decreased from 116 correct words per minute (CWPM) in her first reading (before RMA) to 107 CWPM in the second and third readings to 100 CWPM in her final reading. Did the analysis make her overly focused on reading correctly and slow her down as she tried to achieve complete fidelity to the text?

Although Goodman and Marek (1987) have studied struggling readers who exhibit this pattern, I question whether nonnative speakers may exhibit it not because they question themselves as readers but because they question themselves as nonnative speakers. Explaining the need for miscue correction by stating a miscue was nonnative

occurred in my RMA sessions with Ana. When Ana read the following excerpt, for example, she pronounced the –ed ending on the word "gushed":

/blud/ **/gʌʃId/**
1711 Blood **gushed** out, and
rɔrdId
rodId
1712 he roared and bellowed from the pain.

And afterward we discussed this miscue:

Investigator: Did it change your understanding of the text?
Ana: No.
Investigator: Do you think it was important to fix it?
Ana: Yeah.
Investigator: Why?
Ana: Because…I don't know, for me it's important.
Investigator: Why?
Ana: Because in English it's different…

Even though she felt her reading did not change the meaning, she still felt it was important to change what she had read "Because in English it's different." Lan expressed similar feelings when she read the following:

2815 They pushed
c
|
2816 chairs and desks against |the **walls**.

The boxed s indicates that Lan did not initially produce the plural morpheme *–s*.

Interestingly, the first way she read the sentence, "They pushed the chairs and desks against the wall," had the exact same meaning as the written text. Yet, in our follow-up discussion Lan was quick to point out she had corrected this miscue and reluctant to agree with me that she probably didn't need to change her reading:

Investigator:	You read against the wall.
Lan:	And then I read /s/, yeah.
Investigator:	I heard it. When I marked it, I said you corrected it. I said that you added that at the end. So if they say 'they pushed chairs and desks against the wall' does it change the meaning?
Lan:	[shakes head no]
Investigator:	Is it still correct grammar? Does it still sound like English… Yes. So it doesn't change the meaning, the grammar's still ok. Does it look the same?
Lan:	[shakes head no]
Investigator:	Does it sound the same?
Lan:	[shakes head no]
Investigator:	Almost, wall, walls. Tiny little difference, but you can hear it. You can hear that difference. So did you need to correct his one?
Lan:	[nods head yes]
Investigator:	Why?
Lan:	I don't know.
Investigator:	Probably this one, I don't think you needed to change it. I mean maybe if you want to be perfect, read exactly what's in the text, I understand, you need to change it. I would do the same. But to understand the meaning of the text, the mistake, the miscue you made is actually just as good. I think. What do you think?
Lan:	Think… uh…
Investigator:	I know you're a person, you like to read it exactly what's there, don't you?
Lan:	[nods yes]
Investigator:	That's ok. Maybe that's just the way you are as a reader.

Lan's readings, in fact, included the highest number of *overcorrections*, which are defined by Goodman, Watson, and Burke (2005) as "those that are fully acceptable, both syntactically and semantically, and do not need correction, but the reader corrects, indicating the reader's excessive concern for exactness and focus on surface features of

the text" (p. 154). The number of *overcorrections* in Lan's reading increased after the first RMA session from 2 (8% of Grammatical Relations miscues) to 5 (14% of Grammatical Relations miscues), and I wondered if she became hyper vigilant about fidelity to the text as a way of achieving a more native-like reading and whether this was a reaction to our discussions of her miscues.

2.3.8 Limitations of Baseline Assessments

As noted in Sections 2.2.4.2 and 2.2.4.3, the QRI-5 and the PPVT-4 have not been tested on nonnative speaker populations.

The QRI-V has been pilot tested with 1,000 native English-speaking students, and tests of inter-scorer reliability are 98% or higher. But, the manual notes unique challenges for nonnative speakers, stating, for example, that determining whether one hears a pronunciation difference or a reading error is "problematic when teachers who use Standard American English are listening to children...whose pronunciation reflects the sound system of another language" (p. 17).

Age norms for the PPVT-4 are based on a representative set of 3,540 people between the ages of 2;6 and 90, but the instrument was "normed exclusively on individuals who are proficient in English" (Dunn & Dunn, 2007, p. 3).

Results from these two measures provided valuable insights into the study subjects' individual abilities; however, I also noticed variables unique to ELLs that must be considered when interpreting results. First, as I noted in Section 2.2.5.1, it was difficult to assess prior knowledge because prior knowledge questions on the QRI-5 may

have measured either concept or vocabulary knowledge. When I asked Bao-yu, who had shown me an exceptional Chinese calligraphy scroll she had painted, the prior knowledge question: "What is an illustrator?" she answered: "Well, it's a noun...Well, like something we use, or some person?" When I asked Lan, who was a member of the track and field team at the time, the prior knowledge question: "Why do people run races?" she was unable to give any answer. These results suggest that L2 proficiency, and not concept familiarity, may have factored into ELLs' ability to demonstrate prior knowledge on the QRI-5.

Second, results on the PPVT-4 suggested that on average adolescent ELLs progress through almost twice the typical (native speaker) number of word sets to establish basal and ceiling sets, thus extending the critical range and length of the test session. The PPVT-4 manual states that the average number of vocabulary sets researchers must administer to achieve basal and ceiling scores is 5. I collected data from 19 administrations of the PPVT-4 during the study and found that on average ELL students went through 8.89 vocabulary sets to establish basal and ceiling scores (see Table 21).

Table 21: Total PPVT Vocabulary Sets to Establish Basal and Ceiling

Subject	Time 1	Time 2	Time 3	Average Number of Vocabulary Sets by Subject
Ana	11	12	9	10.7
Xue	9	7		8
Bat	5	11	13	9.7
Bao-yu	7	11+	7	8.3
Marco	11	5		8
Chong	9			9
Eiko	8	7		7.5

Lan	10	10		10
Nikon	7			7
Average Number of Vocabulary Sets by Time	8.6	9	9.7	

+Student became fatigued and testing was discontinued after 11 vocabulary sets

The increased number of vocabulary sets extended the timeframe needed for testing and caused fatigue in some subjects in this study.

2.4 General Discussion

The *National Reading Panel* focused on five areas of reading: phonological awareness, phonics or alphabet awareness, fluency, vocabulary and comprehension. Oral language proficiency and motivation have also been suggested to play an important role in English language learners' reading (August & Shanahan, 2006; Klingner, & Geisler, 2008).

This study measured decoding accuracy, fluency and comprehension over the course of four RMA sessions and collected interview data from students before, during and after the RMA sessions. Earlier case studies (Goodman & Marek, 1996; Marek, 1987; Wurr, Theurer, & Kim, 2008) found that RMA helped readers revalue themselves and understand the reading process, and this study suggested this might also be true for ELLs. At the same time, this study found little to no improvement in the focal students' decoding accuracy, fluency or comprehension after four weeks of RMA.

One student (Bat) showed improved fluency over the course of the RMA sessions as well as in a comparison of pre- and post-measures. He also noted this area of improvement in a follow-up interview. On the other hand, Eiko showed consistently

worse scores for fluency over the course of the RMA session and consistent fluency scores on pre- and post QRI readings. Eiko's slower reading rate over the course of the RMA sessions may have been due to hyper-awareness of her miscues because she continued to feel a miscue was "not the way its supposed to be."

Though some students showed improvement in decoding accuracy over the course of the RMA readings (Lan and Bat) or on the QRI-5 post-test scores (Ana, Marco, Bat and Lan), only Lan and Bat showed improvement on both measures, and neither student improved dramatically in reading level on the QRI-5. Since all students showed small improvements in language proficiency and only slight (or no) improvement was evident on reading measures, it is possible the improvements seen on reading measures were related to gains in English proficiency rather than RMA.

One limitation of the study was the small number of subjects. It may also be that RMA needs to be implemented over a longer period of time to have an effect on decoding accuracy, fluency, vocabulary or comprehension or that positive effects of RMA are not immediate but come in the form of increased future reading and/or awareness.

Most subjects reported positive feelings about the RMA sessions and motivation to continue reading. These comments could have stemmed from the subjects' relationship to me as students. They may have felt obligated to comment positively on the approach, trusted I would only use a method that I knew would help them learn, or felt there would be an advantage to them in telling me they enjoyed our sessions together. However, their responses could also indicate that RMA has the potential to motivate ELL readers. Furthermore, RMA might be useful to build some adolescent ELLs' confidence

in their reading skills, especially in their ability to read aloud. Subjects appeared to enjoy the one-on-one time with their teacher, as Bao-yu illustrated in her comment: "I think it's great. I feel like I am talking to my friend and more like telling a story." And Ana wanted to continue to read together even after the RMA sessions were over.

At the same time, it is important to be mindful that some students may believe their miscues stem from their nonnative language production and may feel defeated by discussion of reading miscues in the RMA format. Adjustments and special instructions for using this approach with nonnative speakers so that RMA discussion focus on errors they really need to and *could* fix or don't need to fix rather than on developmental errors that occur as a result of interlanguage may improve its effect.

Furthermore, I strongly suggest that ELL students receive assistance with unknown words when they ask for help or read only independent or instructional level texts for this process for a number of reasons. First, vocabulary is a known area of weakness for ELLs in reading (see Section 3.3.1 in Chapter 3 for further discussion). Second, interventions that target vocabulary knowledge are associated with notable reading comprehension outcomes for ELLs (Keiffer, 2009: Kieffer & Lesaux, 2010; Latham, 2013). Third, it is widely accepted practice for teachers to scaffold vocabulary learning for ELLs, and an approach that precludes this is far less applicable in today's schools.

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CHAPTER 3: CODING ENGLISH LANGUAGE LEARNERS' ORAL READING ERRORS: A METHODOLOGICAL EXPLORATION

3.1 Introduction

Oral reading errors, or miscues, are thought provoking. They give rise to questions about their sources and about the process of reading in general. Scholarly interest in using miscues to understand the reading process was strongly influenced by Kenneth Goodman's work in the field of reading in the 1960s (Goodman & Marek, 1996). Cross-linguistic research has also explored reading errors as a way of understanding how different writing systems shape an individual's metalinguistic skills.

Analysis of oral reading errors, also known as miscue analysis, has not gone without challenge. Leu (1982) lauds the potential of reading miscue analysis but indicates two problems that arise in much of miscue analysis research; namely, methodological issues have not been adequately addressed, and major assumptions have not been adequately tested. Leu lists three methodological issues in his review:

> 1. The general failure to explain decisions related to either the unit of analysis (punctuation, letters, words, phrases) or the definition of error categories.
>
> 2. The inadequate attention given to the effect of relative passage difficulty on error type.
>
> 3. The difficulty in distinguishing which of several information sources was used in the case of multiple-source errors. (p. 425)

As a result of the first methodological issue, synthesizing the findings of error analysis studies is difficult. For example, coding systems have used different methods to assess the phonological and graphic similarity miscues have with target words. Furthermore, the challenge presented by multiple-source errors exemplifies the fact that, "it is impossible to separate actual from possible sources of error production precisely" (p. 430).

The study of using Retrospective Miscue Analysis (RMA) as a reading approach with second language learners that I describe in Chapter 2 generated thousands of oral reading errors. As outlined in the procedures for RMA, I coded these oral reading errors with the Reading Miscue Inventory (RMI). Some of the challenges Leu (1982) noted and additional, unique challenges arose in using this system because it was designed for monolingual English speakers, not second language readers. I was able to address the issue Leu notes about passage difficulty because I assessed the reading level of my subjects and chose instructional level texts for them to read. I did find, however, that RMI coding demonstrated the third problem noted by Leu—that coding systems have difficulty separating actual sources of miscues from possible sources of miscues. In my study this was likely the case because all of my subjects were nonnative English speakers.

In this chapter, I first discuss the unique challenges second language readers' errors pose to coding with the RMI. Next, I explore how another coding system developed by Cheng and Caldwell-Harris (to appear) addresses the unique features of second language readers' errors. Throughout my discussion of the two coding systems, I

have included student interview data that was gathered during RMA interviews. This interview data, though not authoritative on what caused miscues, provides valuable insight into what coding systems can and cannot tell us about oral reading errors.

For readability, I provide background on the coding systems in the results section as I discuss my findings.

3.2 Methodology

Miscue data were collected from nine participants, before, during, and after a Retrospective Miscue Analysis (RMA) (Goodman & Marek, 1996) procedure and were then compiled in a database. All miscues in the database were coded with two systems. The first system, Reading Miscue Inventory (RMI), developed by Goodman, Watson, and Burke (2005), is a version of the original coding system used with RMA. The second coding system was adapted from Cheng and Caldwell-Harris (to appear). Additionally, 134 miscues that had been selected for RMA were discussed with students and these discussions yielded qualitative interview data that provided a third lens through which I could begin to understand the sources of ELL oral reading errors and the complexity of coding them. I compared what students told me in interviews about their errors to conclusions the coding systems would lead me to draw.

3.2.1 Participants

Nine subjects were recruited to participate in RMA, and the data for this analysis was gathered before, after and during the RMA sessions. Three subjects did not complete

all four RMA sessions, but their data was included in the inventory of oral reading errors for the purpose of this study because it was not necessary to this analysis for them to have completed all of the sessions.

All subjects were nonnative speakers of English. I invited all students who were in the Transitional English class of the Schoenberg High School ELE program during the 2010-2011 or 2011-2012 school year and were still attending the school at the time of the study to participate. One additional student who had transferred from another school without records of English language services volunteered and was included. The students were between the ages of 14-17, and none had begun schooling in an American school before the age of 13. Of the nine students, four spoke Chinese as a first language, two spoke Bulgarian as a first language, one spoke Mongolian as a first language, one spoke Russian as a first language and one spoke Japanese as a first language (see Table 2 in Chapter 2). According to a preliminary questionnaire, none of the students had stopped going to school for more than three months. All students had literacy skills in their first language (see Table 3 in Chapter 2) and reported being motivated to learn English and work hard in school (see Tables 4 and 5 in Chapter 2).

3.2.2 Instruments

3.2.2.1 RMI Coding with the RMI followed procedures outlined for the "In Depth Procedure" in Goodman, Watson, and Burke (2005). These are described in Chapter 2 in section 2.2.4.6.

3.2.2.2 Cheng and Caldwell-Harris' Codes for Oral Reading Errors Cheng and Caldwell-Harris (to appear) developed a system for coding oral reading errors in Chinese and subsequently used it to code oral reading errors in English. This system will be described in detail below in Section 3.3.2.

3.2.2.3 RMA Interview Data During the RMA analysis from which the coded oral reading error data emerged, adapted RMA interview questions (see Table 7 in Chapter 2) were used to guide a discussion with students about their reading miscues (see Appendix B for original RMA interview questions). Students were given a typed list of questions to refer to during RMA and encouraged to use a bilingual dictionary or ask the investigator about words they did not understand. These questions were also asked orally during the interview. As recommended by Goodman and Marek (1996), the questions were not all asked in every situation, but rather the post-reading interview was a natural conversation, guided by these questions. Information subjects provided during these interviews was compared to the source of error indicated by the miscue and oral reading error coding systems.

3.2.3 Procedure and Data Analysis

During subjects' pre- and post-RMA readings with QRI-5 texts and during subjects' RMA session readings, oral reading errors were simultaneously audio recorded and written on typed transcripts. After the reading session, I listened to the audio recording and checked my transcriptions of oral reading errors.

The RMI manual (Goodman, Watson, & Burke, 2005) indicates nonwords by including $ before the word, but it does not use the International Phonetic Alphabet (IPA) (International Phonetic Association, 2005) for nonword representations. I thought this was a weakness and adapted their procedure by providing a phonemic transcription of all miscues in IPA and indicating this with the standard [] notation around the word, rather than using the $ notation. This way I could consistently represent the sound of what students produced.

Oral reading errors were next coded using the RMI procedure outlined at length in Goodman, Watson, and Burke (2005). I made concurrent notations when I felt the coding system was not capturing a possible source of the reading miscue or illuminating oral reading error patterns that I felt were unique to English language learners.

After completing RMIs for each individual reading, I created a database of all subjects' oral reading errors over the course of the study (n = 3,714). I next employed Cheng and Caldwell-Harris' system of coding oral reading errors to the data (see Appendix F for a description of their complete system.

I discussed 134 miscues with study participants and transcribed interviews with subjects about 94[9] of these miscues. The interview data was compared with the RMI coding and Cheng and Caldwell-Harris' coding.

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[9] Some of miscue conversations were not transcribed word-for-word because of recorder malfunction, in which case notes were taken. Some miscue conversations were not selected for transcription because the student had difficulty hearing the miscue.

3.3 Results

3.3.1 Reading Miscue Inventory (RMI) and Retrospective Miscue Analysis (RMA) Explorations of Oral Reading Errors

Goodman, Watson, and Burke (2005) indicate that "[t]he main purpose of miscue analysis is to help teachers and researchers gain insight into the reading process as a *sociopsycholinguistic, transactive model of reading*[10]" (p. 4) This method of miscue analysis attempts to capture how meaning is constructed through interaction between the reader and the text, and it has been attractive to researchers and teachers because it can be conducted in an authentic classroom context with authentic texts and without disruptive `changes to existing classroom routines.

The most thorough system for coding miscues that follows this theory is the Goodman Taxonomy of Reading Miscues (Goodman, 1969). It has been developed and revised by "analyzing the degree to which miscues change, disrupt, or enhance the meaning of written text" (Goodman, Watson, & Burke, 2005, p. 5) for the purpose of analyzing how readers use "the linguistic sources of information available" (Leu, 1982, p. 423) to them as they read (e.g., phonological, semantic and syntactic information). Its proponents refer to oral reading errors as "miscues" rather than errors because they endeavor to consider misread text as a product of proactive processing that the reader engaged in while trying to make meaning from text rather than as evidence of deficits in the reader. The taxonomy evaluates miscues through consideration of whether and/or to

[10] Italics are carried over from the original.

what extent each miscue:

- is corrected by the reader
- is a product of dialect variation
- is graphically similar to the expected response (ER)
- is phonemically similar to the ER
- is an allolog of the ER (e.g., the text says *isn't* and the reader reads *is not*)
- is syntactically acceptable in text
- is semantically acceptable in the text
- is a grammatical transformation of the ER
- demonstrates a syntactic change from the ER
- demonstrates a semantic change from the ER
- involves an intonation shift or change
- involves variations at the phonemic level (e.g., substitution, omission, insertion, reversal of phoneme(s))
- involves changes to bound or combined morphemes
- involves changes at the word and free morpheme level
- involves changes at the phrase level
- involves changes at the clause level
- involves a particular grammatical category (e.g., noun, verb)
- is influenced by visual periphery

There are numerous variations on this system for inventorying reader miscues that have resulted from new research findings (Goodman, 1984, 1994, 1996), adjustments for

classroom use (Goodman & Burke, 1972; Goodman, Watson, & Burke, 2005) and examination of reading in other languages (Wang, 2012).

Yetta Goodman and Carolyn Burke (1972) developed the original nine questions of the Reading Miscue Inventory (RMI) from the Goodman Taxonomy of Reading Miscues as a vehicle to bring miscue analysis to classroom teachers. The RMI is the instrument used by teachers and researchers to analyze readers' miscues when they implement the Retrospective Miscue Analysis (RMA) procedure as well. The most recent versions of this procedure for readers of English are outlined extensively in Goodman, Watson, and Burke (2005), and Wang (2012) has adapted the Goodman Taxonomy for use with Chinese readers. Goodman, Watson and Burke recommend the In-Depth Procedure of RMI be used for research because Long (1985) found that simplified analyses of miscues do not help teachers to understand the complexities in evaluating individual readers or to develop their own reading model.

Although Goodman, Watson, and Burke (2005) also claim that use of RMI procedures can reveal "[h]ow miscues of second-language learners reveal mother tongue influences" (p. 10), there are no unique RMI procedures to follow when analyzing L2 readers' errors other than a note to take dialect into consideration and a reminder that "readers, including second language speakers, are often made to feel self-conscious about their oral language" (Goodman, Watson, & Burke, p. 86). Wurr, Theurer, and Kim (2008) used the RMI with proficient adult ESL readers when they studied RMA but also do not indicate any procedural adjustments for its use with this population.

Miscue analysis research using the RMI has led to the following conclusions. First, there is a single reading process that readers of all proficiencies engage in (Goodman, 1996; 2004). Furthermore, readers adjust their reading according to the text; they may not always read at the same speed (Flurkey, 1998), and they may not read word for word when reading connected text (Paulson, 2002; Paulson & Goodman, 1998). Proficient readers "produce syntactically and semantically acceptable structures most of the time, either by predicting appropriate structures or by correcting unacceptable ones...Proficient readers' graphic and sound similarity scores may be in a moderate range or lower than those of less proficient readers" (Goodman, Watson, & Burke, 2005, p. 165).

Readers who are less proficient may produce syntactically and semantically correct sentences but rely more on graphophonic information, read more slowly and make corrections to errors in their reading when their miscue does not impede their ability to make meaning from the text. Their retellings demonstrate comprehension of facts but less awareness of subtlety and/or character development in the text.

Finally, the researchers who developed the RMI advocate a whole language approach to reading based on findings that "the more personally involved students are in their reading the more proficiently they read and the more eagerly they expand their reading opportunities" (Goodman, Watson, & Burke, p. 198).

This study will consider whether the RMI is accurate in coding L2 learners' oral reading errors and will highlight elements of the coding system that need revision for use with second language learners.

3.3.1.1 The Types of Errors L2 Learners Make

I could find no existing research that had used RMI to discover miscue patterns unique to second language learners. In order to arrive at those patterns, I compared students' interview responses to my analyses of their miscues. In Retrospective Miscue Analysis (RMA) interviews, students gave 17 different reasons for their miscues (see Table 22). Of these 17 reasons, four appeared to me to be crucial to understanding the uniqueness of second language learners' reading: word knowledge, L2 phonology, L2 instruction and L3 transfer (bolded in Table 22). I examine how each of these error types was coded in RMI and discuss a fifth pattern in grammatical morphemes I noticed as I coded.

Table 22: Examples of Students' Answers About Why They Miscued (in Their Own Words and in Mine)

Student did not know why he/she made the miscue	Bat "I don't know. Just read." Bao-yu "I don't know…there must be ghosts around it. I don't know." Ana "I have no idea." Lan "I don't know."
Student was not concentrating	Bat "I wasn't thinking there." Bao-yu "I think I didn't read carefully." Chong "I didn't really see that…"
Student did not know word	Bat "I don't know this word." Eiko "because I didn't know this word so I just missed it"
Student did not know pronunciation	Bat "Maybe I didn't know how to say that." Eiko "'Cause I just forgot like how to read 'clothes' in like plural form"
Student thought the word was hard to pronounce	Ana "It was hard to pronounce it." Eiko "'Cause I think for me it's easier to say"
Student thought the read word was faster to read	Lan "'Cause it was faster."
Student thought he/she was reading too fast	Chong "I said it too fast. I didn't pronounce it correctly."
Student was fatigued	Bat "I was so tired…I don't want to read."
Student applied a decoding strategy	Bao-yu "It sounds sort of the same." Eiko "Usually you read those things like that."

Student read something that looked the same	Bao-yu "Looks similar." Ana "Because it looks like this what I read." Lan "'Cause it looks similar."
Student was influenced by word use in earlier parts of the text	Bao-yu "'Cause there so many 'he' an 'him' in the beginning."
Student preferred the substituted word	Bao-yu "'Cause I feel saying 'mom' it might be like a better way, like people usually do that."
Student said the substituted word(s) more often in his/her own speech	Lan "Like [I] always asks the others 'do you know how' to do something." Xue "In this school always call teacher Miss something."
Student was influenced by the storyline	Bao-yu "'Cause Katniss is already home so I said 'I got home' and not 'some'. Marco "Because they already did it' (changed present to past tense)
Student was influenced by L2 learning	Eiko "I think it's like because in my head it is the same like stood and stand. Like when I was in Japan, like when I first studied about the past tense of English, I had to memorize like stand and stood."
Student read without attention to context	Eiko "I just read the word without thinking about the whole sentence"
Student used L3 information	Bao-yu told me she read one word because it looked like a French word

3.3.1.2 Word Knowledge Errors in RMI Coding

Numerous studies on second language reading have suggested that vocabulary is a major area of challenge for English language learners (ELLs) and bilingual readers (Jimémez, García, & Pearson, 1995; Kuo & Anderson, 2008) and presents an even greater challenge to these subpopulations than it does to monolingual readers (Klingner & Vaughn, 2004). The *Report of the National Literacy Panel on Language Minority Children and Youth* (August & Shanahan, 2006) suggests that oral language proficiency, including vocabulary knowledge, in a second language (L2) is strongly correlated with reading comprehension in the L2.

Qian (1999) explored knowledge of vocabulary more closely, examining the unique roles of depth and breadth of vocabulary knowledge in Chinese and Korean (L1) adult second language readers' reading comprehension of English in a multiple regression analysis. He found that both depth and breadth of vocabulary knowledge are strongly correlated with reading comprehension and that depth of vocabulary knowledge makes a unique contribution above and beyond breadth of vocabulary. Fitzgerald's (1995) metaanalysis of studies of second language reading also found that stronger L2 readers make better use of cognates than weaker readers and overall have more vocabulary knowledge. And Jimémez, García, & Pearson (1996) found that even successful sixth and seventh grade bilingual Latina/o readers, who had indicated "English" or "either" as their preferred language, may have a greater need than successful monolingual English readers to focus on vocabulary in reading. Although limited vocabulary knowledge can be an obstacle to comprehension for monolingual native English-speaking readers, second language learners have more significant gaps in vocabulary knowledge than native English speakers and may undergo additional steps to match L2 words encountered in text with existing concept knowledge and/or words known in L1.

In general, the RMI, as a system designed for native speakers, seems to be based upon the assumptions that a) the reader will know most of the words in a text and b) miscues are caused by *reading ability or skill* rather than *language proficiency*. Language proficiency as a source of miscues for ELLs is not easy to disaggregate with the RMI. Coding ELLs' miscues without RMA interviews is complicated because the

teacher or researcher has to guess if the reader knew the meaning of the misread word. This is illustrated and discussed in my examples below. Furthermore, if an ELL's decoding skills are strong, the number of unknown words that are misread may only be the tip of the iceberg, so to speak, of the number of words in the passage the student does not understand.

In RMA interviews, ELL students most often said that their miscues occurred because they did not know the meaning of a word. Thirty-five of the 94 miscue (37%) interviews I transcribed involved words the ELL readers could not define, and the subjects often felt that this lack of knowledge was the source of their miscue. Their interviews, however, also show that word knowledge is not a binary construct. Knowing a word includes multiple aspects, including pronunciation and spelling; morphological properties; syntactic properties; denotative and connotative meanings; paradigmatic relations; register and discourse features; and frequency of use in the language (Qian, 1999). I will illustrate this with three examples from Bat, Bao-yu and Ana's readings.

In Bat's reading on 3/30/12, he made the following miscue:

3422 The two managers took their places in Box

[sɜˈtɪn] (certain)

3423 5, and the **curtain** rose for the first act.

When we heard this miscue in our RMA session later, Bat and I had the following conversation:

Bat: I don't know this word.

Investigator:	Ok, so you don't know what this word means. Do you know what the word 'certain' means?
Bat:	Certain?
Investigator:	The word you read?
Bat:	Yeah, certain.
Investigator:	What does that one mean?
Bat:	Certain…this word?
Investigator:	No, the word you read.
Bat:	Certain…It's um…a thing?
Investigator:	And you don't know what this word means? [indicating "curtain" on the page]
Bat:	Yeah, I don't know this one.
Investigator:	Ok, um, this word is curtain.
Bat:	Curtain uh…
Investigator:	Curtain means like in the window, the fabric. If there is something you can pull it closed. Also, on the stage there is a curtain. There is a, kind of, piece of cloth that's there. Certain means really sure.
Bat:	Ah, yeah. Ah yeah.
…	
Investigator:	Why do you think you read 'certain' instead of 'curtain'?
Bat:	'Cause I don't know what this word it [*sic*].
Investigator:	'Cause you don't know the word.
Bat:	Yeah I think say that.

It is evident in this discussion that Bat did not know the meaning of "curtain" or "certain," and he was confused by my questions about the meaning of the word "certain." It is likely that his miscue here was not a substitution of one word for another but either an orthographic error or a pronunciation error. This might have been an orthographic error because the letter "c" can correspond to the /k/ or /s/, and he may have simply selected the wrong corresponding sound as he decoded the word. Or, he could have made a phonological error.

This error reveals some of the challenges of using RMI procedures. When I initially transcribed this miscue, I wrote the word "certain" because, as a native speaker, I heard the word "certain," not a nonword that may have stemmed from decoding or L2

phonology. The RMA interview allowed me to learn that Bat had not, in fact, substituted "certain" for "curtain." He had decoded a string of letters and produced something that had little meaning to him as a reader.

Coding this error with RMI before the RMA interview, as the teacher or researcher is instructed to do, gives rise to additional problems. In RMI coding, Bat's miscue was found to have no semantic acceptability because the adjective "certain" does not fit grammatically in the overall grammar of the sentence. It was coded as having no semantic acceptability because it had no syntactic acceptability, and since it was not corrected, the codes in columns 1-4 result in an evaluation of "Loss" in the category of Meaning Construction and "Weakness" in the area of Grammatical Relations (see Table 23).

Table 23: RMI Coding for Bat's Miscue [sɜˈtɪn] for "Curtain"

1 Syntactic Acceptability	2 Semantic Acceptability	3 Meaning Change	4 Correction	Meaning Construction			Grammatical Relations				Graphic Similarity			Sound Similarity		
				No Loss	P Loss	Loss	S	PS	OC	W	H	S	N	H	S	N
N	N	--	N			√				√	√			√		

The RMA interview, however, revealed that Bat knew the sentence he was reading required a noun where he read [sɜˈtɪn]. When I asked him what the word he read meant, Bat answered "'Certain'...It's um...a thing?", indicating that he was aware that a noun was needed in the phrase he read. The score of "Weakness" in Grammatical Relations, then, seems inaccurate.

Interviews with two other students about their miscues exposed similar shortcomings in RMI coding. In Bao-yu's reading on 3/27/12, she made the following miscue

[oblidɪd]

2512 I **obeyed**, as it was my duty.

When we discussed this miscue in the subsequent RMA session, we had the following conversation:

Investigator: Why do you think that you read that one differently.
Bao-yu: I don't know. 'Cause I think I know 'obey', but I don't know what's it mean, and but it add a 'ed' in the end, so I think I should change 'y' into 'i' so…but…well…I don't know.
…
Investigator: Did it change your understanding of the text?
Bao-yu: No. 'Cause I didn't know what's that mean.
Investigator: 'Cause you didn't know what it means, but you know 'obey'.
Bao-yu: Wait, what's 'obey'?
Investigator: Oh, you sort of knew it…like you remembered the…but you couldn't remember the meaning of it.
Bao-yu: Yeah.
Investigator: Just the sort of sound of it?
Bao-yu: Yeah.
Investigator: Obey means to follow rules.

In Ana's reading on 3/6/12, she made the following error:

[liðr]

Odysseus took off his **leather** belt.

We had the following conversation about this error in our later RMA session:

Ana: I pronounce it hard.
Investigator: Yeah. You had a hard time with that one. Do you know how to pronounce that one?
Ana: leather?
Investigator: Yeah. Leather. Leather.

Ana: Leather. Ok.
Investigator: Why did you have a hard time with that one?
Ana: I don't know.
Investigator: Do you know that word?
Ana: Um…I'm not sure.
Investigator: Not sure?
Ana: No.
Investigator: Maybe that's why it was hard. Maybe you don't know that word very well, or you've only seen it one time.
Ana: Maybe yeah. So what's it mean?
Investigator: It means like this [indicating a leather item]…It's the…It's…You can make shoes from it. You can make a jacket from that.
Ana: Oh yeah. I don't know it.
Investigator: It's made from the cow.
Ana: Umhm.

Unlike Bat's miscue above, Bao-yu's and Ana's miscues receive scores of syntactic acceptability in column 1 because the readers' "intonation of the phrase…shows that the nonword is a noun" or the correct part of speech "and therefore the phrase sounds like language" (Goodman, Watson, & Burke, 2005, p. 139) (see Tables 24 and 25). This still leads to a score of "Loss" for Meaning Construction, but these miscues receive a better score of "Partial Strength" for Grammatical Relations.

Table 24: RMI Coding for Bao-yu's Miscue [oblidɪd] for "Obeyed"

1 Syntactic Acceptability	2 Semantic Acceptability	3 Meaning Change	4 Correction	Meaning Construction			Grammatical Relations				Graphic Similarity			Sound Similarity		
				No Loss	P Loss	Loss	S	PS	OC	W	H	S	N	H	S	N
Y	N	--	N			√		√			√			√		

Table 25: RMI Coding for Ana's Miscue [liðr] for "Leather"

1 Syntactic Acceptability	2 Semantic Acceptability	3 Meaning Change	4 Correction	Meaning Construction			Grammatical Relations				Graphic Similarity			Sound Similarity		
				No Loss	P Loss	Loss	S	PS	OC	W	H	S	N	H	S	N

Y	N	--	N			√		√			√			√		

This determination of syntactic acceptability based on the reader's intonation while reading appears inaccurate when information from RMA data is examined. In contrast to the conclusions drawn with the RMI, Bat and Bao-yu's interviews suggest that they might have known something about the word they misread, namely what lexical category it fell into, and Ana's interview gives no indication she knew the lexical category of the misread word. Like Bat, who noted in his interview that [sɝtɪn] was a thing, Bao-yu demonstrated awareness of grammar during her RMA session. She noted her use of parallel linguistic forms in her answer, explaining: "I think I know 'obey', but I don't know what's it mean, and but it add a 'ed' in the end, so I think I should change 'y' into 'i'..." Ana's interview, on the other hand, gives no indication she knew something about the lexical category of the word she misread.

As can be seen in these interviews, RMI coding also did not capture the students' ideas about why they miscued. The codes for Meaning Construction and Grammatical Relations do not reflect that Bat and Bao-yu attributed their miscues to a lack of word knowledge, whereas Ana focused more on her pronunciation of the misread word, despite also not knowing its meaning. When RMA is used and students are interviewed about their miscues, the teacher or researcher can uncover more of what the student knows about a word, but students are never interviewed about all of their miscues because it takes too much time. In this study, it took 20-30 minutes to interview a subject about five miscues, and a subject sometimes made over 100 miscues in one reading. Even if readers were interviewed about all of their miscues, it would be a mistake to assume that they are

always consciously aware of their knowledge or the strategies they are using. When one reads with automaticity, he/she is able to process "text at the orthographic level…without conscious attention" (Kuhn & Stahl, 2004, p. 417). This was illustrated aptly in a conversation I had with Bao-yu when I asked her why she made one of her miscues and she responded: "I don't know…there must be ghosts around it."

The scores for Sound and Graphic Similarity are also questionable for these miscues, and these issues will be discussed at length in Section 3.3.1.3.

The three examples of miscues discussed above show that the readers did not know the denotative meaning of the words they misread, so these miscues might have been correctly coded as semantically unacceptable in column 2. However, ELL students' also miscue when they do not know pronunciation or spelling of a word, but do know the denotative meaning. Bao-yu's miscue from 4/12/12 illustrates this:

[protaflo]
[protafio]
[protafiolo]

2733 "Ah! That hurts your pride. Well, fetch me your **port-**

[kantɛnst]

2734 **folio** if you are sure its contents are original, but don't

[dɪsɪv]

2735 try to deceive me.

As she was trying to read the word "portfolio" aloud, Bao-yu told me "I know it's a binder…you put drawing in it." In RMI, however, this miscue, like the three above, is coded as having no semantic acceptability (see Table 26) because the reader did not know the pronunciation and/or spelling of the word.

Table 26: RMI Coding for Bao-yu's Miscue [protafiolo] for "Portfolio"

1 Syntactic Acceptability	2 Semantic Acceptability	3 Meaning Change	4 Correction	Meaning Construction			Grammatical Relations				Graphic Similarity			Sound Similarity		
				No Loss	P Loss	Loss	S	PS	OC	W	H	S	N	H	S	N
Y	N	--	N			√		√			√			√		

Another similar example from the same text and reader follows:

2727 Mr. Rochester
[stɛtʃɪz]
blah

2728 continued, "Adele showed me some **sketches** this morn-
c
luse

2729 ing, which she said were yours.

Bao-yu occasionally substituted a word with "blah" and moved on in her reading. Here she first says "blah" when she comes to the word "sketches" in the text, and then she produces [stɛtʃɪz]. When I asked her about this later, the following conversation ensued:

Investigator: This one is 'sketches'
Bao-yu: Oh, sketches.
Investigator: What was hard about this word?
Bao-yu: I don't know.
Investigator: Do you know this word?
Bao-yu: Yeah. You know how I know them? From iPad. 'Cause like there are some drawing thing on it and so when I want to download it, I know it's about like kind of a drawing.
Investigator: So, you've seen this word before. Did you hear it before?
Bao-yu: No.
Investigator: It's interesting. Sometimes when I see a new word in English I know the meaning and I've never heard it; I also read it wrong.
Bao-yu: Oh.

This conversation shows Bao-yu had a good understanding of the meaning of the word "sketches", but she didn't know how to pronounce it. Her initial substitution of "blah" may be an indication of her impatience to move along in her reading because she understood what she was reading, even if she didn't know how to decode the word.

Marco also miscued when he encountered words in text that he did not know the meaning of, but he often told me these errors were not that important for his overall understanding. For example, on 5/10/12, in our second RMA interview, he told me "I make kind of a picture what's happening and if some word's different, even if like this word here 'shepherding', if I don't know it I just continue read. I mean I know what it talking about." It seemed that for Marco, even when individual miscues would earn codes of semantically unacceptable and "Loss" in the RMI category of Meaning Construction, he was able to construct meaning from the overall text. It should be noted that Marco already knew the story he was reading, and this may have contributed to his apparent nonchalance about individual word meanings.

3.3.1.3 L2 Phonology Errors in RMI Coding

It is widely known that nonnative speakers, especially those who acquired an additional language after childhood, can be identified by a foreign accent. SLA theories, such as the Contrastive Analysis Hypothesis (Lado, 1957), the Markedness Differential Hypothesis (Eckman, 1977), the Speech Learning Model (Flege, 1992, 1995) and Optimality Theory (Prince & Smolensky, 1997), have explored this phenomenon, noting that a variety of factors influence L2 perception and pronunciation, including L1 transfer,

the nature of the L2 sound, similarity of L1 and L2, and L2 development. L2 phonology is characterized by perception and production of both (a) individual phonemes—for example, we may note that nonnative speakers of English often have difficulty producing /ð/, and (b) suprasegmental features—for example, constraints on syllable structure in L1 may affect production of consonant clusters in L2 onsets or rimes.

L2 phonology presents a challenge for coding miscues because it can be difficult to determine if a miscue is a result of pronunciation difficulty/difference or an inability to identify and comprehend a given word. If a native speaker of English reads the word "skull" as [skul] (school) or [skʊl] (nonword), there are multiple possible explanations for the miscue, but one reason could *not* be that /ʌ/ and /u/ do not exist or do not contrast in his/her native language. On the other hand, if a nonnative speaker reads "skull" as [skul] or [skʊl] the miscue could be attributed to L2 phonology or foreign accent.

In the RMI procedures, a miscue such as the hypothetical one of "skull" read as [skul] or [skʊl] would most likely be coded as syntactically acceptable. Semantic acceptability would depend on whether the word made sense in the sentence. According to Goodman, Watson, and Burke (2005), if a reader read [skʊl] (nonword) for "skull," the teacher or researcher would note that [skʊl] "is not an English word, the substitution does not make sense and the miscue is marked semantically unacceptable, **N**" (p. 139). A problem with this coding arises, however, because it takes into account only the researcher or teacher's *perception* of the miscue and not the L2 speaker's *intention*. In other words, the L2 speaker may have recognized, understood and intended to produce the target but produced small differences in sounds that led the researcher to hear and

interpret the production as a nonword or a different, unintended word.

This type of miscue was prevalent in my data and is unique to L2 learners. In the database of ELL miscues I compiled, there were many miscues, such as Bat's miscue of [sɜˈtɪn] for "curtain" in the previous section, that differed from the target word by only one phoneme. Vowel errors were particularly difficult to judge because vowels do not have cut and dried acoustic boundaries and are known to present persistent issues in L2 speech perception and production (Strange, 2007). In the database of ELL miscues, I counted 669 miscues (18%) that differed from the target by only one vowel. This figure certainly cannot be read as the number of miscues that unequivocally involved foreign accent, but I note it here because I found these miscues especially difficult to judge. It was often unclear if my subjects' miscues stemmed from foreign accent or were true miscues, stemming from the act of reading.

Admittedly, the RMI indicates that dialect variations should not be coded as miscues, but even with ten years of experience working with nonnative speakers of English, I still had a hard time determining confidently whether the source of a miscue was inaccurate decoding or L2 phonology. I explored some of these miscues with students during RMA sessions, and the interview data demonstrate the difficulty in judging these miscues.

Chong and Lan, both Chinese speakers, read the word "smile" in a way that sounded like "smell" to me, and I asked them each about this. On 5/13/12, Lan read:

0511 He

[**smɛld**] (**smelled)**
0512 **smiled** in at Fred.

On 5/18/12, Chong read the following:

c
[**smɛld**] I sighed
0216 He **smiled** and said, "There's no mystery to it,

0217 Madam.

In our later RMA interview, Chong and I discussed his miscue. He indicated that he understood the meanings of both the target word and the miscue, but asserted that he had not substituted "smelled" for "smiled," but rather had just read "smiled" too quickly:

Chong:	Oh, I said it too fast. I didn't pronounce it so clearly.
Investigator:	What did you say?
Chong:	I said 'smell'
Investigator:	Yeah, you said 'smelled' instead of 'smiled'. Does that change the meaning?
Chong:	Yes.
Investigator:	Yes it does. And did it change your understanding of the text?
Chong:	Yes.
Investigator:	When you were reading it?
Chong:	[student laughs] He smelled and said… [laughs]
Investigator:	That' s a pretty funny one. So, did you need to correct this?
Chong:	Yes.
Investigator:	Why do you think you read it like that?
Chong:	Oh, like maybe I just thought like I xxx wanna read like fluently (?)…fluently(?), so I didn't like I didn't stop like really really clean(?)… like pronounce it really clear…said 'smell' instead of 'smile'
Investigator:	Is that a sound that Chinese doesn't have?
Chong:	Smile…[aj]…Chinese doesn't have this…but like, I don't know…It's easy for me if I like xxx

Investigator: Yeah, when you say it…you don't have trouble saying it.
Chong: You ask reading…maybe reading too fast.
Investigator: Maybe reading too fast? You keep saying reading too fast. I don't think you were reading too fast.
Chong: I mean I reading like…[gesture]
Investigator: Ok.

Interestingly, despite the fact that Chong told me the diphthong /aj/ didn't exist in Chinese, he also didn't feel it was a difficult sound for him to pronounce. In fact, Chinese does feature the diphthong /aj/, but Chang (2001) notes that "Chinese diphthongs are usually pronounced with quicker and smaller tongue and lip movements than their English counterparts. Learners therefore make these sounds too short, with not enough distinction between the two component vowels" (p. 311). This difference may have affected Chong's pronunciation and my perception of his reading.

Chinese does not have the phoneme /ɪ/, however (Chang, 2001), and this might have made it difficult in the example below for Chong to hear what I perceived as a miscue in his 5/22/12 reading:

0605 "But maybe it was just the

[wajnd] cracking
0606 **wind** and the creaking of the house."

Chong: The wind?
Investigator: Yeah.
Chong: Did I say…I said 'the wind' right?
Investigator: I thought you said [wajnd]
Chong: Really?
Investigator: Yeah. Let's go back and hear it back.
Chong: The [wajnd]…I don't know.
[listened again]

Chong: Oh it sounds like the [wajnd] but I did say wind.
Investigator: I think you did say wind. I was asking because you know this word, it looks exactly like that and you say [wajnd].
Chong: You say [wajnd]?
Investigator: Yeah
Chong: Sometimes?
Investigator: Yeah, it means something different…It's spelled just like that, but it means like if you have cord you can wind it up.
Chong: Oh.
Investigator: So it looks exactly the same but it sounds different.

Lan and I also talked about the homographic nature of the written word "wind" on 5/31/12. She had read the following sentence:

[wɪndɪŋ]
2013 He remembered the **winding** road and

2014 bridge that crossed it.

When I asked her about this, she was also unaware of the second meaning of "wind" [wajnd]:

Investigator: How did you read that word?
Lan: [wɪndɪŋ]
Investigator: Ok. And do you know how I would pronounce that word?...Winding [wajndɪŋ] …So, how did you decide how to read this word?
Lan: Wind [wɪnd].
Investigator: Wind [wɪnd]. That's a good guess. In fact, I'll show you something kind of tricky about English. [writing]. This is the word "wind" [wɪnd]. This is the word "wind" [wajnd]. They look exactly the same! Wind, of course, is the air, right? Do you know what wind [wajnd] is?
Lan: No.
Investigator: Wind is when something goes around and around. So sometimes I might wind my hair around my finger.
Lan: Oh.

Investigator: And here if you have a winding road, the road isn't straight. It goes like this [gesturing]. Ok? So this one would be winding. And the only way you would really know that its not winding, it's winding, is well…one is usually because wind is usually a verb and wind is usually a noun. But the other way is to understand the sentence…to be able to guess because of…because of the sentence. So did this change your understanding of the sentence?

Lan: Yeah.

Investigator: Uhuh, and so did you need to correct it?...Here you did. But it looks exactly the same, right? And it sounds almost the same.

What is interesting about Chong's and Lan's miscues when looked at together is that they received exactly the same coding in RMI (see Table 27), but in Chong's case, he understood the meaning of the word written and intended to read the word "wind" [wɪnd], whereas Lan did not understand the meaning of the word written and read a nonsense word based on a word she knew. In reality, it seems that Chong's error was a dialect or L2 phonology variation of the target word (or perhaps a misapplication of an orthographic pattern for the given context; reading [wajnd] could have been influenced by knowledge of words like "find" and "mind") and should have been coded as semantically acceptable, whereas Lan's miscue was indeed semantically unacceptable, as also noted in the RMI.

Table 27: Coding for Chong's Miscue of [wajnd] for "Wind" and Lan's miscue of [wɪndɪŋ] for "Winding"

1 Syntactic Acceptability	2 Semantic Acceptability	3 Meaning Change	4 Correction	Meaning Construction			Grammatical Relations				Graphic Similarity			Sound Similarity		
				No Loss	P Loss	Loss	S	PS	OC	W	H	S	N	H	S	N
Y	N	--	N			√		√			√			√		

Another Chinese reader, Xue, also struggled with these homographs. On 3/9/12 she read:

4416 "Then, sir, come this way." He led us down a passage,

[barid] **[wɪndɪŋ]**
4417 opened a barred door, passed down a **winding** stair, and

4418 brought us to a whitewashed corridor with a line of doors

4419 on each side.

Our later conversation suggests that she vacillated between the two possible pronunciations for "wind," did not have trouble pronouncing either, but only knew the meaning of one:

Investigator: So how do you pronounce that word. You tried winding [wɪndɪŋ] and you tried winding [wajndɪŋ].
Xue: It's [wɪndɪŋ]. I pronounce like a winding [wajndɪŋ]. Is that right?
Investigator: Actually winding [wajndɪŋ] is correct.
Xue: Really? So it's not a wind [wɪnd]. It's a wind [wajnd]?
Investigator: The word wind [wɪnd] is when the air moves, right? Wind [wajnd] means to wrap around.
Xue: Wind [wajnd]. Wait, how do you spell wind [wajnd]? W-i-n...
Investigator: Both are spelled the same way, but you pronounce it differently.
Xue: Oh my god.
Investigator: So I was wondering if you know that one. Do you know the word wind [wajnd]?
Xue: No.
Investigator: So you can wind through the streets. You can wind a bandage. You can wind a wire. It's to kind of wrap around.
Xue: Oh. Ok. Winding.
Investigator: So this one should be winding, yep. And you knew the word wind /wind/, so that's why you pronounced it like that?
Xue: Yeah.
Investigator: Did it change the meaning for you?

Xue: Yeah
Investigator: Did you know what this meant when you read it?
Xue: The winding stairs xxx one right? So…I pronounce like a winding [wɪndɪŋ] stairs, like the stairs have a lot of wind on them.
Investigator: Yeah.

Xue's application of two different pronunciations in her initial reading and her answers to my questions in the follow-up discussion indicate that pronunciation of the target word was not an area of difficulty for her. Rather, she, like Lan, selected the pronunciation for the word she knew (i.e., [wɪnd]), even though, upon reflection, she found that word's meaning strange in the sentence. Here, too, RMI codes the miscue as was done for Chong's and Lan's readings (see Table 27).

RMI also allows only a coarse look at sound and graphic similarity, and no instructions are given for words that differ, not just in number or nature of individual sounds, but in syllable structure. For example, in scoring Sound Similarity, the words "wood" [wʊd] and "woods" [wʊdz] are coded as **H** (highly phonologically similar) but so are "Ms." [mɪz] and "Mrs." ['mɪsɪz]. And further issues arise when L2 speakers' miscues feature sounds that do not exist in English, since RMI instructions for Sound Similarity evaluate how many sounds the miscue has in common with the target word not how similar the produced sounds are to the target. For example, a nonnative speaker in my study produced only the nasal vowel [œ̃], without the initial and final consonants, for the word [nʌn] "nun." Since the production includes a phoneme that does not exist in English, should the production be deemed to have no sound similarity to the target? Or

should it be deemed similar because it includes a vowel that is acoustically close to the English vowel in "nun"?

In scoring Graphic Similarity, a written word and miscue are considered highly similar if they have two letters in common in the same locations. So, "principles" and "principle" are **H** (highly similar) and so are "grounds" and "gypsies," although the former have 9 letters in common and the latter have only 2.

Other coding systems have allowed researchers to code more degrees of Sound and Graphic Similarity. Goodman's (1969) original Taxonomy of Reading Miscues employed scales of 0-9 for *graphic proximity* (see Table 28) and *phonemic proximity* (see Table 29).

Table 28: Goodman Taxonomy of Reading Miscues Graphic Similarity Examples

Points	Example	Points	Example
0	(any with no similarity)	5	pets/puppies
1	zoom/cook	6	quickly/quietly
2	helped/moved	7	saw/was
3	perceive/perhaps	8	batter/butter
4	went/wanted	9	read/read

(Goodman, 1969)

Table 29: Goodman Taxonomy of Reading Miscues Sound Similarity Examples

Points	Example	Points	Example
0	(any with no similarity)	5	unusual/usually
1	saw/was	6	miss/Mrs.
2	kite/cap	7	grow/grew
3	pets/puppies	8	went/wint (schwa)
4	quietly/quickly	9	two/too

(Goodman, 1969)

I did not use the 10-point scale on the data I collected, so I cannot comment about its ability to code L2 miscues accurately, but I still see some issues when I look at this

alternative. For example, the words *was* and *saw* receive a *phonemic proximity* score of 1 but don't have any sounds in common. Their only similarity is that they are one syllable in length and have a single sound in the onset. It is also unclear why *pets* and *puppies* would be more similar to each other than *was* and *saw*. They have one sound in common at the beginning of the word, but their syllable structure has nothing in common. It also seems like *kite* and *cap* should be listed as more similar than *pets* and *puppies*, since the former share one phoneme in the onset *and* have exactly the same syllable structure but the latter share only one phoneme.

The examples given here for *graphic proximity* are plausible in most cases, yet some cases are debatable. For example, the words "zoom" and "cook" are coded as less graphically similar than "helped" and "moved," yet both sets of words have two letters in common, and "zoom" and "cook" also have the same number of letters in each word. The real challenge for coding *graphic proximity,* or Graphic Similarity, however, comes when nonwords are read. All of the miscue examples given by Goodman are real words. When miscues are nonwords, judgments of Graphic Similarity are more difficult. Goodman himself points this out, noting that "[t]his requires, of course, the graphic representation of the O.R.[11]" (p. 21). In other words, the researcher must guess how the nonword would be spelled.

[11] O.R. is "observed response"

3.3.1.4 Grammatical Morpheme Errors in RMI

Studies in second language acquisition (SLA) have shown that grammatical morphemes (e.g., plural *–s*, third person singular *–s*, present continuous *–ing*, etc.) are frequently omitted in second language learners' production of L2 (Jiang, 2004, 2007; Long, 2003). Some research has suggested these morphemes emerge in a sequential order in learners of all ages and across L1 backgrounds (Bailey, Madden, & Krashen, 1974; Dulay & Burt, 1973, 1974; Larson Freeman, 1975). These studies led to the Natural Order Hypothesis, one of the five hypotheses of Krashen's Input Hypothesis (1985), and are used to argue that second language acquisition is similar to first language acquisition and can occur in a naturalistic environment (Krashen & Terrell 1983). Other research suggests that adult L2 learners may persistently omit inflectional morphemes due to fossilization, stabilization (Long, 2003) or inability to integrate L2 knowledge into automatic competence (Jiang, 2004, 2007). The current analysis does not seek to contribute to theories of why such omissions occur but rather argues that omission of grammatical morphemes may be a feature of *interlanguage* (Selinker, 1972) and not an indication that a reader does not understand the semantic content of a root word in text.

Since we usually acquire the grammatical morphemes of our native language by age 4 (Brown, 1973), before we are doing much reading, these types of errors would most likely number a negligible few of native speaker miscues. Goodman and Goodman (2004) found in research with native English speakers that "[t]here is abundant evidence...of readers' strong awareness of bound morphemic rules. Our data on readers' word-for-word substitutions, whether nonwords or real words show that, on average, 80%

of the observed responses retain the morphemic markings of the text" (p. 629). With L2 learners, on the other hand, grammatical morpheme errors make up a significant percentage of the total number of miscues. Of the 3,714 miscues I collected from the adolescent second language readers in my study, 455 (12%) were omissions of the grammatical morphemes: past tense *–ed*, progressive *–ing*, third person singular *–s*, plural *–s*, possessive *–'s*, irregular past, copula, auxiliary, and articles *a*, *an*, *the*). This suggests that grammatical morphemes might need special attention in coding systems used with the second language learner population.

The step-wise coding structure of the RMI causes miscues involving grammatical morphemes to be scored inconsistently. In RMI, a miscue's semantic acceptability is partially determined by the score the miscue receives for syntactic acceptability. This causes some omissions of grammatical morphemes that occur in the middle of a sentence to be scored as demonstrating "Partial loss" in the category of Meaning Construction and "Weakness" in Grammatical Relations, while omissions of grammatical morphemes that occur at the beginning or end of sentences receive scores of "Loss" in the category of Meaning Construction and "Weakness" in Grammatical Relations.

Although Goodman (1969) initially stated: "it is important not to confuse syntactic and semantic change" (p. 25), the RMI states: "Semantic acceptability depends on syntactic acceptability. Therefore, if the miscue is syntactically unacceptable, the miscue is considered semantically unacceptable" (Goodman, Watson, & Burke, 2005, p. 137). A few examples of the way this instruction plays out in my data follow.

On 1/17/12, Bao-yu made the following miscue:

c
|**There's**
|**There**[12]
0103 |"**There's** a person here waiting for you."

According to RMI, before the reader self-corrected, this miscue was coded as **N** "The miscue results in a structure that is not syntactically acceptable" (p. 135) and **N** "The miscue is not semantically acceptable" (p. 135).

On 1/17/12, Bao-yu also made the following miscue:

0301 A better introduction to a new position could
scarily
scare
0302 scarcely be **expected**.[13]

Here, too, the miscue "expect" for "expected" is coded as **N**, **N**. In this case, the following procedures were followed: 1) "We read the entire sentence as the reader finally produced it" (p. 136) *A better introduction to a new position could scarily be expect*. 2)

> If a miscue is found to be syntactically acceptable *within the sentence*, we read the sentence to determine its acceptability within the entire story. If the miscue is acceptable within the sentence and within the entire story, the miscue is coded **Y** (yes). If the miscue is acceptable only at the sentence level, the miscue is coded **P** (partial acceptability)...
>
> If the miscue is found to be syntactically *unacceptable* within the total sentence, the next step is to determine if the miscue is partially acceptable with the beginning of the sentence up to and including the miscue, or from the point of and including the miscue to the end of the sentence. If the beginning portion of the sentence, including the miscue, is not syntactically acceptable, we judge the acceptability of the ending portion of the sentence, including the miscue...If either the beginning of a sentence (including the miscue) or the end of a sentence (including the miscue) is considered syntactically acceptable, the miscue is coded **P**.

---

[12] [ðɛr]

[13] [ɛkspɛkt]

> Miscues that occur on either the first or the last word of a sentence are coded as either acceptable in the whole sentence **P**, acceptable in the whole story **Y**, or unacceptable **N**. Miscues that occur on the first or last words of a sentence cannot be acceptable with only a portion of a sentence (p. 137).

Bao-yu's miscue occurred at the end of the sentence and was not syntactically acceptable within the entire sentence. According to these procedures, it received the code **N** for syntactic acceptability. Finally, as indicated above, since the miscue received a score of **N** for syntactic acceptability, it had to receive a score of **N** for semantic acceptability.

If we accept morphological properties as a component of word knowledge (Qian, 1999), one could perhaps argue that the omission of a grammatical morpheme indicates weakness in one's depth of understanding of the word; however, arguing that Bao-yu had *no* understanding of the word's meaning seems like a stretch, especially since we also see such omissions in oral language, when the L2 learner is not reading a prepared text but creating his/her own productive language.

Students' reflections on this type of miscue also suggest that they may not change their understanding of the meaning of the text. On 5/18/12 Eiko made and corrected the following omission of the copula, which is similar to the one Bao-yu made above:

0732 C
I**There's**[14] no

0733 style to that.

---

[14] [ðɛr]

In our RMA conversation, she explained this miscue by stating "I think I couldn't...I couldn't pronounce this." (And, in fact, this contraction would create a consonant cluster in the rime of the syllable that Japanese phonology does not allow). Eiko thought her miscue might not change the meaning of the text but said she needed to correct it "because it would not be right grammar." Other students responded similarly to oral reading errors involving omission of grammatical morphemes, even when they did not correct them during the reading. Bao-yu produced the following miscue on 5/8/12:

		make[15]
1206	When Peeta and I **made** it into the final eight in	
1207	the Hunger Games, they sent reporters to do personal sto-	
1208	ries about us.	

Bao-yu and I had the following conversation about her miscue during our subsequent RMA session.

Bao-yu:	Did I read make?
Investigator:	You did. So what do you think -
Bao-yu:	It doesn't change meaning.
Investigator:	No it doesn't.
Bao-yu:	And the reason why I read it like that is because I think I didn't read carefully, I think
Investigator:	Umhm. Could be. Does it look the same?
Bao-yu:	Kind of.
Investigator:	Yeah...close. Good. So did you need to fix this one?
Bao-yu:	Yep.
Investigator:	Why?
Bao-yu:	Well no.

[15] [mek]

Investigator: You said it didn't change the meaning.
Bao-yu: No.
Investigator: Yeah. Well, it's past tense and what you read is present tense, so it just changed the grammatical meaning a little bit. Ok.

In this conversation, I encouraged Bao-yu to make a distinction between a complete change in meaning and a change to the tense of the given word. This distinction is also made in the QRI-5 (Leslie & Caldwell, 2011); miscues that involve changes to grammar are counted against the student in the Total Accuracy calculations but not in the Total Acceptability calculations (see section 2.2.4.4 in Chapter 2 for a detailed description of the QRI-5). The original Taxonomy of Reading Miscues (Goodman, 1969) also examined miscues involving inflectional morphemes separately.

The RMI does allow for some miscues involving grammatical morphemes, like Bao-yu's above, to be coded as partially semantically acceptable. In most cases, miscues involving grammatical morphemes occurred in the middle of sentences and could, therefore, be coded as partially syntactically acceptable (**P**) and partially semantically acceptable (**P**). The following is an example of such with explanations of how RMI arrives at the codes.

On 5/13/12 Lan read:

0104 And

0105 everyone knew that Scrooge's [16] name was good.

[16] [skrudʒ]

Following the above procedures, this miscue received a score of **P** (partial) for syntactic acceptability because the first half of the sentence up to and including the miscue is syntactically plausible: *And everyone knew that Scrooge...*, and the second half of the sentence including the miscue is not syntactically acceptable: *...Scrooge name was good.* It then received a score of **P** for semantic acceptability according to the following instructions:

> If the miscue is syntactically partially acceptable (**P**), the miscue may be semantically unacceptable (**N**) or partially acceptable (**P**)...
>
> If the miscue is found to be semantically unacceptable within the entire sentence, the next step is to determine if it is acceptable with the beginning of the sentence up to and including the miscue. If the beginning of the sentence, including the miscue, is not acceptable, we judge the semantic acceptability of the sentence portion from the point of the miscue to the end of the sentence. If only the beginning portion (including the miscue) or only the end portion of the sentence (including the miscue) is judged acceptable, the miscue is coded **P**... (Goodman, Watson & Burke, 2005, p. 138).

Another option might be to deem omission of grammatical morphemes a dialectal feature of L2 learners' *interlanguage*, but this option might also be problematic without additional guidance. First, miscues are deemed dialectal based on what the teacher or researcher has observed in a learner's oral language, and L2 learners may demonstrate morphological variability as their L2 develops (Lardiere, 2005). Furthermore, grammatical morphemes are learning targets for L2 learners in ways dialectal features may not be for speakers of English dialects.

3.3.1.5 Special Errors in RMI Coding

During RMA interviews, ELL readers gave reasons for miscues that were not represented in either coding system. These reasons, fatigue, L3 transfer and prior L2 instruction, go beyond linguistic explanations and hint at sociocultural context and personal experiences as factors in oral reading performance; therefore, it is not surprising they would not be represented in coding systems designed to investigate the cuing systems subjects used as they read. They provide, however, interesting insight into L2 reading and further demonstrate how coding systems may reach erroneous conclusions when they attempt cite a single source of error or make a definitive statement about the miscue's effect on meaning construction.

Affect is one variable that is not captured in RMI coding. As discussed in the RMA study (see Section 2.3.8 in Chapter 2) some ELLs may demonstrate anxiety and hyper vigilance when they read orally in their L2. One student also noted fatigue as a source of a miscue. When I asked Bat about a miscue on 5/11/12, we had the following conversation:

Investigator: Why do you think you left the 'a' out?
Bat: Just…I didn't know that.
Investigator: You didn't know that?
Bat: Yeah. Um… I was so tired… I don't want to read.
Investigator: Yes, you were very tired that day. You did not want to read.
Bat: Yeah.

In RMI, this error was coded as a syntactically acceptable and partially semantically acceptable miscue that resulted in meaning loss and demonstrated partial strength in Grammatical Relations. Although Bat may have omitted the word 'a' because of

linguistic information in the text, his own explanation that his fatigue and disinterest contributed to his performance is certainly viable. Affective variables are widely accepted in the field of SLA as sources of error and appear here to have influenced Bat's reading.

Bao-yu demonstrated how additional languages influence the oral reading of L2 learners. On 3/27/13, Bao-yu read just the nasal vowel, a phoneme that does not exist in English, for the word "nun":

[œ̃]
7013 "You have lived the life of a **nun**.

When we discussed this afterward, she told me she read it this way because it looked like the French word *un* [one] she had just learned in French class. This suggests L3 transfer may also influence L2 reading. RMI codes this error as syntactically acceptable but semantically unacceptable, resulting in scores of "Loss" for Meaning Construction and "Weakness" for Grammatical Relations. Because the French word *un* shares two letters with the English word *nun*, this miscue received a score of "High" for Graphic Similarity. Judging the sound similarity is challenging, however. For a miscue to be coded as demonstrating High (**H**) or Some (**S**) in Sound Similarity, it needs to have sounds in common with the target word. In this case, the miscue has no sounds in common with the target word because the sound pronounced does not exist in English. The information from the RMI appears to be mostly accurate here—Bao-yu does appear to have used orthographic information to read the word, and the meaning of the French word (*one*) did not make sense in the sentence she read.

It is interesting to note that Bao-yu gathered from the context of her reading that Mr. Rochester intended to say that Jane Eyre's life was boring. Although she did not know what the word *nun* meant when I asked her to define it, she was able to construct meaning from surrounding text.

L2 instruction was another unique reason L2 readers gave for their miscues. When I asked Xue about the following miscue:

0601 I was sharing rooms with my friend Sherlock Holmes in **the** ˇ

this [ɛkstraordriən]

0602 Baker Street at the time that these horrible and extraordinary

0603 events took place.

she told me she read the text like this "Because sometimes when I...my writing, my writing habit, I always...'the' in there because maybe when I was in China, when I learn in English my teachers always asked us, put 'the'..." Xue also cited spelling rules she had learned from teachers as information she had used to decode unknown English words.

Eiko also referenced past instruction in our discussions. On 5/9/12 she read:

c

| **stand**[17]

0311 |I couldn't have **stood** it much longer.

The following is a transcript of our follow-up interview about this error:

[17] [stænd]

Investigator: Why do you think you read stand instead of stood?
Eiko: I have no idea.
Investigator: I thought that was interesting. It looks the same a little bit, but it seems like it's probably not just because it looks the same.
Eiko: I think it's like because in my head it is the same like stood and stand. Like when I was in Japan, like when I first studied about the past tense of English, I had to memorize like stand and stood.

Eiko again referenced instruction as a factor when we discussed this miscue from 5/18/12:

		c
		leveryone[18]
0721	They said that if	**leverybody** didn't have
0722	a family to kill, it wouldn't be fair and square to	
0723	the boys that did.	

Our discussion of the miscue follows:

Investigator: Why do you think you read it wrong?
Eiko: It's a different word.
Investigator: Mhm. Why do you think you read the different word?
Eiko: I think because when I learned this word, my teacher told me it's the same as everyone, everybody.

Xue's error and Eiko's two errors received different codes in RMI. Xue's error, though nonnative sounding, and Eiko's second error received scores of "No loss" for Meaning Construction and "Strength" for Grammatical Relations, but only because Eiko self-corrected the second error. If she had not corrected it, saying "stand" for "stood"

[18] /ɛvriwʌn/

would have resulted in scores of "Partial loss" in Meaning Construction and "Weakness" in Grammatical Relations. Eiko's third error of "everyone" for "everybody" also received a score of "No loss" for Meaning Construction, but because she corrected it she received a score of "Overcorrection" for Grammatical Relations.

RMI cannot capture affective or sociocultural influences on oral reading errors. The information it provides in these examples does not contradict the reasons students gave for the sources of their errors, but RMI may stop short of illuminating these influences.

3.3.1.6 Summary of Findings about RMI Coding

In sum, RMI was able to indicate general patterns in the grammatical strength of students' miscues and a coarse representation of the extent to which readers' miscues were phonologically and graphically similar to the target word. The procedures for determining meaning construction in the RMI often resulted in erroneous conclusions. This was in part because of the unique features of second language learners' errors: the mismatch between their ability to decode a word and their understanding of the word's meaning; their nonnative pronunciation of words; and their predisposition to omit grammatical morphemes. Subject interview data revealed some of these problems and also highlighted additional affective and sociocultural variables that affect reading and are not captured in RMI.

3.3.2 Cheng & Caldwell-Harris' Explorations of Oral Reading Errors

Miscue analysis research and theory developed by Kenneth and Yetta Goodman and colleagues (Goodman, 1969; Goodman, Watson, & Burke, 2005; Goodman & Marek, 1996; Goodman, Wang, Iventosh, & Goodman, 2012) and cross-linguistic studies both trace their origins to the field of psycholinguistics, but their research goals and methodology differ greatly. First, though both consider the relationship between oral language and text processing, the cross-linguistic research explored here has focused more attention on the development and use of metalinguistic skills in *decoding* than on the *meaning construction* process RMI explores. Furthermore, while RMI was originally designed to learn how native speakers of English construct meaning from text, cross-linguistic research has focused on metalinguistic skills used in reading different orthographies and the transfer of such skills in L2 reading (Koda & Zehler, 2008). Finally, whereas RMI (despite yielding quantitative data) is largely qualitative and designed for authentic classroom settings, most cross-linguistic studies have used experimental procedures, such as single-word priming, that provide strong internal validity but may lack some task authenticity (Chaudron, 2003; Cheng, 2012).

Despite these differences, at least one cross-linguistic study has also explored oral reading errors as phenomena that can reveal information about reading. Cheng & Caldwell-Harris (to appear) analyzed substitution errors that Chinese and English readers made as they read novel passages aloud from a computer screen in their native languages. To do this they developed a system for coding oral reading errors. Cheng and Caldwell-Harris' system, unlike the RMI, does not attempt to establish *acceptability* of reading

errors, nor does it attempt to draw conclusions about the reader's ability to construct meaning from the text. I will now consider the extent to which Cheng and Caldwell-Harris' coding system is a good match for coding L2 learners' oral reading errors.

In Cheng and Caldwell-Harris' coding system, reading errors are divided into three major groups: pure substitution errors, combined substitution errors and miscellaneous errors. Pure substitution errors demonstrate one kind of linguistic relationship to the target word, semantic, phonological or orthographic. Combined substitution errors demonstrate more than one linguistic relationship to the target word. Miscellaneous errors include insertions, inversions, omissions, morphologically related errors and function word substitutions. See Appendix F for the authors' original coding system and examples from Chinese.

As I applied the coding system to reading errors in English, I realized that there were two distinct types of errors that received the code Combined Substitution Error: Phonological + Orthographic. For example, a reader could substitute the word "hat" with the word "hot". The substituted word is phonologically and orthographically similar to the target word, but there is no clear semantic relation (e.g. thematic, taxonomic) even though the substituted word means something. A reader could also substitute the word "hat" with the word "hapt", a nonsense word. In Cheng and Caldwell-Harris' (to appear) system this would also be coded as "Combined Substitution Error: Phonological + Orthographic." As can be seen in these examples, readers made two different types of errors that fell into the category Combined Substitution Error: Phonological + Orthographic: word- and nonword-errors. To account for this, I added a notation to

distinguish words from nonwords within the category Combined Substitution Error: Phonological + Orthographic. In Figure 5, I have included the same coding descriptors used by Cheng and Caldwell-Harris with English examples from my data that received each code.

Figure 5: Cheng & Caldwell-Harris' Coding with English Examples

(I) Pure Substitution Errors: The replaced words have only one kind of linguistic relation with the target words, either semantic, phonological or orthographic.

> (i) Semantic substitution errors: The replaced words are related to the target words in meaning, without sharing any phonological or orthographic relationship. They could be similar in meaning (e.g., replacement of *I* with *you*), be thematically related, or be taxonomically related (e.g., replacement of *thought* with *see*).
>
> (ii) Phonological substitution errors: The replaced words are related to the target words in pronunciation. They share at least 2 phonemes (e.g. replacing *stuff* with *enough*). There is no semantic or orthographic relation between the replaced words and the target words. (Note: The example given here is not from my data, as there were no pure phonological substitution errors in my data.)
>
> (iii) Orthographic substitution errors: The replaced words are related to the target words in form. They share at least one orthographic component (e.g., replacement of *on* with *one*; replacement of *dice* with [dɛnz] [nonsense word]). There is no semantic or phonological relation between the replaced words and the target words. (Note: As stated above, since some words retained semantic meaning and others did not, I differentiated between those with semantic meaning and those without semantic meaning in my coding.)

(II) Combined Substitution Errors: In this type of error, the replaced words have 2 or 3 kinds of linguistic relation with the target words.

> (iv) Semantic + Phonological substitution errors: The replaced words are related to the target words in meaning and pronunciation (e.g., replacement of 7 (seven) with 11 (eleven) if they are in the text as numbers rather than written out). There is no orthographic relation between the replaced words and the target words. (Note: This type of error is highly uncommon in alphabetic writing systems and did not occur in my data.)
>
> (v) Semantic + Orthographic substitution errors: The replaced words are related to the target words in meaning and form (e.g., replacement of *year* with *week*;

replacement of *not* with *no*). There is not more than one phoneme in common between the replaced words and the target words.

(vi) Phonological + Orthographic substitution errors: The replaced words are related to the target words in pronunciation and form (e.g., replacement of *polite* with [polit] [nonsense word]; replacement of *heart* with *hurt*). There is no semantic relation between the replaced words and the target words. (Note: Since in this error category also some words retained semantic meaning and others did not, I differentiated between those with semantic meaning and those without semantic meaning in my coding.)

(vii) Semantic + Phonological + Orthographic substitution errors: The replaced words are related to the target words in meaning, pronunciation, and form (e.g., replacement of *Mrs*. with *Miss* with; replacement of *poison* with *potion*).

(III) Miscellaneous Errors: Miscellaneous errors including the following error types.

(viii) Insertion: A word was inserted into the passage during reading aloud.

(ix) Inversion: The order of two words was switched.

(x) Omission: A word presented in the passage was omitted during reading aloud.

(xi) Morphological substitution errors: The replaced word is derived from the target word or vice versa (e.g., replacement of *person* with *personality)*. (Note: This error category included errors in both derivational and inflectional morphemes, which may occur for different reasons).

(xii) Function-word substitution errors: A function word (e.g., *the)* is replaced with another function word (e.g., *a)*.

3.3.2.1 Word Knowledge Errors in Cheng and Caldwell-Harris' Coding System

Because Cheng and Caldwell-Harris' system focuses on *how a reader's error is related to the target word* and does not attempt to establish the *acceptability* of the error or its effect on *meaning construction*, it is not necessary to consider word knowledge at

all in coding with this system. All of the reading errors discussed in Section 3.3.1 received the same code in Cheng and Caldwell-Harris' system: Combined Substitution Error: Phonological + Orthographic. In each case, a comparison of the read word and the target word suggests that students' errors are phonologically and orthographically related to the printed word (see Table 30 for target words and reader errors).

Table 30: Errors from Section 3.3.1.2 Coded with Cheng and Caldwell-Harris' System

Target	Reader Error	Code
curtain	[sɝtɪn]	Combined Substitution Error: Phonological + Orthographic
obeyed	[oblidId]	Combined Substitution Error: Phonological + Orthographic
leather	[liðr/]	Combined Substitution Error: Phonological + Orthographic
portfolio	[protafiolo]	Combined Substitution Error: Phonological + Orthographic
sketches	[stɛtʃɪz]	Combined Substitution Error: Phonological + Orthographic

It was not possible to differentiate between word and nonword substitution errors in this system if a substituted word did not have a clear semantic relationship to the target word. I added an additional notation to in my coding when a substitution was a real word, but I couldn't determine a semantic relationship between his production and the target word (e.g., when Xue substituted "particular" for "practically").

Cheng and Caldwell-Harris's (to appear) coding system avoids the problem the RMI faced when it required judgments about semantic acceptability and meaning construction in second language learners' reading errors. At the same time, Cheng and Caldwell-Harris' system is limited in what it can account for. It indicates what strategies or cues may have been used to decode printed words, and potentially does not lead to as many wrong conclusions as the RMI does. On the other hand, it provides no insight into

comprehension and cannot account for errors like the following one that may have stemmed from semantic information at the sentence level but not at the word level.

In her reading of *The Adventures of Huckleberry Finn*, Eiko made the following error:

1619 When-

hockey[19]

1620 ever I got too tired of it I played **hookey**.

The words "hookey" and "hockey" are not semantically related. This error would also receive a code of Combined Substitution Error: Phonological + Orthographic in Cheng and Caldwell-Harris' system because, at the word-level, the two words appear to be related only by orthographic and phonological information. But the word 'play' can co-occur with either word, and the sentence could work with either word. Is it possible that the word "play" prompted the reader to read the name of a sport she knew instead of the word "hookey"? The student revealed in an interview that she knew that hockey was a sport. I would venture that this error was not purely a result of phonological and/or orthographic substitution, but that the meaning of the words and structure of the sentence around the word also contributed to what she read. Sentence-level analysis is not part of Cheng and Caldwell-Harris' coding system, so context cannot be accounted for as a contributing factor in word reading.

---

[19] [hawki]

3.3.2.2 L2 Phonology Errors in Cheng and Caldwell-Harris' Coding System

Cheng and Caldwell-Harris' system, like the RMI, relies on the researcher to indicate if an oral reading error is a product of L2 phonology or a decoding error. In the two examples discussed above, where readers read "smelled" instead of "smiled" they understood the meaning of the target word. These errors are coded here as: Combined Substitution Error: Phonological + Orthographic. As in the RMI, if I had deemed them dialectal variations, they would not have been coded at all. The substitutions of [wɪnd] for [wajnd] and [wɪndɪŋ] for "winding" also received the code: Combined Substitution Error: Phonological + Orthographic (see Table 31).

Table 31: Errors from Section 3.3.1.3 Coded with Cheng and Caldwell-Harris' System

Target	Reader Error	Code
smiled	smelled [smɛld]	Combined Substitution Error: Phonological + Orthographic
smiled	smelled [smɛld]	Combined Substitution Error: Phonological + Orthographic
wind [wɪnd]	wind [wajnd]	Combined Substitution Error: Phonological + Orthographic
[wɪndɪŋ]	winding	Combined Substitution Error: Phonological + Orthographic
[wɪndɪŋ]	winding	Combined Substitution Error: Phonological + Orthographic

Cheng and Caldwell-Harris' system is helpful because its Combined Substitution Error categories do not force the coder to make a choice when the available evidence precludes a choice. At the same time, the assigned code must be interpreted as identifying the *relationship* of the read word to the target word, not necessarily as identifying the *strategy* the reader used to decode the word. Based on the students' reflections on these errors presented in Section 3.3.1.3, it is likely that Chong's

pronunciation of "smelled' in place of "smiled' was a phonological error. He referred to his pronunciation of the error as the problem rather than saying he used words that were spelled similarly (e.g., "find", "mind") to read it. He laughed when he listened to it and realized what he had pronounced sounded more like "smelled' than smiled. On the other hand, Lan and Xue's readings of [wɪndɪŋ] for "winding" seems to be an orthographic error, based on the explanations they gave in their interviews. "Wind" is homographic and can be pronounced in two different ways, depending on context. The students who misread this word revealed use of an orthographic strategy in their interviews.

3.3.2.3 Grammatical Morphemes in Cheng and Caldwell-Harris' Coding System

Cheng and Caldwell-Harris' (to appear) system has two different codes for omission of grammatical morphemes in oral reading: Miscellaneous/Omission Error and Miscellaneous/Morphological Substitution Error. Omission of articles, copula and auxiliary are coded as Miscellaneous/Omission Errors because these are free morphemes. Omission of bound grammatical morphemes and use of present tense instead of irregular past tense are coded as Miscellaneous/Morphological Substitution Errors because "the replaced word is derived from the target word or vice versa" (Cheng & Caldwell-Harris, to appear). The errors examined in RMI were coded as seen in Table 32 in Cheng and Caldwell-Harris' system.

Table 32: Errors from Section 3.3.1.4 Coded with Cheng and Caldwell-Harris' System

Target	Reader Error	Code
There's	There	Miscellaneous/Omission
expected	expect	Miscellaneous/Morphological Substitution

There's	There	Miscellaneous/Omission
make	made	Miscellaneous/Morphological Substitution
Scrooge's	Scrooge	Miscellaneous/Morphological Substitution

Both of these error categories included other types of errors as well. Miscellaneous/Omission Errors included omission of all types, such as the following content word omission made by Ana on 2/10/12:

4401 Calypso walked slowly down to the sea and came upon Odysseus

starting
4402 sitting on the sand, staring across the wine-dark **sea** waters toward

4403 Ithaca.

Miscellaneous/Morphological Substitution Errors included changes in both inflectional and derivational morphemes. This code was also applied both when morphemes were added to words and when morphemes were omitted from words, as can be seen in the following two examples from Marco's QRI reading on 4/6/12:

He

also preferred the guesthouse because it was built

along the bend of the river in Hue, the old imperial

noise[20]
city, and away from the town's **noisy** center. The

/nirbi/
nearby train station was defunct, since the war had

[20] [nɔɪz]

railways[21]
disrupted all but a few **railway** lines.

As noted in Section 3.3.1.4, given the prevalence of this type of error in second language learners' speech, reading and writing, I strongly recommend they be considered as their own separate category in coding and analysis.

3.3.2.4 Special Errors in Cheng and Caldwell-Harris' Coding System

Cheng and Caldwell-Harris' (to appear) coding system focuses primarily on how errors are related to the printed target as a way of understanding what orthographic information readers are sensitive to. Its goal is not to reveal the ways readers construct meaning from text, and, therefore, it does not consider sociocultural or affective variables in reading. Like RMI it did not capture the effect of factors such as fatigue, L3 transfer or L2 learning on reading performance. The codes Cheng and Caldwell-Harris' system assigns to oral reading errors that students attributed to these factors are not erroneous (see Table 33). Rather the difference between the patterns noted in Cheng and Caldwell-Harris' coding system and the interview information reveals the many factors that affect reading.

Table 33: Errors from Section 3.3.1.4 Coded with Cheng and Caldwell-Harris' System

Target	Reader Error	Code
a	--	Miscellaneous/Omission
nun	/ɔ̃/	Pure Orthographic Substitution
--	the	Miscellaneous/Insertion

[21] [relwez]

stand	stood	Miscellaneous/Morphological Substitution
everyone	everybody	Combined Substitution Error: Phonological + Semantic + Orthographic

In other words, Cheng and Caldwell-Harris' system reveals that readers may have used phonological, semantic and/or orthographic information in some cases to arrive at their reading of the text. Again, if Cheng and Caldwell-Harris' codes are read as indicators of how the read word and the target word are related and not as the unequivocal source of the miscue, their system allows us to see patterns in the elements of orthography that second language readers are sensitive to.

As a final note, use of the RMI coding system resulted in some questionable codes for ELLs' miscues but provided a code for all miscues I had recorded. Using Cheng and Caldwell-Harris' (to appear) system, I found twelve substitution errors in my data that did not have a clear corresponding code (see Table 34).

Table 34: Oral Reading Errors with No Code

	Reader	Text	Original Sentence Followed by Student's Version
1	had	for	I understood her very well, **for** I had been accustomed to the quick tongue of my former French teacher. I understood her very well, **had** I had been accustomed to the quick tongue of my former French teacher
2	and	it	**It** had beautifully colored pictures of trains from the first steam engines to the sleek modern diesel engines of today. **And** had been beautifully colored pictures of trains from the first steam engines to the sleek modern diesel engines of today.
3	was	very	It was a fine, calm day, though **very** cool. It was a fine, calm day, though **was** cool.
4	One	But	**But** we see he has broken the elastic and has not troubled to replace it. **One** we see he has broken the elastic and has not troubled to replace it.
5	it	and	He found **and** lit it. He found **it** lit it.
6	that	were	Scattered about the lawn **were** a great many bushes and trees. Scattered about the lawn **that** a great many bushes and trees.
7	of	it	Exploding with a thud, **it** hung from a small parachute and cast a brilliant

			midday light over a large area of the river as it floated down. Exploding with a thud, **of** hung from a small parachute and cast a brilliant midday light over a large area of the river as it floated down.
8	might	only	"That note **only** reached her yesterday." "That note **might** reached her yesterday."
9	he	of	Most of the people in the village fear my stepfather because **of** his violent temper. Most of the people in the village fear my stepfather because **he** his violent temper.
10	you	and	They knew the war to be a misfortune, whereas those who were better off, **and** should have been able to see more clearly what the consequences would be, were beside themselves with joy. They knew the war to be a misfortune, whereas those who were better off, **you** should have been able to see more clearly what the consequences would be, were beside themselves with joy.
11	is	to	While they taught that duty **to** one's country is the greatest thing, we already knew that death-throes are stronger. While they taught that duty **is** one's country is the greatest thing, we already knew that death-throes are stronger.
12	be	do	He was the only one of us, too, who could **do** the giant's turn on the horizontal bar. He was the only one of us, too, who could **be** the giant's turn on the horizontal bar.

Perhaps Cheng and Caldwell-Harris would have coded these oral reading errors as Miscellaneous—Function Word errors. It was not clear what grammatical categories they had labeled as function words, so I considered errors to fall into this category if both the original text and the error belonged to one of the following lexical categories: determiner, preposition, coordinating or subordinating conjunction, relative pronoun, or auxiliary verb. If the Function Word category were extended to include pronouns, copula and weak verbs, it would account for all but numbers 3 and 8 above.

It is interesting that the words students produced in 9 out of 12 of these errors have the same number of letters as the target. Most of them also occur at phrase boundaries (e.g., the beginning of a prepositional phrase, relative clause) or as part of a

conjunction. Goodman and Goodman (2004) suggest that predicting and confirming strategies lead to miscues that "often occur at pivotal points in sentences, such as junctures between clauses or phrases" (p. 624). Perhaps these errors stemmed from students' anticipation of what would come next in the sentence or story and weren't easily codable with Cheng and Caldwell-Harris' system because it does not have a way to take into account the influence of the surrounding text on a reader's errors.

3.4 Discussion

As Goodman (1969) himself states, "in any individual miscue, it is rare that one can say with strong assurance what exactly has taken place" (p. 19). In fact, because of this there are some strengths and weaknesses in each of the systems this dissertation has employed to analyze miscues.

The RMI includes four calculations of oral reading errors: Meaning Construction, Grammatical Relations, Graphic Similarity and Sound Similarity. In terms of the category of Meaning Construction, evidence above suggests that (a) ELL errors often but not always indicate they do not know what a word means, (b) ELLs may decode many words correctly and not know what they mean, and finally, (c) words coded as syntactically and therefore semantically unacceptable in RMI may involve omission of grammatical morphemes and thereby erroneously receive the code "Loss" in the category of Meaning Construction. Although there is some indication that syntactic awareness contributes to reading ability in native speakers (Nagy & Scott, 2004) and that proficient readers make syntactically correct miscues most of the time (Goodman, Watson, &

Burke, 2005), studies of L2 learners' morphological insensitivity (Jiang, 2004, 2007) suggest we may need to exercise caution in assuming the same is true for L2 learners. Given these findings, Meaning Construction calculations with the RMI appear inaccurate when performed on ELLs' miscues.

In terms of Grammatical Relations, RMI provides a general assessment of the grammaticality of readers' errors. When errors are not syntactically acceptable for the sentence, the error receives a score of "Weakness" in the RMI coding system. It should be noted that this system does consider syntactic and morphological errors to be more detrimental to Grammatical Relations than semantic errors.

In terms of Graphic and Sound Similarity, the current RMI protocol provides only a limited analysis. Problems calculating these constructs have existed in miscue analysis for quite some time and have been noted in Leu (1982), who reviews an array of formulae and scales that have been used to determine graphic similarity in miscue analysis. On the whole, I would agree with Leu in his assessment:

> Missing from most investigations of oral reading errors...are justifications for decisions concerning the definition and categorization of errors. Until greater discussion of the rationale behind these decisions takes place, the lack of agreement about what to count and how to count will continue to plague this research methodology (p. 428)

If RMI is to be used with ELLs, those implementing the procedure need to first reconsider the assumption that reading a word correctly is an indication that the reader

knows what it means. "Unlike first language readers, who are usually able to access the meaning of a word once the word is phonologically decoded, second language readers tend to have a smaller oral vocabulary...and, therefore, successful word decoding in a second language does not guarantee access to meaning" (Kuo & Anderson, 2008, p. 53-54).

Second, if RMI is to be used with ELL readers, the procedures need to be adapted to provide guidance for evaluating the extent to which errors stem from L2 phonology. A thorough understanding of the L2 learner's L1 phonology and comparative samples of oral language would help in this determination, especially if L2 subjects had a high proficiency in English (L2) and a relatively stable L2 phonology. Receptive vocabulary for which no corresponding oral language sample existed might still be challenging for the researcher to code. And, in some cases, it may be impossible to differentiate between a nonnative pronunciation of a word and an oral reading error.

Finally, I strongly suggest that special attention be paid to ELL readers' oral reading errors involving grammatical morphemes. A significant number of miscues of this type (12%) were observed in the data, and research in SLA suggests the origin of this error may differ from that of other errors. It may be more appropriate to analyze these errors separately or even to consider these miscues as "dialectal" features of interlanguage rather than as oral reading errors. Neither coding system isolated such miscues for separate analysis.

Cheng and Caldwell-Harris' (to appear) system, in its simplicity, is a useful instrument for identifying general patterns in oral reading errors. Of the 3,714 errors I

coded, only 12 seemed difficult to code in this system. Its ability to code substitutions as "Pure" or "Combined" does not force a coding choice when data is inconclusive, and it avoids problematic gradations of graphic and sound similarity and judgments of acceptability.

Because the researchers' original goal in developing this system was to examine semantic substitution errors in Chinese readers, the system may need adjustments for use with English readers (both L1 and L2). When they used these codes with native English readers, for example, they found that 67.5% of errors were Miscellaneous. This was further broken down into 37.6% Morphological and 32.3% Omission, but if two-thirds of English readers' miscues were coded as Miscellaneous in a system that aspires to the larger goal of learning how readers retrieve information from print, there is probably great potential for deeper analysis of the Miscellaneous category. As I will discuss in Chapter 4, this outcome may be due to the differences in Chinese and English orthographies.

Furthermore, as I pointed out above, for L2 readers it might be meaningful to look at omission of bound and free grammatical morphemes a distinct category.

Interview data provided useful insights into reader errors, though interviews cannot tell the whole story. Since RMA interviews are conducted some time after the reading takes place, readers may forget what they were thinking at the time. We must also remember that readers may not always be consciously aware or have declarative knowledge of all of the information they are processing as they read. For example, L2 readers often told me they could not read a word because they did not know it, but in fact

were able to tell me something about its grammar or make an attempt at its pronunciation. This indicates that they continued to use linguistic information from the text at these times. In other cases, low proficiency L2 learners may not have been able to adequately explain their thinking about miscues to me in their L2 English.

From a sociocultural standpoint, it is also interesting to note that ELL students' oral reading may be influenced by L3 transfer and factors beyond the scope of linguistic analysis, such as prior L2 instruction and fatigue.

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CHAPTER 4: PATTERNS IN ELL STUDENTS' READING ERRORS: WHAT CAN THEY TELL US ABOUT THE INFLUENCE OF L1 ORTHOGRAPHY IN DECODING L2?

4.1 Background

Cross-linguistic research in reading has explored the way different orthographies encode language, the extent to which this hones metalinguistic skills (i.e., phonological, morphological, syntactic and semantic awareness), and how text activates linguistic information during the reading process. Koda and Zehler (2008) examine how such differences in first language experience influence second language reading and argue that one's "metalinguistic competencies are assumed to reflect the specific ways spoken language elements are graphically represented in the writing system" (p. 5) in which one learned to read.

Most models of reading development suggest that word reading is a function of interaction between three main components: phonology, orthography and meaning (Seidenberg & McClelland, 1989; Coltheart, Rastle, Perry, Langdon, & Ziegler, 2001). Seymour's (1990, 1997, 1999) foundation literacy framework suggests that phonological and morphological awareness (which he terms "alphabetic process" and "logographic process") are co-contributors to orthographic development. According to this model, the "logographic process" is used in identification and storage of familiar words, and the "alphabetic process" is used for sequential decoding; furthermore, small units

(phonemes) are emphasized during Phase 1 of reading acquisition and larger units (rimes, syllables and morphemes) are acquired in later phases (Seymour, Aro, & Erskine, 2003).

All writing systems represent the phonological qualities of words in written symbols (Holm & Dodd, 1996) and "use phonological codes to access short-term memory" (Mori, 1998, p. 72), but alphabetic orthographies, with which most reading research has been conducted, differ from others in two important regards. First, an alphabetic writing system has orthographic symbols, which ideally represent a single sound, and second, when viewed in isolation, these orthographic symbols carry no semantic meaning (e.g., English /k/ represents a sound only). When letters are combined they form words with semantic properties (e.g., English "cat" (/kæt/) combines three letters, corresponding to three phonemes: /k/, /æ/ and /t/, to form the meaningful word *cat*).

Høien, Lundberg, Stanovich, and Bjaalid (1995) suggest that as a result of the nature of reading in an alphabetic orthography, readers of alphabets may develop the metalinguistic skill of phonemic awareness, a distinct subcategory of phonological awareness. Høien, Lundberg, Stanovich, and Bjaalid's hypothesis is a result of linguistic analysis indicating that phonemes are not salient in speech production or speech perception in the way other units, such as syllable and rime, are; rather, phonemes are units individuals become aware of as they gain experience reading an orthography that accentuates them. Öhman (2002) goes as far as to say that "no such 'segmentation' can be observed in fluent speech, even by means of modern instrumental-phonetics methods" (p. 103) and concludes that:

> [t]he *segmental-phonemic structure* of speech that may seem to be presupposed by the most widespread and best known kinds of phonographic (alphabetic) writing consequently does not reflect any *universal intrinsic structure* of speech. I.e. in other words, we cannot assume that speech *already, in and of itself, possesses* a certain sound structure that the scribes, so to speak, *revealed to the world*. Rather, acoustically formless speech turned out to be phonetically codable in the way the ancient scribes did it. They did not 'discover' the phoneme, they *invented* it. (p. 102)

Studies of phonological awareness in children learning to read also demonstrate a reciprocal relationship between phonemic awareness and decoding that first emerges in most children with exposure to the alphabet (Liberman, Shankweiler, Fischer, & Carter, 1974; Treiman & Zukowski, 1991).

Chinese writing, on the other hand, may cause readers to pay attention to other linguistic aspects. Cheng and Caldwell-Harris (to appear) showed in one study that Chinese readers made 20 times more semantic substitution errors than the English readers; whereas, English readers made significantly more phonological errors than the Chinese readers. These findings suggest that semantic information may be more transparently encoded in Chinese text than phonological information and is therefore more strongly activated; whereas, English activates phonological information more strongly than semantic information.

How universal, then, are specific metalinguistic skills in reading when we begin

to include non-alphabetic orthographies in reading models? One goal of cross-linguistic research is to determine the extent to which such processes are universal versus the extent to which they are affected by the orthography an individual reads. If one has learned to read a transparent, alphabetic orthography such as Spanish, is he or she more likely than someone who learned a deeper orthography such as English to "treat a string of letters as decodable" (Perfetti & Dunlap, 2008, p. 19)? Are Chinese readers more sensitive to morphological or semantic information than phonological information when they read? And, if so, what happens when a Spanish or Chinese reader who has learned one kind of writing system starts to read in a second? It is the last of these questions on which this study will focus.

Using a wide variety of methodologies, three major theories—the Dual Route Cascaded (DRC) model (Coltheart, Rastle, Perry, Langdon, & Ziegler, 2001); the Universal Phonological Principle (UPP) (Perfetti, Zhang, & Berent, 1992); and the Transfer Facilitation model (Koda, 2008a)—have attempted to answer questions about reading universals and the uniqueness of reading in different orthographies. I will first summarize each of these theories. Next, I will discuss the relevant features of the focal writing systems of this study, Chinese and Cyrillic. Third, I will highlight relevant findings on the transfer of metalinguistic skills in L2 reading and discuss studies that explored errors as a way of understanding the L1 reading skills readers bring to reading in their L2. Finally, I will discuss my own research on L2 oral reading errors in an authentic classroom context and how analysis of these errors may contribute to existing theory and research.

4.1.1 The Dual Route Cascaded Model (DRC)

The DRC (Coltheart, Rastle, Perry, Langdon, & Ziegler, 2001) model of visual word recognition and reading aloud is a computational model of a theory of word reading. The model has three routes from the printed word to speech: the lexical semantic route, the lexical nonsemantic route, and the grapheme-phoneme routes. These are theorized to correspond to two types of decoding: lexical or sublexical decoding. In the sublexical route, letters are mapped to phonemes and then to words. In the lexical route letters are not read individually, but rather a full-word letter pattern results in word retrieval. The sublexical route activates phonology before meaning in a "cascaded" fashion and is useful for reading words that have reliable grapheme-phoneme correspondence. The lexical route is used for words that are not phonetically regular (those sometimes referred to as "sight words" by teachers) and activates phonology in a threshold style.

Research with native English speakers suggests that sublexical processing may not always proceed letter-by-letter as the DRC proposes, but that readers become sensitive to larger phonological units such as rimes (Treiman, Mullennix, Bijeljac-Babic, & Richmond-Welty, 1995) and syllablelike subunits (Taft, 2002).

According to Perfetti and Dunlap (2008), different error types will be seen in reading, depending on the strategy a reader employs:

> "The lexical strategy leads readers, when they make errors, to respond with real words based on shared letters or partial visual overlap with the target word, for example, responding 'near' for the word 'never.' The

sublexical strategy leads to errors with high phonemic overlap with the target word, even when that means producing non-words (Ellis & Hooper, 2001)." (p. 27)

4.1.2 The Universal Phonological Principle (UPP)

The UPP (Perfetti, Zhang, & Berent, 1992) is based on reading research in a variety of languages that suggests readers do not interact with printed words as signs with meaning in a "visual-to-meaning process" (Perfetti & Liu, 2005) but depend on spoken language to understand print. Printed words activate language information about the word, including its meaning and its sound. This notion is the reading universal known as The Language Constraint on Writing Systems, and it includes the Universal Phonological Principle (UPP), which states that all languages activate phonology at the level it is encoded in the writing system. For some writing systems that may be the phoneme, for others it may be the syllable, morpheme or word. This hypothesis does not consider phonological activation in terms of lexical activation but rather as a constituent of overall word recognition; phonology or meaning may be activated first, but for orthographic recognition phonology must be activated (Perfetti & Dunlap, 2008; Perfetti & Liu; Perfetti, Zhang, & Berent).

In terms of the Dual Route Cascaded (DRC) model (Coltheart, et al., 2001) Perfetti and Dunlap (2008) argue that reading Chinese characters (see Section 4.1.4 for a detailed description of the Chinese writing system) results in threshold style activation of phonology; orthographic identification is followed by activation of phonology at the

syllable level. On the other hand, alphabet reading can activate phonology before orthographic identification is complete. As individual letters activate the phonological information (at the phoneme level) that they correspond with, phonological activation "cascades" during the reading of a word. For example, in reading the word "cat", the letter "c" activates the phonological entity /k/ first; when the final letters "a" and "t" are decoded, the meaning of the word "cat" can be identified.

The role of larger phonological units is not outlined in this hypothesis, but it proposes an explanation for how phonology is activated, and activated differently, in diverse writing systems.

4.1.3 Transfer Facilitation Model

The Transfer Facilitation Model, developed by Koda (2008a), provides a theory of how metalinguistic skills from reading in a L1 are used and developed in reading a L2. The theory includes the following premises:

- Reading skills transfer across languages.
- Children form sensitivity to the regularities of spoken language during oral language development.
- Writing systems are structured to capture these regularities.
- Learning to read involves learning to map spoken language elements onto graphic symbols in the writing system.
- Metalinguistic awareness precipitates the initial phases of learning to read by enabling the learner to analyze spoken words into their constituent elements.

- The awareness becomes increasingly explicit through cumulative print processing experiences.
- The resulting metalinguistic awareness reflects the specific ways in which language elements are graphically encoded in the writing system, and therefore, varies systematically across languages (Koda, p. 77).

The Connectionist extension of this theory is that reading develops form-function relationships through cumulative experience; reading knowledge or skill thereby initially requires deliberate effort but through repetition becomes automatic. In a Connectionist framework "transfer can be defined as an automatic activation of well-established first-language competencies, triggered by second-language input" (Koda, p. 78). If this is true, transfer should not decrease during L2 development but should gradually adjust to the target L2, and this adjustment should take longer when there is greater distance between L1 and L2. This conjecture remains to be proven, as longitudinal studies have not been conducted.

4.1.4 Reading in Chinese

Chinese is a logographic (or morpho-syllabic) writing system, which means that unlike an alphabet, which maps graph to phoneme (e.g., the letter 'b' maps to the sound /b/), Chinese maps graph to word or morpheme (e.g., 马, pronounced ma/3, means "horse") (Perfetti & Dunlap, 2008). In the cases of an alphabet, an individual graph, such as "b" above, carries phonological information but no semantic information, so a reader decoding an alphabet activates phonology before orthographic identification of the word

is complete. On the other hand, a Chinese character does "not allow phoneme-level mappings to function in either learning to read or in skilled reading. Instead, [it] allow[s] reading to proceed from graphic form to meaning and from graphic form to syllable" (Perfetti & Dunlap, 2008, p. 19). Whereas the graphic forms of an alphabetic orthography map only to phonemes and must be combined into morphemic chunks to have semantic meaning, the graphic forms of a logography map both to meaning and pronunciation. Although this may seem novel to English-speakers, sight words in English are read in much the same way Chinese readers read characters; they are not sounded out but instead are read as whole words.

A logographic writing system such as Chinese has characters rather than letters; the characters represent syllables, and they also carry semantic meaning. Each Chinese character is pronounced in Mandarin Chinese with a single syllable and, with the exception of a few grammatical particles, is differentiated by one of four tones. There are many homophones in Chinese; there are only 1,200 syllables (and, in fact, only approximately 400 syllables if tones are excluded as a distinction) but nearly 7,000 morphemes (Li, Anderson, Nagy, & Zhang, 2002; Shu, Chen, Anderson, Wu, & Xuan 2003) and an estimated 50,000 characters (Taylor & Taylor, 1995; Shu et al., 2003). In fact, an interesting feature of written Chinese is that "it serves to differentiate morphemes that are homophones in the spoken language. With few exceptions, each morpheme is written with its own unique character" (Li, Anderson, Nagy, & Zhang, 2002, p. 90). For example, the Chinese words for "he", "she", and "it" are all pronounced ta/1 in Mandarin, but they are written as 他, 她, and 它, respectively. Most Chinese words are comprised

of multiple characters, and these combinations can be transparent or opaque; sometimes each character in a word retains its semantic content and contributes to the meaning of the word, and sometimes the relationship between the word meaning and one of the characters is not direct. For example, in the word for "girl" 女孩子 (pronounced nü/3 hai/2 zi), the first character, 女, means "female", the second character, 孩, means "child," and the final character, 子, also means "child." This word is transparent. But in the word for *house*, 房子 (pronounced fang/2 zi), the meaning of 子 ("child") does not relate directly to the meaning of the word.

A small percentage of Chinese characters can still be considered pictographs; that is, their shape suggests, or at one time suggested, their meaning. The character 木 (pronounced mu/4), for example, means "wood" and resembles a tree. Ideographs are another type of character in Chinese that are visually meaningful because they suggest their meaning. For example 上 (pronounced shang/4) and 下 (pronounced xia/4) mean "up" and "down" respectively. This is suggested by the direction in which their vertical stroke points. The majority of Chinese characters, about 82%, are standard compound characters. They have two parts: a semantic radical and a phonetic. The radical, usually found on the left-hand side of the character, carries semantic information; the phonetic, usually found on the right-hand side of the character, carries phonetic information. For example, the characters for "mother" 妈 (pronounced ma/1), "sister" 姐 (pronounced jie/3) and "grandmother" 奶奶 (pronounced nai/3 nai/3), all have the radical 女 ("female") on the left-hand side. On the other hand, 妈 ("mother", *pronounced ma*/1), 马

("horse", pronounced ma/3), and 吗 (a question word, pronounced ma) all have the phonetic 马 on the right-hand side because they are all pronounced as the same syllable, albeit with different tones.

Although the phonetic component may give a clue about pronunciation, it is not reliable most of the time. In Yin's (1991) analysis of Chinese phonetics, "36% give clear information about a character's pronunciation, 48% give partial information, and 16% give no useful information" (Shu & Anderson, 1997, p. 3). The results of Shu, Chen, Anderson, Wu, and Xuan's (2003) study of a corpus of the 2,570 characters taught in Chinese elementary schools illustrates the unique irregularity of Chinese phonetics:

> First, the pronunciation cues within characters are complicated. There are 650 phonetic components in the standard phonetic compound characters in school Chinese. This total does not include the 370 "other" compound characters with obscure or ambiguous pronunciation cues or the 720 nonphonetic characters that contain no cues. Second, the productivity of phonetic components is low. Nearly half (46%) of the independent phonetics appear in only one compound character in the corpus. Only a few (10%) appear in more than four characters. The median size of phonetic families in the corpus is just three characters. Third, the regularity of pronunciation of compound characters is low. Only 23% of compound characters are perfectly regular, whereas an additional 16% are regular except for tone. Fourth, the pronunciation of characters with the same phonetic is often inconsistent. Depending on the grade, the average consistency in pronunciation of characters within phonetic families ranges from 61% to 73%. Finally, other complexities may interfere with identifying and using pronunciation cues. Among the standard semantic-phonetic compound characters in the corpus, 83% have a phonetic component that can appear in different positions within a character; 14% have phonetics that can serve as radicals in other characters; and 8% have bound phonetics without determinate, independent pronunciations. (p. 42)

Although this may make decoding characters seem complex and unreliable to people accustomed to an alphabet, some of the same features (many-to-one mappings, one-to-

many mappings) are true of deep, alphabetic orthographies, such as English, albeit to a lesser extent.

Both Chinese and English have inflectional, derivational and compound words (see Table 35 from Ku, & Anderson, 2003, p. 406), but English has many derivational words, whereas Chinese uses many compound words formed with bound roots. Word formation in English may involve phonological or orthographic changes, but this is rare in Chinese word formation. "[A]pproximately 89% of Chinese characters represent unique morphemes, [so] characters usually provide the reader with visually distinct and reliable cues for decomposing polymorphemic words (Ku & Anderson, 2003, p. 406).

Table 35: Types of Morphemes and Examples in Chinese and English

Morpheme Type	**Chinese**	**English**
Root word	山/shan1/ (mountain) 狗/gou3/ (dog)	Book Hand
Bound root	房/fang2/ (house) 桌/zhuo1/ (desk)	Anti- (against, opposite) -logy (study)
Inflectional affix	了/le/ verbal aspect 门/men/ plural	-ed (past tense) -s (plural)
Derivational affix	无/wu2/ (not) 化/hua4/ verbalizing	-er (agentive) -ly (adverb)

(Ku & Anderson, 2003, p. 406)

Instruction is another variable in how one approaches text, and reading is taught differently throughout China. In Mainland China and Taiwan, children learn to read Chinese characters with the assistance of an alphabetic writing system, Pinyin or Zhu-Yin-Fu-Hao, respectively. Pinyin is described by the Beijing Languages Institute (1989) as "a set of symbols used to transliterate Chinese characters and combine speech sounds of the common speech into syllables" (p. 37). In Hong Kong, characters have historically

been learned through copying and memorization, without the accompaniment of Pinyin or Zhu-Yin-Fu-Hau (Huang & Hanley, 1995).

4.1.5 Reading in Alphabets

Although grapheme-phoneme correspondence is the basis for all alphabetic writing systems, alphabetic orthographies vary in the extent to which sounds and letters have one-to-one mappings. For example, in English, although words like *cat*, *dog*, and *ant* can be easily "sounded out" if one knows the sound each letter makes, other words like *enough*, *physique* or *circus* have spellings less transparently linked to pronunciation. The English writing system is orthographically deep, in some cases, because it preserves and represents morphemes at the expense of consistent grapheme-to-phoneme correspondence (Chomsky & Halle, 1968; Mahony, Singson, & Mann, 2000; Templeton & Scarborough-Franks, 1985).

Transparent (or shallow) orthographies, such as Italian, Finnish, German, Spanish, and Korean have more regular grapheme-to-sound correspondences, and opaque (or deep) orthographies, such as English, French, Arabic, Hebrew and Khmer, have less reliable correspondences[22]. Experienced readers of shallow orthographies tend to approach letter strings as decodable and make more non-word errors than readers of deep orthographies, who may learn to apply an orthographic whole-word reading approach and make more real word errors that look similar to the target (Frith, Wimmer, & Landerl, 1998; Landerl & Wimmer, 2000; Wimmer & Goswami, 1994).

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[22] Arabic and Hebrew are considered deep orthographies when they are written without vowel diacritics.

English-speaking children are often taught to read with decodable texts that have regular, predictable grapheme-to-phoneme mappings and are accompanied by phonics lessons (Messmer, 2001). This instructional method develops their use of letter-sound decoding strategy (Juel & Roper-Schneider, 1985). But Mora (2001) estimates that only 75% of written words in English can be decoded with phonics generalizations, and research on 8-year-old children suggests that training in morphological awareness also improves even these relatively young readers' word reading and spelling skills (Carlisle, 2010; Nunes, Bryant, & Olsson, 2003). Research suggests that as English readers become more proficient they use more than sound-symbol correspondence to decode, attending to larger phonological units (Treiman, Mullennix, Bijeljac-Babic, & Richmond-Welty, 1995), morphemes and/or whole words.

4.1.6 The Cyrillic Alphabet

Cyrillic is an alphabetic writing system that is the official alphabet for a number of languages, including Bulgarian, Mongolian and Russian. I focus on these three orthographies since they were read by my subjects. Each orthography has some irregularities in grapheme-phoneme correspondence, but they are all shallower than English. Based on differences noted above that have been observed in readers of shallow versus deep orthographies, Cyrillic readers would be more likely to approach letter strings as decodable than readers of English because Bulgarian, Mongolian and Russian are shallower orthographies. Shallow orthographies have more regular grapheme-phoneme correspondence, or small-grain-mapping, whereas English readers "may use a

larger portion, or 'grain size,' of the printed word to map onto spoken language" (Perfetti & Dunlap, 2008) instead of a letter-by-letter decoding approach.

4.1.7 Reading English as a Second Language

Studies of cross-linguistic transfer investigate which aspects of reading are shared, underlying competencies and which are language specific. In addition to furthering theory, these studies can inform classroom practice by identifying the parts of reading that will require new learning and the parts that students (especially older accomplished L1 readers) will come knowing.

The bulk of studies on transfer in reading have inquired into the role of phonological awareness and investigated whether young second language learners learning to read demonstrate cross-linguistic transfer of phonological processes and/or increased phonological sensitivity (Abu-Rabia, 1997; Bialystok & Herman, 1999; Bialystok, Majumder, & Martin, 2003; Bialystok, McBride-Chang, & Luk, 2005; Branum-Martin et al., 2006; Cisero & Royer, 1995; Durgunoglu, Nagy, & Hancin-Bhatt, 1993; Leafstedt & Gerber, 2005; Loizou & Stuart, 2003; Quiroga, Lemos-Britton, Mostafapour, Abbot, & Berninger, 2002; Schiff & Calif, 2007; Wang, Perfetti, & Liu, 2005). This research repeatedly suggests that phonological awareness is an underlying cognitive process that is not language specific, but is more easily shared when the individual's two languages have similar sound systems.

On the other hand, orthographic knowledge—the understanding of how a writing system's graphic symbols encode spoken language and are combined—appears to be

more language specific (Wang, Park, & Lee, 2006). Orthographic knowledge develops as readers experience accurate decoding and form associations between a word's visual representation and its phonological representation in memory (Stanovich, 2000). Grapho-phonological awareness[23] is much more influenced by L1 reading experiences than phonological awareness, requiring "insight into how orthography encodes phonological information" (Kuo & Anderson, 2008, p. 53). And this distinction between phonological and grapho-phonological awareness is crucial in the study of skill transfer for readers from distant orthographies because "phonological awareness, presumably non-language-specific, is readily functional in any additional languages, grapho-phonological awareness could only provide limited support in learning to read in another language" (Koda, 2008b, pp. 225-6).

Since the Chinese writing system is quite different from alphabets, it provides an opportunity to test these theories of transfer. In fact, cross-linguistic transfer of metalinguistic skills has been less apparent in Chinese readers of English than it has been in alphabet readers (e.g., Spanish) of English. Most studies suggest that phonological awareness in Chinese (L1) does transfer to English (L2) tasks, but transfer is less robust because the two languages have dissimilar sound and writing systems. For example, a study of Chinese kindergarteners (Chow, McBride-Chang, & Burgess, 2005) found that Chinese native language phonological awareness contributed to early English word recognition, even when visual skills were taken into account. On the other hand, a three-way comparison of 6-year olds in Singapore conducted by Liow and Lau (2006) found

[23] Grapho-phonological awareness is a subcomponent of orthographic awareness (i.e., the awareness of how a writing system encodes phonological information).

that children speaking English or Bahasa-Malaysia, a language with an orthographically transparent alphabet, demonstrated greater application of phonological awareness in early English spelling than did first language speakers of Mandarin.

Wang and Geva (2003b) found both positive and negative L1 transfer effects in Chinese children learning English as a second language. When compared to native English-speaking children on five tests: real word spelling, pseudoword spelling, confrontation pseudoword spelling, spelling selection, and vocabulary, the Chinese children did not differ from the English-speaking children on real word spelling but differed considerably on pseudowords. Furthermore, for the English-speaking children there was no significant difference in spelling of real and pseudowords. This suggests that the Chinese children may have applied a whole-word strategy from their first language literacy experience to learning the spellings of words in English. Positive transfer of visual processing skills developed in Chinese literacy experience was also observed: Chinese children were better able than English-speaking children to recall visually presented letter strings in the confrontation pseudoword spelling task, especially when the strings were orthographically illegitimate. English-speaking children's spelling performance was impaired when they could not phonologically recode an item.

Leong, Hau, Cheng, and Tan (2005) designed a study similar to Wang and Geva's (2003b) with older children (average age 9.88). A battery of orthographic knowledge and phonological sensitivity tasks and two indicators each of word reading and spelling were administered twice within one year. The results of this study also demonstrate that Chinese children relied on orthographic knowledge more than phonological sensitivity to

identify words. The correlation between orthographic knowledge and word identification at Time 1 was .917. The correlation between phonological sensitivity and word identification was .722. The correlation between orthographic knowledge and phonological sensitivity was .604.

Metalinguistic skills continue to differ across languages in adulthood. Holm and Dodd (1996) administered a series of tests to college students from the People's Republic of China, Hong Kong, Vietnam and Australia, who were studying at University of Queensland in Australia. The subjects were tested for phonological awareness, real- and pseudo-word reading, and spelling abilities in English. The Hong Kong students, who had learned to read in a non-alphabetic orthography, without exposure to Pinyin, exhibited limited phonological awareness, while students from the People's Republic of China, who had learned Pinyin, and students from Vietnam, who had learned to read in an alphabet, performed better. Specifically, the Hong Kong subjects found rhyme detection, phoneme segmentation, and spoonerisms more difficult than students from the other linguistic backgrounds, and their errors were often tied to orthographic strategies. The Hong Kong Chinese group also exhibited more difficulty in reading and spelling nonwords than the other ESL students. Yet, all four of the ESL groups were highly literate, had achieved at least a 6.5 on the International English Language Testing System (IELTS) or had earned a Secondary Senior Certificate in Australia. Furthermore, the different groups scored within 2% of each other on the real-word reading task administered in the study. This led the researchers to conclude: "the development of phonemic awareness seems to be dependent upon alphabetic acquisition, or another form

of explicit phonemic instruction" (p. 139); furthermore, the alphabetic principle may not be essential for successful reading and spelling in English.

Koda (1998) also investigated differences in phonemic awareness in adult English language learners from China but compared their skills to Korean learners'. Like Holm and Dodd (1996), she included subjects who had learned to read Chinese without an alphabetic script, and she used Koreans as a comparison group because Hangul, though an alphabet, has a spatial organization that is more similar to Chinese than English does. All of her subjects were enrolled in a beginning level ESL intensive language program at the university level. The subjects were administered four tests of phonemic awareness, two decoding tests, and two tests of reading comprehension. In this study, quantitative differences in Korean and Chinese subjects' performance on phonemic awareness tasks were not significant; however, debriefing interviews conducted after the phoneme deletion task revealed use of different strategies in the two groups. Thirty percent of the Chinese subjects said they used visual strategies to picture the words, but only one Korean reported doing this. On the other hand, 12 Koreans reported use of phonological strategies to "sound out" the word, and only three Chinese subjects reported use of this strategy. On the reading tasks, homophone detection and Word Attack, the subjects did not differ in performance, but there was a great difference between the overall correlation between these two skills and phonemic awareness in the two groups. In Word Attack, there was a .71 correlation with phonemic awareness for Chinese speakers, compared to a .47 correlation for Korean speakers. In homophone detection, there was a .27 correlation with phonemic awareness for Chinese speakers, compared to a .50 correlation for Korean

speakers. Furthermore, although phonemic awareness and decoding correlated strongly with reading comprehension for Korean subjects, there was no clear connection between these variables and reading comprehension for the Chinese subjects.

These studies indicate a) orthographic knowledge is more language specific than phonological awareness and is shaped by the orthography in which one learned to read b) Chinese readers may employ whole-word reading and visual processing skills more than alphabet readers. There is still some question as to how much Chinese readers can transfer from Chinese reading to alphabet reading. Psycholinguistic research has also used lexical experiments to determine when and how phonology and semantic information is activated in L2 readers.

4.1.8 Lexical Experiments

Psycholinguistic researchers have used a variety of lexical experiments, including priming, category judgment, backward masking and repetition blindness, to discover what readers are sensitive to as they are confronted with text.

Wang, Koda, and Perfetti (2003) investigated processing differences in intermediate and advanced Korean and Chinese adult ESL learners' reading in English with a unique semantic category judgment task developed by Van Orden (1987). In this task, subjects judged whether a word (e.g., "rows") belonged in a category (e.g., "flower"). The incorrect stimuli had either phonological or spelling similarity to category stimuli. The researchers looked at subjects' reaction times and error rates in selecting homophones and spelling controls as false positives in category judgment and found that

Korean subjects erred more on homophone foils than spelling controls, but Chinese subjects were not significantly affected by homophone interference, rather words spelled very similarly to the target category member resulted in more incorrect judgments. Because there was some effect from homophone interference in Chinese readers of English, the researchers concluded that both transfer from the first language and the nature of the second language contribute to second language reading.

Although the subjects in Wang, Koda, and Perfetti's (2003) work were intermediate and advanced level students, they hypothesized, in accordance with the Transfer Facilitation Model, that over time "the effect of phonology on English word processing [would] eventually prevail in Chinese L2 readers' performance. The differences between the two language groups [would] decrease" (p. 144). In a search of the ERIC database for longitudinal studies of cross-linguistic transfer in reading, I found only one study to date, and it examined phonemic awareness in young children who spoke Hebrew and Russian.

In a series of experiments Cheng (2012) used priming and repetition blindness paradigms to show that readers may transfer L1 semantic and phonological activation patterns to reading in L2. She found that only Spanish (L1) subjects showed phonological inhibition effects and only Chinese (L1) subjects showed semantic priming effects in the sentence-based priming paradigms. The phonological repetition blindness effects were also stronger in the Spanish groups; and the semantic repetition blindness effects were only present in the Chinese group. Taken together, these results suggest phonological, orthographic and semantic transfer from L1 to L2 reading. Furthermore,

since all of Cheng's subjects were advanced L2 speakers of English, it appears that transfer effects are still noticeable even when L2 is well established.

4.1.9 The Scope of the Current Study

The current study is different from those described above in its methodology. Unlike the experimental studies discussed in the literature review, I collected data with case studies of L2 learners in a school setting as they performed authentic oral reading of connected text. Furthermore, this study was conducted with adolescents, a population not represented in any of the research discussed above. Due to the significant number of errors I collected from the subjects' oral reading samples, I was able to document patterns in their reading.

First, I wanted to see if L2 readers of English look like native-English-speaking readers of English in terms of the types of errors they make. I used a system developed by Cheng and Caldwell-Harris (to appear) to code the 3,714 errors that the nine L2 readers in my study had made. Cheng and Caldwell-Harris' system was developed for coding errors English and Chinese readers made while reading in their respective native languages and is described at length in Chapter 3, Section 3.3.2. I compared the percentage of error types of the L2 learners to the percentage of error types found in Cheng and Caldwell-Harris' subjects to determine if the L2 learners exhibited a unique pattern of errors or looked like monolingual English-speakers.

Second, I wanted to see if Chinese (L1) and Cyrillic (L1) readers of English demonstrated different error patterns from each other. I had four subjects who read

Chinese and four subjects who read Cyrillic. As noted above, Chinese readers are hypothesized to use something similar to a whole word approach when reading their native language and Cyrillic readers are hypothesized to be more likely to treat a text as decodable. To investigate how similar Chinese and Cyrillic readers' errors were when reading in their second language, I looked at the error data in three ways. First, I compared each group using Cheng and Caldwell-Harris' coding system.

Next, I coded all words in the data simply as words, nonwords or ambiguous. As Ellis and Hooper (2001) note, a lexical (or whole-word) reading strategy should result in more real word errors; whereas a sublexical (or "sounding out" strategy) should result in more nonword errors. If the Chinese readers were, indeed, transferring decoding skills from their L1 to reading in English (L2), I should see more real word errors. Likewise, I should see more nonword errors in my Cyrillic subjects. Looking at errors as words, nonwords or ambiguous did reveal a statistically significant difference between Chinese and Cyrillic readers.

Third, I wanted to demonstrate that the different error patterns in readers did not stem from differences in the texts students read. The subjects had selected texts to read based on their interests and had not, therefore, all read the same text. During pre- and post-assessment, however, students had read leveled passages from the QRI-5. I was able to compare one passage that three different readers (two Chinese L1 and one Cyrillic L1) had read aloud at the instructional level and a second passage that two different readers (one Chinese L1 and one Cyrillic L1) had read aloud.

The final analysis performed in this study explored whether error patterns seen in

readers from different L1 backgrounds changed over time with exposure to a second language. Change over time would indicate that experience reading a new writing system causes readers to pay attention to different kinds of information in the new orthography, as hypothesized by Wang, Koda, and Perfetti (2003). I calculated the percentage of real word errors each reader made over the course of the study (2-6 months, depending on the reader).

4.2 Methodology

4.2.1 Participants

Data for the first part of this analysis was gathered from reading sessions with nine ELL subjects who had enrolled in the RMA study (see Section 2.2.3 in Chapter 2). For the analyses that compare Chinese and Cyrillic readers I used only eight of the subjects' oral reading errors because the ninth subject read Japanese. Four students spoke Mandarin Chinese as a first language, two students spoke Bulgarian as a first language, one student spoke Mongolian as a first language and one student spoke Russian as a first language (see Table 2 in Section 2.2.3 of Chapter 2).

4.2.2 Instruments

4.2.2.1 Cheng and Caldwell-Harris' Coding System Cheng and Caldwell-Harris' coding system, divides errors into three major groups: pure substitution errors,

combined substitution errors and miscellaneous errors. Pure substitution errors demonstrate one kind of linguistic relationship to the target word: semantic, phonological or orthographic. Combined substitution errors demonstrate more than one linguistic relationship to the target word. Miscellaneous errors include insertions, inversions, omissions, morphologically related errors and function word substitutions. See Appendix F for the authors' original coding system and examples from Chinese. See Figure 4 in Chapter 3, Section 3.3.2 for English examples.

4.2.2.2 Word/Nonword Coding I coded each error students made as a real word or a nonword error. In cases when I could not be certain if the word was a real word, I coded the error as ambiguous. Ambiguous errors occurred primarily when I couldn't determine if an error was caused by nonnative pronunciation.

4.2.2.3 QRI-5 Passages Since the eight subjects read different texts from each other the majority of the time, I wanted to see if the types of errors they were making could be considered a result of the text. Students had read QRI-5 passages during pre- and post-testing, and in these cases they had often read the same text. Therefore, I was able to compare Cyrillic and Chinese readers' errors on the same texts.

4.3 Results

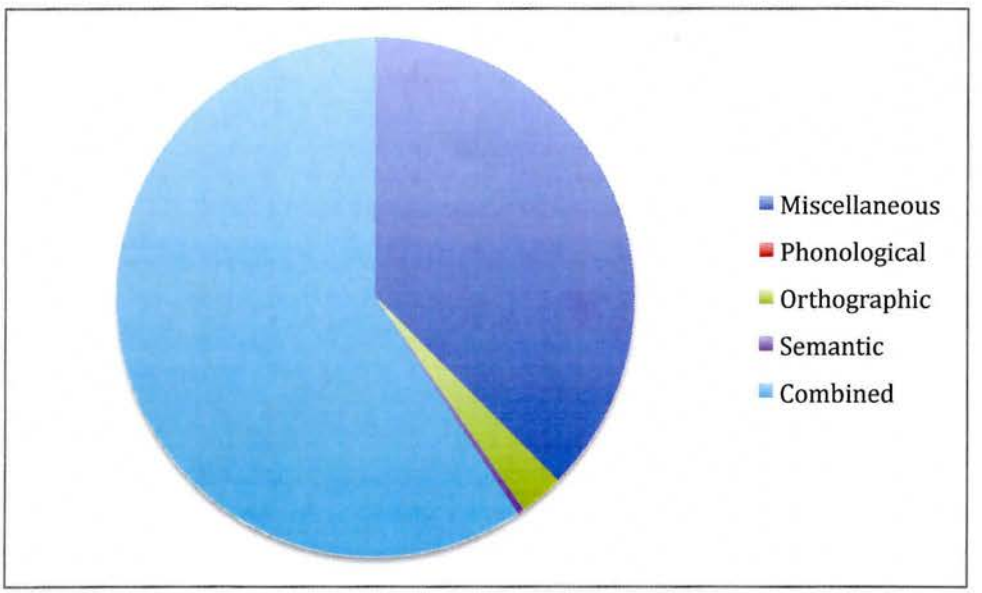
4.3.1 ELLs and Native English Speakers Reading English

Second language readers provide a unique opportunity to understand how much a given orthography, versus how much our first language reading experience, dictates how we decode. Some studies have shown that orthographic awareness does not transfer (or does not transfer substantially), suggesting that the reader needs to learn how language is encoded in each new writing system and develop skills for reading each new writing system. Other studies show that orthographic awareness may transfer, and readers exhibit patterns in reading L2 that reveal something about metalinguistic skills developed to read the L1 orthography. To explore this question, I first compared L2 readers' error patterns to L1 readers' error patterns, using the coding system developed by Cheng and Caldwell-Harris.

I calculated the percentage of error types L2 readers made and compared them with the native English readers in Cheng and Caldwell-Harris' study of semantic substitution errors. The mean age of the subjects in my study was 15.7 yrs. The mean age of subjects in Cheng and Caldwell-Harris' study was 19.2 yrs.

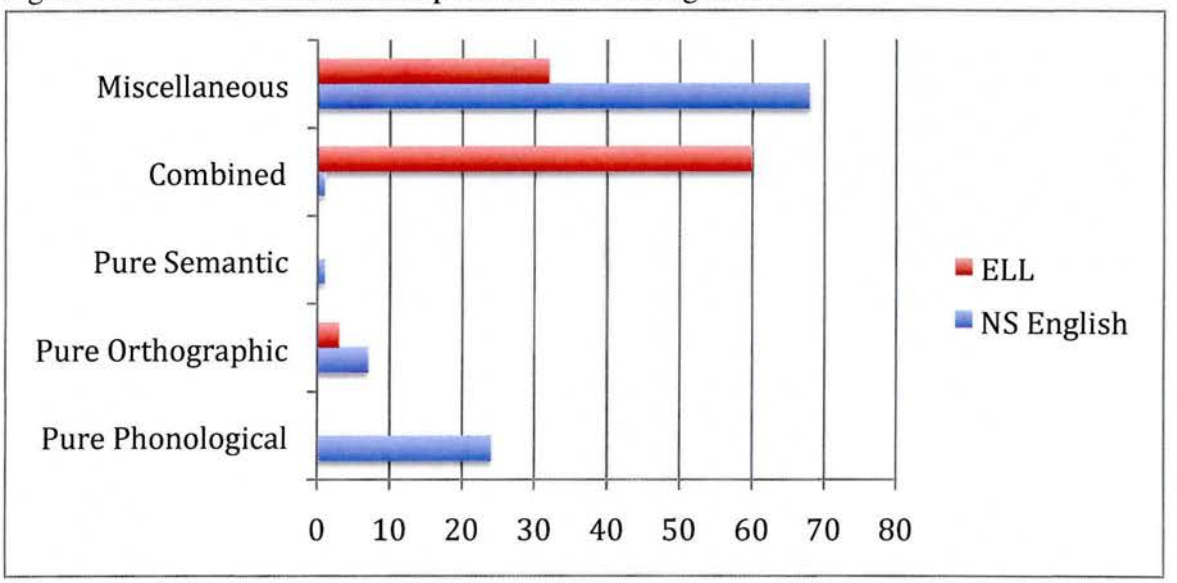
The largest percentage of errors for my L2 readers was combined errors, totaling 2,142, or 60.1% of errors. Miscellaneous errors were also a large percentage of the total errors, totaling 1,221, or 34.2% of errors. There were no pure phonological errors, and there were only 122 pure orthographic errors (3.4%) and 14 pure semantic errors (.4%) (see Figure 6).

Figure 6: ELL Students' Oral Reading Errors (n = 3,714)



In comparison, Cheng and Caldwell-Harris found that the largest percentage of errors for native English speakers was Miscellaneous Errors (67.5%). Approximately 24% were pure phonological errors, 7% were pure orthographic and 1.1% were pure semantic errors. Combined errors also made up only about 1% of errors (see Figure 7).

Figure 7: Native and Nonnative Speaker Oral Reading Errors



This suggests that L2 readers as a group differ from native speakers when they make oral reading errors. L2 readers make more combined substitution errors than pure errors. Yet L2 readers may also share some similarities with native English readers. Although miscellaneous errors don't make up as high a percentage of their errors as they did for native speakers, it is interesting that they made a much higher percentage of this type of error than the Chinese speakers in Cheng and Caldwell-Harris' study. Miscellaneous errors made up only 7% of Chinese readers' errors when they read Chinese text.

4.3.2 Cyrillic Readers and Chinese Readers Reading English

If Chinese and Cyrillic L2 readers of English exhibited different patterns of errors when reading in L2, it would suggest that they were using different strategies or

metalinguistic skills to decode English. If they made the same kinds of errors, it might suggest that they approached English texts in the same way. To explore this, I next disaggregated the Mongolian, Russian and Bulgarian speakers' L2 reading errors from the Chinese speakers' L2 reading errors, still using Cheng and Caldwell-Harris' codes.

Cyrillic readers showed small differences in percentage calculations from Chinese readers, but overall miscellaneous and combined substitution errors made up the largest percentages of each groups' errors and their error patterns remained similar enough that they are imperceptible on the pie chart graphic (see Figures 8 and 9). Cyrillic readers made a total of 1,173 errors. Of these, 339 (28.9%) were miscellaneous errors and 748 (63.8%) combined substitution errors. Pure orthographic errors totaled 40 (3.4%) and pure semantic errors totaled 4 (.2%). Chinese readers made a total of 2,389 errors. Of these, 882 (36.9%) were miscellaneous errors and 1,394 (58.4%) combined substitution errors. Pure orthographic errors totaled 64 (2.7%) and pure semantic errors totaled 10 (.4%).

Figure 8: Cyrillic Readers' Oral Reading Errors in English L2

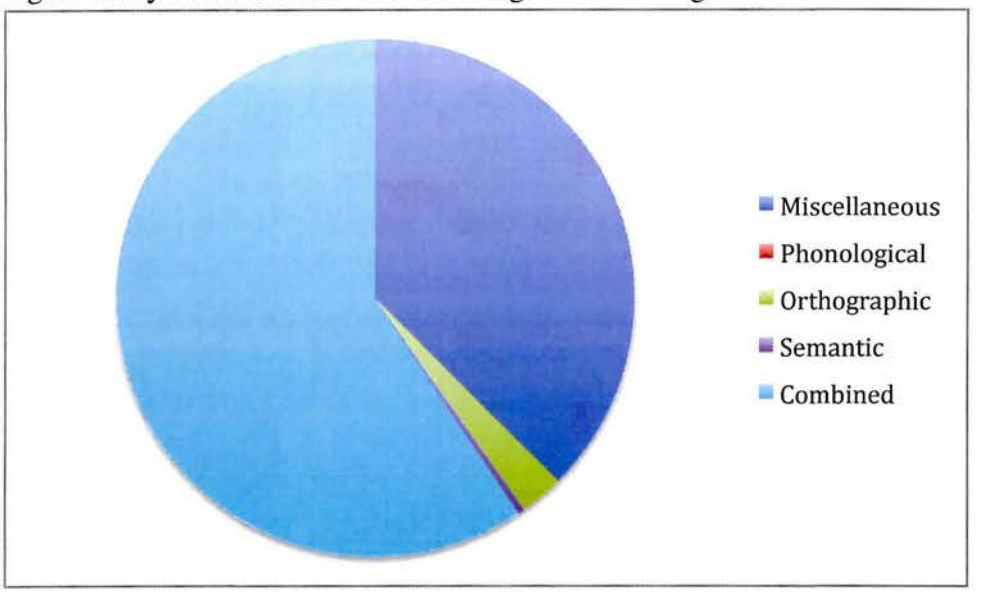
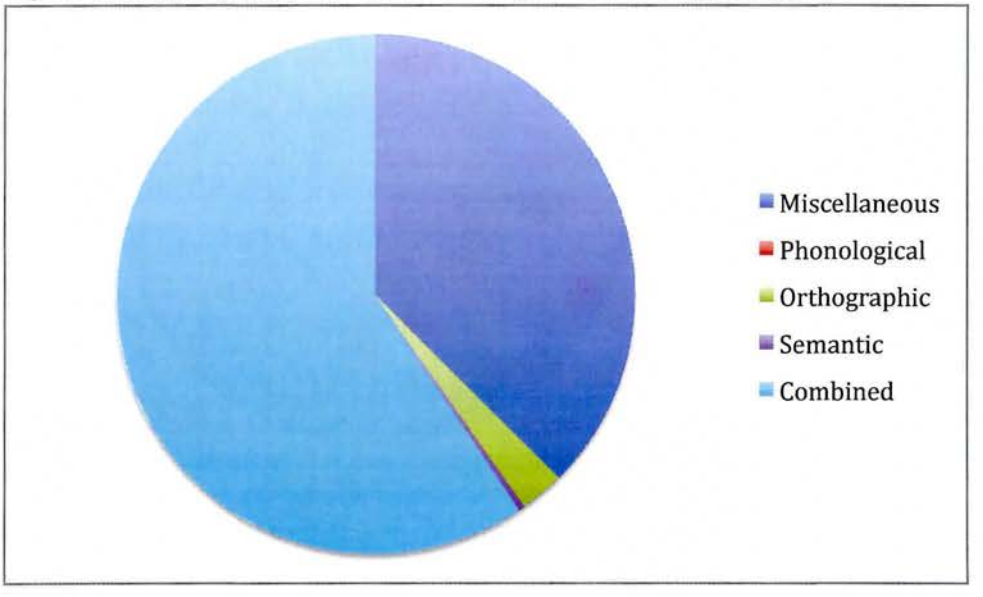


Figure 9: Chinese Readers' Oral Reading Errors in English L2



At first glance, these results suggest that Chinese and Cyrillic readers really aren't that different from one another when they read English. Similarity of these two groups would suggest that the orthography, and not the L1 writing system, dictates which skills and strategies readers use to decode text. An alternative explanation is that Cheng and

Caldwell-Harris' coding system was not designed to reveal the differences between the two groups of nonnative speakers.

As I noted in Section 3.3.2 of Chapter 3, Cheng and Caldwell-Harris' system was designed to code the oral reading errors of Chinese readers reading Chinese, and it was also used with native English speakers. However, there may be some attributes of English orthography that cannot be so readily classified in the system as is. In particular, I noted that the error type Combined Substitution – Phonological + Orthographic appeared in my data to be two distinct types of errors: (a) those that were nonwords and (b) those that were real word substitutions with no apparent semantic relationship to the target. I also noted in Section 3.4 of Chapter 3 that a significant percentage of native English speakers' errors were coded as Miscellaneous in this coding system. This may be the case because of grammatical differences between the languages.

Though both Chinese and English are often classified as analytic languages, English has more bound morphemes than Chinese. I wondered if the respective structures of the languages and orthographies led more errors in Chinese reading to be classified as semantic substitutions and more errors in English word reading to be classified as Miscellaneous – Morphological Substitution errors. English has more inflectional and derivational morphemes than Chinese, so more of these types of errors are possible. To illustrate with an example: in English, if "teach" were substituted for "teacher", this would be a morphological substitution because "teacher" is formed by adding a derivational suffix to the root word "teach". In Chinese, on the other hand, if 教

(jiao4 "teach") were substituted for 老师 (lao3 shi1 "teacher"), it would be a combined substitution error. The character has one part of a radical in common, some sound similarity and some semantic similarity. Chinese also lacks articles, and these made up a good number of omission errors in English reading, another error type that is coded as miscellaneous.

4.3.3 Word and Nonword Errors

Many of the combined substitution errors my subjects made were coded as Combined Substitution Error: Orthographic + Phonological, and I wanted to explore this category of error further to see if differences in my two groups existed within. I noticed that some of these errors were real words, though not semantically related to the target, and some of these errors were nonword, so I coded each oral reading error in my database with one of three codes: (a) word (b) nonword (c) ambiguous. An error was deemed ambiguous if I could not tell if it was a real word substitution or was a result of the student's L2 pronunciation or decoding error. I compiled results by individual reader first and noticed that the Chinese L1 readers and the Cyrillic L1 readers exhibited different patterns in the amount of word- and non-word-type errors they made in oral reading (see Table 36).

Table 36: Cyrillic and Chinese Readers' Word and Nonword Errors

Subject	Total Errors	Real Word Errors	Nonword Errors	Ambiguous
Cyrillic Readers				
Ana	390	166	186	38

Bat	316	88	183	45
Marco	414	236	137	41
Nikon	54	25	26	3
Total	**1,174**	**515**	**532**	**127**
Chinese Readers				
Chong	258	157	75	26
Lan	134	75	37	21
Xue	823	429	315	79
Bao-yu	1174	765	305	104
Total	**2,389**	**1,426**	**732**	**230**

Generally speaking, Cyrillic readers made more nonword errors than real word errors and Chinese readers made more real word errors than nonword errors. Marco was an exception to this pattern, as he was a Cyrillic reader but made more word than nonword errors.

To determine if this pattern was statistically significant I performed a Chi-square analysis with the compiled results of the Cyrillic reader group and the Chinese reader group (see Table 37).

Table 37: Chi-square Analysis of Cyrillic and Chinese Word and Non-word Errors

	Real Word Errors	Nonword Errors	Ambiguous Errors	Totals
Cyrillic Readers	515	532	127	1174
Chinese Readers	1426	732	230	2388
Totals	1942	1264	356	3562

This analysis showed a significant Chi-Square value of 85.06 ($df = 2$; $P < .0001$) with a Cramer's V of 0.1545.

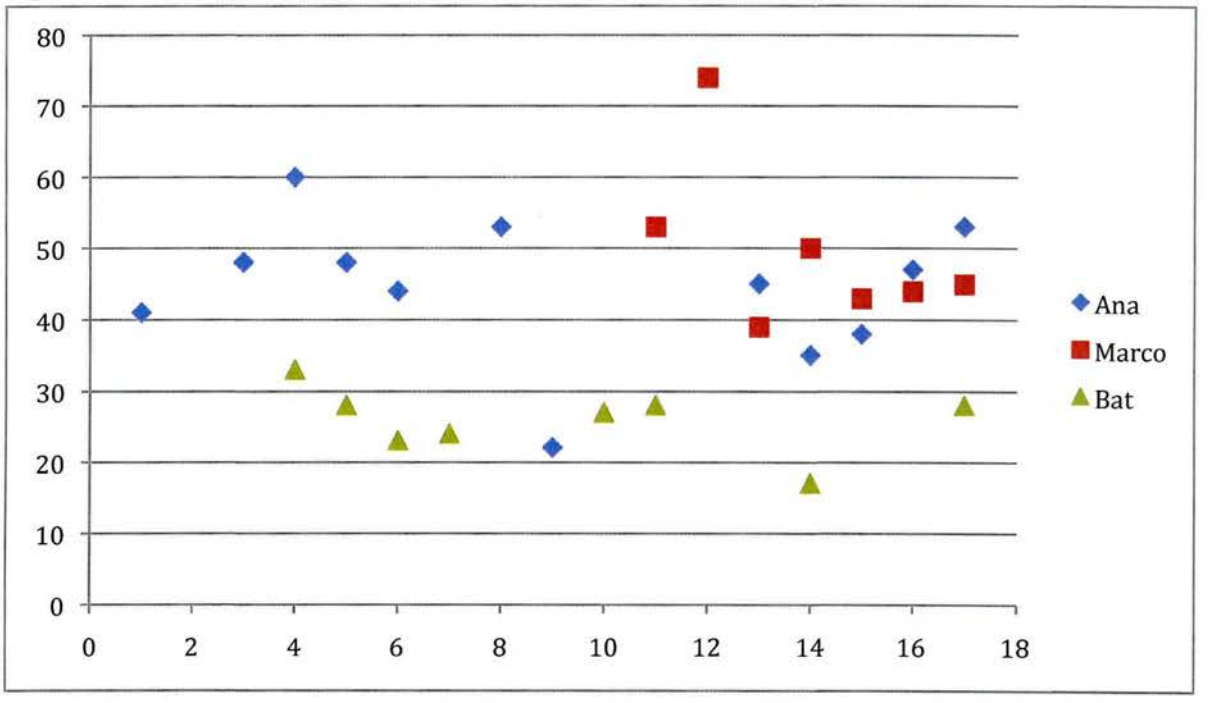
Although this study is limited by the small number of subjects it included, these results provide support for the hypothesis that Chinese readers are, in fact, more likely to use a lexical reading strategy when reading English (L2); whereas, Cyrillic readers are more likely to apply a sublexical, or "sounding out", strategy when reading English (L2). These results also suggest that decoding strategies from L1 may be transferred to reading in L2.

4.3.4 Do L2 Readers' Errors in English Reading Change Over Time?

Wang, Koda and Perfetti (2003) hypothesize that even if readers transfer skills they have developed in reading their L1 orthography to reading in their L2 orthography, experience with L2 reading will make them look more like native speakers in their decoding over time. I had read with my subjects for two to six months, depending on the length with which they participated in the study, so I was able to investigate change in individual readers' percentage of real word errors. I chose to look at percentage of real word errors because the Cyrillic and Chinese readers had differed on this measure, suggesting that the difference might be explicable by some transfer of L1 reading skill or strategy.

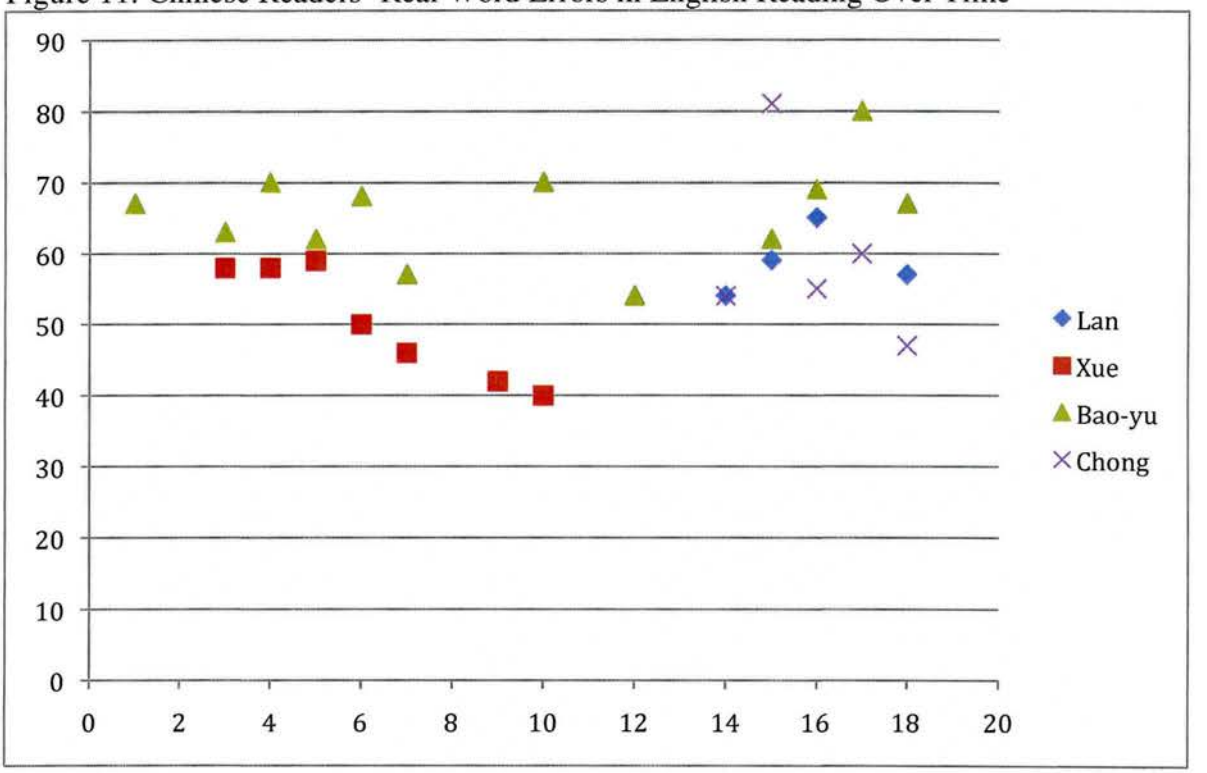
In Figure 10, I charted the percentage of Cyrillic readers' errors that were real words (y-axis) over the weeks I read with them (x-axis). I excluded any readings that produced fewer than 17 errors because percentages might have been skewed by the small number of errors. I also excluded Nikon's readings, since he only read two texts that produced more than 17 errors.

Figure 10: Cyrillic Readers' Real Word Errors in English Reading Over Time



As can be seen in the scatter plot, the percentage of oral reading errors that were real words fluctuated but did not change over time. I performed the same analysis for the Chinese readers and found that three of the Chinese readers (Lan, Chong and Bao-yu) also demonstrated a consistent percentage of real word errors over time (see Figure 11). Xue, on the other hand, appears to have made fewer real word errors over time.

Figure 11: Chinese Readers' Real Word Errors in English Reading Over Time



One student changed in the percentage of real word errors over time and there was no change for the other six readers. These data suggest that some L2 readers may not adjust their reading to a new orthography in a two- to six-month time frame. Most of the readers in the study had been enrolled in an English-speaking school for less than one year and may have still been too new to English reading for change to occur.

4.3.5 Cyrillic and Chinese Readers' Error Patterns in Qualitative Data

It is possible that differences in error patterns could have been a result of the different texts subjects read. To see if this was likely, I looked at samples of Chinese and Cyrillic L1 readers reading the same text in English.

I examined two QRI-5 passages that multiple subjects had read. The passages were selected because they had been read by both Cyrillic and Chinese readers and because the subjects had all scored instructional level on the text. For the purpose of this analysis, I color-coded the oral reading errors for each reader as words (blue), nonwords (red) or ambiguous (green). The first passage "Cats: Lions and Tigers in Your House" (Leslie & Caldwell, 2011) was read by Bao-yu (Chinese L1), Ana (Bulgarian L1) and Bat (Mongolian L1). Their readings can be seen in Figures 12, 13 and 14 respectively.

Figure 12: Bao-yu's Reading of "Cats: Lions and Tigers in Your House

House cats, lions, and tigers are part of the same family. When animals are part of the same family, they are alike in many ways. and[24] house cats are like lions and tigers in many ways, too. When kittens moms[25] are first born, they drink milk from their mothers. Lions and tigers moms drink milk from their mothers too. When kittens are born, they have [krowz] lion[26] too[27] claws, just like big cats. Claws are used by lions, tigers, and kittens to help them keep away enemies. As kittens get bigger, they learn to hurt[28] mom hunt from their mother. House cats hunt in the same way that lions

[24] [ænd]

[25] [mɑmz]

[26] [lajn]

[27] [tu] I transcribed this miscue as "too" for "to" based on two types of evidence. First the subject came to a full stop after the word. Second, the word was read with falling pitch as "too" (or "two") would be and had a longer duration than "to." After reading the word, Bao-yu paused, perhaps to re-read silently when she saw that the sentence continued on, and she continued reading without correcting her miscue.

[28] [hɛrt]

and tigers do. They hide and lie very still. When the animal they are

[kemz] closer[29]

hunting comes close, they jump on it and grab it by the back of the

neck. Cats kill other animals by shaking them and breaking their

necks.

Tigers[30]

Lions, tigers, and house cats show when they are afraid in the

way[31]

same ways, too. Their fur puffs up, making them look bigger. They

These[32]

hiss and spit, too. Those are their ways of saying, "I'm afraid, don't

come closer."

use[33]

A cat's tongue has many uses. Because it is rough with little

[bʌts] [lɪpɪŋ]

bumps on it, it can be used as a spoon. A cat drinks milk by lapping

---

[29] [klosɚ]

[30] [tajgɚz]

[31] [wez]

[32] [ðiz]

[33] [juz]

its[34]
it. Because of the bumps, the milk stays on the tongue until the cat

[raf]
can swallow it. If you feel the top of a cat's tongue, it is rough. This

makes the tongue good for brushing the cat's hair. Lions and tigers

tongue[35]
clean themselves with their tongues just like house cats do.

[34] [ɪts]

[35] [tʌŋ]

Figure 13: Ana's Reading of "Cats: Lions and Tigers in Your House

House cats, lions, and tigers are part of the same family. When animals are part of the same family, they are alike in many ways. house cats are like lions and tigers in many ways, too. When kittens are first born, they drink milk from their mothers. Lions and tigers drink milk from their mothers too. When kittens are born, they have [kajtrz] claws, just like big cats. Claws are used by lions, tigers, and kittens to [kloz] [kloz] [kajtɪnz] help them keep away enemies. As kittens get bigger, they learn to [kajtɪnz] hunt from their mother. House cats hunt in the same way that lions and tigers do. They hide and lie very still. When the animal they are hunting comes close, they jump on it and grab it by the back of the neck. Cats kill other animals by shaking them and breaking their

neck[36]
necks.

Lions, tigers, and house cats show when they are afraid in the same ways, too. Their fur puffs up, making them look bigger. They hiss and spit, too. Those are their ways of saying, "I'm afraid, don't come closer."

cat[37] it's[38] [rot]
A cat's tongue has many uses. Because it is rough with little Bumps on it, it can be used as a spoon. A cat drinks milk by lapping it. Because of the bumps, the milk stays on the tongue until the cat

the[39]
can swallow it. If you feel the top of a cat's tongue, it is rough. This makes the tongue good for brushing the cat's hair. Lions and tigers

---

[36] [nɛk]
[37] [kæt]
[38] [ɪts]
[39] [ðə]

tongue[40]

clean themselves with their tongues just like house cats do.

[40] [tʌŋ]

Figure 14: Bat's Reading of "Cats: Lions and Tigers in Your House

House cats, lions, and tigers are part of the same family. When animals are part of the same family, they are alike in many ways. house cats are like lions and tigers in many ways, too. When kittens are first born, they drink milk from their mothers. Lions and tigers drink milk from their mothers too. When kittens are born, they have [juzId] claws, just like big cats. Claws are used by lions, tigers, and kittens to help them keep away enemies. As kittens get bigger, they learn to to[41] hunt from their mother. House cats hunt in the same way that lions and tigers do. They hide and lie very still. When the animal they are hunting comes close, they jump on it and grab it by the back of the neck. Cats kill other animals by shaking them and breaking their

[41] [tu]

necks.

Lions, tigers, and house cats show when they are afraid in the same ways, too. Their fur puffs up, making them look bigger. They hiss and spit, too. Those are their ways of saying, "I'm afraid, don't come closer."

A cat's tongue has many uses. Because it is rough with little Bumps on it, it can be used as a spoon. A cat drinks milk by lapping it. Because of the bumps, the milk stays on the tongue until the cat can swallow it. If you feel the top of a cat's tongue, it is rough. This makes the tongue good for brushing the cat's hair. Lions and tigers

and
clean themselves with their tongues ˇ just like house cats do.

Looking at the same text, we can also see that Bao-yu, the Chinese reader, made a higher percentage of real word errors than Ana or Bat, the Cyrillic readers. Fourteen of Bao-yu's 20 errors (70%) were real words. Five of Ana's 13 errors (38%) were real word errors, and 1 of Bat's 4 errors (25%) was a real word error. This pattern was also evident in Ana's and Chong's (Chinese L1) readings of "Johnny Appleseed" (Leslie & Caldwell, 2011). Seven of Ana's 17 errors (41%) were real word errors and 14 of Chong's 26 errors (54%) were real word errors.

4.4 Discussion

As noted in the literature review, there appear be different routes to word reading in English: threshold-style, in which phonology and meaning are simultaneously activated, and a cascaded, "sounding out" process, in which phonology is activated first and meaning is activated afterward. It is hypothesized that these two approaches to reading would result in different kinds of errors—if one were reading in a threshold style, he/she might be likely to make whole-word substitutions; if one were using a "sounding out" strategy, he/she might be likely to make nonword errors. Although often taught to sound out words when learning to read, as native speaking English readers become more

automatic in their reading, they are more likely to attend to larger units of sound, such as rimes and syllablelike units, and meaning, such as morphemes and words, when they read. Which of these strategies do L2 readers' errors suggest they use?

When I coded Cyrillic (L1) and Chinese (L1) readers' oral reading errors in English (L2) using Cheng and Caldwell-Harris' (to appear) system, the two groups looked more alike than different. Both groups showed significantly more combined substitution errors than the native speakers in Cheng and Caldwell-Harris' study. Like the native speakers, on the other hand, the majority of L2 readers in the present study made a large number of miscellaneous errors and few pure semantic substitutions.

Yet, when I examined L2 readers' oral reading errors more closely, using a basic categorization of real word, nonword and ambiguous, there were actually significant differences in Cyrillic and Chinese readers' errors. Cyrillic readers made more nonword errors than Chinese readers. Chinese readers made more real word errors than Cyrillic readers. Examination of Chinese and Cyrillic readers' performance on the same text corroborated this finding. This suggests that Chinese readers may be more likely to utilize large units of sound and/or meaning in their decoding than Cyrillic readers, who may be more likely to use a letter-by-letter decoding strategy. In terms of the Dual Route Cascaded model (Coltheart et al., 2001) it appears that Chinese (L1) readers are more likely to apply a lexical strategy and Cyrillic (L1) readers are more likely to use a sublexical strategy in reading English (L2). In terms of the Transfer Facilitation Model, it appears that Chinese and Cyrillic readers may transfer metalinguistic skills from their first language to decoding in their L2 (English).

Although the pattern I found in Chinese and Cyrillic subgroups was also seen in most individual readers, Marco, one of the two more proficient Cyrillic (L1) readers, made errors that resembled the Chinese readers'. There are a number of possible reasons for this. For example, Marco's more frequent use of a lexical, whole word reading strategy may be related to changes in metalinguistic transfer as a result of L2 exposure (Koda, 2008). Another explanation could be that also when reading in Bulgarian, he was more likely than other Cyrillic readers to use a lexical strategy to decode. Future research should compare L2 error patterns found in this study to native English speakers, as well as to the L2 readers' error patterns their native languages to explore this.

The fact that real word versus nonword error patterns only appeared when real words that were not semantically related to the target were taken into consideration is also interesting. Cheng (2012) makes an important argument that semantic activation in reading needs to be distinguished from meaning. In Chinese writing this is more obvious because characters have semantic radicals (semantic information in the orthography) and meaning (stored in the mental lexicon). Here too, there appeared to be semantic activation in Chinese (L1) readers when they read English, though it didn't always result in retrieval of the right meaning. This would correspond with Cheng's (2012) finding that Chinese readers may demonstrate semantic and orthographic transfer when they read in English, despite the distance between the two orthographies.

For teachers this work has a number of important implications. First, L2 learners' error patterns in reading may differ from native English speakers' error patterns. Furthermore, L2 learners may differ from each other in the types of errors they make.

These differences may evidence learners' attempts to transfer (consciously or subconsciously) skills they have from reading their L1 orthography to reading in L2. Teachers should be aware of how their students' orthographies encode information about spoken language so they can encourage students to transfer skills that will help them decode and comprehend text in L2. On the other hand, teachers should not be overly concerned about ELL learners' oral reading errors unless they see that a student is struggling with comprehension and differs significantly from like peers in the progress he or she is making.

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CHAPTER FIVE: GENERAL DISCUSSION AND CONCLUSIONS

The English language learner (ELL) population is growing quickly. This diverse group of learners has great potential to learn, but generally lags behind native speakers on several academic measures, including reading. Furthermore, although interest in second language reading has grown, most reading research has been conducted with monolingual native speakers of English. This dissertation addresses the need for reading research with adolescent ELLs by exploring three distinct questions:

1. What effect does Retrospective Miscue Analysis have on adolescent ELLs' reading? (Study 1; Chapter 2)
2. What are the strengths and limitations of Reading Miscue Inventory and Cheng and Caldwell-Harris' coding system for coding ELLs' miscues? (Study 2; Chapter 3)
3. What do patterns in L2 reading errors suggest about transfer of L1 decoding skills? (Study 3; Chapter 4)

First, nine adolescent ELLs were recruited and a reading procedure called Retrospective Miscue Analysis (RMA) was carried out with six of them to determine what effects the approach had on their reading performance. Second, the reading data from all of the students was used to evaluate two coding systems to determine what each could and could not illuminate about ELL readers' errors. Finally, patterns in ELL students' reading errors in different languages were compared to native speakers and to

each other. Eight of the recruited subjects had experience reading Chinese or the Cyrillic alphabet, and analysis of these subgroups' oral reading errors allowed me to draw inferences about the way that these learners' first orthography influenced their decoding in English.

5.1 The Retrospective Miscue Analysis (RMA) Study

The first study I conducted on Retrospective Miscue Analysis (RMA) suggested that the approach was not particularly helpful for my subjects. Post-scores of the subjects' decoding accuracy, fluency, and comprehension on the Qualitative Reading Inventory-5 (QRI-5) showed little or no change when compared to baseline scores on the measure. Fluency was an area in which some subjects appeared to improve while others appeared to get worse. One student showed improved fluency over the course of the RMA sessions as well as in a comparison of pre- and post- QRI measures of fluency and noted this area of improvement in a follow-up interview. But another student, Eiko, showed consistently worse scores for fluency over the course of the RMA session and the same fluency scores on pre- and post QRI readings. Eiko's comprehension and decoding accuracy scores also stayed the same, indicating that the decreased fluency was a byproduct of improvement in other areas.

Although four students showed improvement in decoding accuracy (as measured by number of miscues per 100 words read) on the QRI-5 post-test scores, only two students showed improved decoding on the RMA readings over time, and neither of those students improved dramatically in reading level on the QRI-5 post-measure. Since all

students showed small improvements in language proficiency and only slight (or no) improvement was evident on reading measures, one possibility is that the improvements seen on reading measures were related to gains in English proficiency rather than RMA.

Previous studies of RMA had used the Reading Miscue Inventory (RMI) to look at change in number and type of miscues over time and interview data to look at attitude changes but had not used additional measures such as the QRI-5 and PPVT-4 to look at changes in decoding accuracy, fluency, comprehension and vocabulary. These previous studies (Goodman & Marek, 1996; Marek, 1987; Wurr, Theurer, & Kim, 2008) found that RMA helped readers revalue[42] themselves and understand the reading process. To explore whether my subjects experienced these attitudinal changes seen in other studies, I also employed the RMI and interviews. There was little or no change in the type of miscues my subjects made over the course of RMA sessions as measured with the RMI, but interview data did reveal that students found the procedure helpful. Students also reported liking the collaborative nature of RMA, and most subjects reported positive feelings about the RMA sessions and motivation to continue reading in their concluding interviews. These responses may indicate that RMA has the potential to motivate ELL readers and might be useful to build adolescent ELLs' confidence in their reading skills, especially in their ability to read aloud.

This study of RMA has a number of implications for practitioners. First, teachers should monitor students' responses for confidence and self-assuredness as they use RMA and take care to promote and preserve such feelings. While some students may benefit

[42] This term is used in Goodman & Marek (1996)

from the one-on-one support and individualization of this kind of procedure, others may believe their errors stem from being nonnative speakers and feel defeated by discussion of reading errors in the RMA format.

From a linguistic standpoint, adjustments and special instructions for using this approach with nonnative speakers should be included in the procedures to ensure that RMA discussion focuses on errors that (a) ELLs really need to and *could* fix or (b) high quality miscues ELLs don't need to fix and demonstrate that not all miscues disrupt meaning. Developmental errors such as omission of grammatical morphemes (e.g., past tense *–ed*, plural *–s*, etc.) should not be a focus of RMA discussions. ELLs often omit these morphemes as part of their L2 grammar, or *interlanguage*, and they may be more so and indication of their language proficiency than of their reading abilities (Bailey, Madden, & Krashen, 1974; Dulay & Burt, 1973, 1974; Jiang, 2004, 2007; Larson Freeman, 1975; Long, 2003)

Finally, the RMA prescribes that readers be instructed to read as if they were alone (i.e., without assistance from the researcher or teacher). I would suggest that when RMA is conducted with ELL students, vocabulary instruction be embedded in the experience. Vocabulary knowledge is a known area of weakness for ELLs in reading, and providing contextualized discussion of unknown words when they are not derivable from context will facilitate ELL students' opportunities to make meaning from texts. Although care will need to be taken to ensure that embedded instruction of vocabulary does not diminish RMA's goals of fostering reader autonomy and empowerment, without embedded vocabulary instruction RMA lacks one of the main tenets of best practice for

ELL instruction, and it is difficult to justify its use.

The strength of the conclusions in this study is certainly limited by the small number of subjects and perhaps by the timeframe. Although the number of subjects in this study was consistent with other studies of RMA and this study included an n-of-one design to provide baseline and post-test comparisons, more subjects and an experimental design would be needed to draw statistically significant conclusions about the effects of RMA. Furthermore, the finding that RMA did not change decoding accuracy, fluency or comprehension for most subjects may be due to the short timeframe during which the procedure was used. Although I used a timeframe similar to that of other studies of RMA, it may be that RMA needs to be implemented over a longer period of time with ELLs to have an effect on decoding accuracy, fluency, vocabulary or comprehension. Another possibility is that positive effects of RMA are not immediate but come in the form of increased future reading and/or awareness.

Future research on RMA should explore its use for different periods of time. Research should examine the effects of short-term use of RMA on ELL readers who appear reluctant to practice oral reading in whole or small group learning contexts. Research could also explore whether RMA affects reading when used over a longer period of time. Finally, since RMA appeared to increase motivation and engagement in reading, future research should explore whether there are delayed effects of RMA by measuring readers' growth six months to a year after RMA sessions have been conducted to see if readers sustained the confidence and motivation noted in concluding interviews.

5.2 The Methodological Study:

Coding English Language Learners' (ELL) Oral Reading Errors

As part of the methodology for Retrospective Miscue Analysis (RMA), ELL students' reading errors were coded with a system called the Reading Miscue Inventory (RMI) (Goodman, Watson, & Burke, 2005). When unique challenges surfaced in coding ELL errors, I sought and found an alternative coding system designed by Cheng and Caldwell-Harris (to appear) and examined students' own reflections about their errors. In using and comparing the two coding systems as tools for learning about ELLs' errors and incorporating ELL students' own reflections on their errors, I was able to draw conclusions about the unique challenges presented by this populations' miscues. Furthermore, I was able to note the strengths and weaknesses of the RMI, Cheng and Caldwell-Harris' coding system, and student interview data as tools for learning about the sources of oral reading errors.

The Reading Miscue Inventory (RMI) has traditionally been used in Retrospective Miscue Analysis (RMA) studies. It analyzes miscues in terms of: Meaning Construction, Grammatical Relations, Graphic Similarity and Sound Similarity. In my study, Meaning Construction scores appeared greatly inaccurate for second language learner miscues for three reasons. First, ELL miscues less frequently indicate that the reader does not know what a word means than native speaker errors do because ELLs may mispronounce words due to L2 phonology. The converse is also true: ELLs may decode many words correctly because they have strong decoding skills, but may not know what the words mean. Third, ELLs make many more omissions of grammatical morphemes than native

speakers, and the RMI codes syntactically unacceptable miscues as semantically unacceptable. This resulted in additional ELL miscues being inaccurately coded as demonstrating a loss of meaning. Given these findings, the Meaning Construction category of the RMI requires revision or should not be used with ELL miscues.

In terms of Grammatical Relations, Sound Similarity and Graphic Similarity, RMI provides a less-flawed but fairly general analysis of ELL students' miscues. As noted above, in some cases, it is difficult to determine if an ELL's reading is a miscue or a product of L2 pronunciation. If RMI is to be used with ELL readers, the procedures need to be adapted to provide guidance for evaluating whether miscues stem from L2 phonology. Comparative samples of oral language could help teachers distinguish foreign accent from a reading error, especially if L2 subjects had a high proficiency in English (L2) and a relatively stable L2 phonology. A thorough understanding of the L2 learner's L1 phonology would also be useful, but it is unreasonable to expect teachers to know the phonology of each ELL's native language. Using the International Phonetic Alphabet to transcribe miscues would facilitate more precise analysis and comparison of miscue and target word sounds and may be more time effective for teachers to learn.

Even with such knowledge and skill, in some cases it is difficult or impossible for a researcher or teacher to guess if miscue stems from L2 pronunciation or inaccurate decoding. For this reason, Sound and Graphic Similarity scores may be skewed. For ELLs, scores in these categories are highly likely to reflect both decoding accuracy *and* pronunciation accuracy.

The second system for coding oral reading errors, which was designed by Cheng

and Caldwell-Harris, proved a useful instrument for identifying general patterns in the oral reading errors of ELLs in my study. Because it does not make conclusions about how errors affect a reader's ability to construct meaning, as the RMI does, it avoided erroneous conclusions. It also allowed for errors that appeared to have two or more relationships to the target to be coded as "Combined," and it eschewed problematic gradations of graphic and sound similarity. However, it is only able to compare errors to a single target word and does not provide insight into the role of context in oral reading errors.

Because Cheng and Caldwell-Harris' goal in developing this system was to examine semantic substitution errors in Chinese readers, the system may need some adjustments for use with English readers (both L1 and L2). When the researchers used these codes with native English readers, for example, 67.5% of errors fell into the Miscellaneous category, and ELLs also had many Miscellaneous errors, according to this system. The system could be developed to investigate error types in the Miscellaneous category more closely. In particular, the sub-categories of Miscellaneous errors that examine morphological and omission errors could be restructured to highlight errors involving grammatical morphemes. Also, as I discussed in Chapter 4, substitution errors could be further coded to indicate whether the reader produced a word or a nonword.

RMA interview data provided insight into reader errors, though interviews, like coding systems, cannot tell the whole story. Since RMA interviews are conducted some time after the reading takes place (usually a week), readers may forget what they were thinking at the time. It may be possible to modify this part of the procedure and

interview the reader when the reading is still fresh in his/her mind. Nonetheless, we must also remember that readers may not always be consciously aware or have declarative knowledge of all of the information they are processing as they read, regardless of when they are interviewed. For example, L2 readers often told me they could not read a word because they did not know it, but in fact were able to tell me something about its grammar or make an attempt at its pronunciation. This indicates that they continued to use linguistic information from the text at these times, despite the fact that they were not indicating as such in the interview. In other cases, low proficiency L2 learners may not have been able to adequately explain their thinking about miscues to me in their L2 English.

It is also noteworthy that ELL students' interviews provided information about contextual and sociocultural factors that affected their oral reading and cannot be captured in coding systems that focus solely on linguistic aspects of reading. Interview data suggested that oral reading errors may stem from L3 transfer, prior L2 instruction, or fatigue. Certainly even in cases when these factors are at play, readers process linguistic information and use it to read text aloud; yet, students' reflections on these influences indicate how complex and fluid reading is. This may indicate how enormously difficult it is to develop a coding system that accurately captures the reading process.

For teachers this study has a number of implications. Oral reading errors, or miscues, continue to be evaluated on reading assessments (e.g., QRI-5) and can provide valuable information about a student's reading abilities if used well. To ensure this procedure is informative and accurate, teachers should consider the following points as

they evaluate their ELLs' miscues:

1. Teachers should avoid hasty assumptions about whether ELLs' miscues affect their understanding of text. Retelling activities and comprehension questions should be used to gauge comprehension rather than miscues.
2. Teachers should transcribe ELLs' miscues in IPA and compare the observed response to the expected response. Especially when the miscue differs in only one sound, the teacher should question whether L2 phonology could have caused the miscue.
3. If a teacher has many ELLs with the same linguistic background, the teacher could read a text like *Learner English: A Teacher's Guide to Interference and Other Problems* (Swan & Smith, 2001) to learn about the phonology of the students' native language.
4. If a teacher has ELLs with diverse L1 backgrounds, the teacher could transcribe a short speech sample and compare the sounds of her students' nonnative English to the sound patterns observed in oral reading.
5. Teachers should code ELLs' oral reading errors involving omission of grammatical morphemes separately.
6. For the purpose of establishing whether a text is independent, instructional or frustration level, grammatical morphemes should (a) be evaluated as dialectal (rather than as miscues) or (b) be counted the first time but noted as a repeated miscue (and not counted) subsequently, even if the base word is different.

7. The ELL reader does not appear to be as powerful "an intuitive grammarian" (Goodman & Goodman, 2004, p. 628) as a native speaker. Evaluation of Semantic Acceptability should not be dependent on scores for Syntactic Acceptability when using the RMI with ELLs.
8. Teachers should consider context as a source of miscues. Although ELLs may demonstrate ungrammatical miscues, they are using the same cuing systems as native speakers to make meaning from text. This includes graphophonic information and semantic and syntactic information from surrounding text.
9. Teachers should base conclusions about ELL students' reading on multiple assessments and not rule out ELL students' affect and prior experiences as potential sources of miscues.

5.3 The Study of Error Patterns: L1 Influence on L2 Decoding?

Although theories of word reading continue to debate how experienced English readers decode, a number of theories suggest there are at least two routes to word reading in English: threshold-style, in which phonology and meaning are simultaneously activated, and a cascaded, "sounding out" process, in which phonology is activated first and meaning is activated afterward (Coltheart, et al., 2001; Perfetti, Zhang, & Berent, 1992). It is further hypothesized that these two approaches to reading result in different kinds of errors: whole-word style reading results in whole-word substitutions and the "sounding out" strategy results more frequently in nonword errors (Perfetti & Dunlap, 2008). This study examined the errors of second language (L2) readers to learn (a) the

extent to which their errors looked like native readers of English (b) whether L1 orthography appeared to influence their L2 decoding errors in English and (c) if the types of errors they made changed over time.

When I coded Cyrillic (L1) and Chinese (L1) readers' oral reading errors in English (L2) using Cheng and Caldwell-Harris' (to appear) system, the two groups looked more alike than different. Both groups of ELLs showed more combined substitution errors than the native English speakers in Cheng and Caldwell-Harris' study. Like the native speakers, on the other hand, the majority of L2 readers in the present study made a larger number of miscellaneous errors and fewer pure semantic substitutions than the Chinese readers Cheng and Caldwell-Harris studied. This suggests that the orthography read may impact the types of oral reading errors one makes.

I next examined L2 readers' oral reading errors using a basic categorization of *real-word*, *nonword* and *ambiguous* and found statistically significant differences in Cyrillic and Chinese readers' errors. Cyrillic readers made more nonword errors than Chinese readers. Chinese readers made more real word errors than Cyrillic readers. Examination of Chinese and Cyrillic readers' performance on the same text confirmed this finding. This suggests that Chinese readers may attend more to larger phonological units or semantic units when reading English than Cyrillic readers, who may be a letter-by-letter decoding strategy.

The Transfer Facilitation Model (Koda, 2008a) hypothesizes that reading skills transfer across languages. Chinese is a logography and less transparent in terms of sound-grapheme relationships than Cyrillic, a relatively shallow, alphabetic orthography.

Studies have shown that readers of shallow orthographies are more likely to approach strings of letters as decodable information (Perfetti & Dunlap, 2008). The higher percentage of real word errors in Chinese readers than in Cyrillic readers suggests that L2 readers may indeed transfer reading skills from L1. This is especially interesting, because there has been some question about the extent that orthographic skills can be transferred when orthographies (e.g., Chinese and English) are dissimilar (Koda, 2008b; Kuo & Anderson, 2008; Wang, Park, & Lee, 2006). The results of this study correspond with Cheng's (2012) finding that Chinese readers may, in fact, demonstrate semantic and orthographic transfer when they read in English, despite the distance between the two orthographies.

Although the L2 decoding patterns I found for Cyrillic and Chinese subgroups appeared in most individual readers' errors, this was not always the case. Marco was a Cyrillic reader but, like the Chinese readers, made more real-word errors than nonword errors. There are a number of possible reasons for this. Marco was one of the two more proficient Cyrillic (L1) readers, so his error patterns may be indicative of changes that had occurred in his reading strategies due to L2 exposure (Koda, 2008a). This study also did not collect data on oral reading errors in L1; therefore, Marco's error pattern could be the result of transfer of an atypical reading strategy for Cyrillic. Future research should gather data on subjects' error patterns in L1 and compare them to the types of errors they make in L2 to determine transfer.

To address other limitations of this study, future research should recruit a greater number of subjects and compare L2 patterns to native speaker patterns of real-word and

non-word errors.

For ESL and reading teachers this work has a number of important implications. First, L2 learners' error patterns may differ from native English speakers' error patterns and from one another in the types of errors they make. These differences may evidence learners' attempts to transfer skills they have from reading their L1 orthography to reading in L2. Teachers should be aware of how different orthographies encode information about spoken language so they can encourage students to transfer skills that will help them decode and comprehend text in their L2. On the other hand, teachers should not be overly concerned about ELL learners' oral reading errors unless they see that a student is struggling with comprehension and differs significantly from like peers in the progress he or she is making.

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Appendix A: Questionnaire for Study Participants

Directions: Please answer the following questions. You can answer in English or Chinese.

1. What language(s) and/or dialect(s) do you speak?

2. If you went to school in China, did your school use Pinyin to teach you how to read?

3. If you went to school in China, did your school use Zhu-Yin-Fu-Hao to teach you how to read?

4. Did you ever stop going to school for longer than three months?

5. How old were you when you started learning English?

6. How old were you when you started to go to a school where all classes were taught in English?

7. How old were you when you moved to the United States?

8. What language(s) do you speak at home?

9. Are you motivated to learn English?
   Never Rarely Sometimes Usually Always

10. Do you work hard in school?
    Never Rarely Sometimes Usually Always

11. Which kinds of material do you read at home? (check all that apply)
    a. Letters
    b. Magazines
    c. Manuals

d. Nonfiction Books
e. Fiction Books
f. Newspapers
g. Comic Books
h. Other _____

12. What is a favorite book you read at home?

Appendix B: Burke Interview Modified for Older Readers (BIMOR)

1. When you are reading 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 you know?

3. What makes _____ a good reader?

4. Do you think _____ ever comes to something that gives him/her trouble when he/she is reading?

5. When _____ does come to something that give shim/her trouble, what do you think he/she does about it?

6. How would you help someone who was having difficulty reading?

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

8. How did you l earn to read?

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

10. Describe yourself as a reader: What kind of reader are you?

11. What do you read routinely, like every day or every week?

12. What do you like most of all to read?

13. Can you remember any special book or the most memorable thing you have ever read?

14. What is the most difficult thing you have to read?

Appendix C

RMA Response Form

SESSION _____

Session focus, if any _____

READER _____

RMA QUESTIONS:	READER FOCUSES ON: *Reproducing Text	**Constructing Meaning
1. Does miscue make sense?		
(each miscue is listed)	(reader comments are quoted)	
_____	_____	
_____	_____	
2. Did/should correct miscue? (as above)		
3. Why did reader miscue? (as above)		
4. Miscue affect understanding? (as above)		

NOTES _____

_____

_____

This form is a prototype. Various versions are referred to in this book.

Appendix D: Concluding Interview Questions

Appendix E

Closing Interview

1. How do you feel about yourself as a reader?

2. Do you have any different attitudes toward reading than you had at the beginning?

3. Have there been any changes in your reading as a result of our sessions? Describe.

4. How do you feel about your ability to continue improving your reading?

5. Generally speaking, what do you think about the sessions we spent together?

Note: Questions from the Burke Interview Modified for Older Readers will be asked again during the Closing Interview, where appropriate.

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Appendix E: Marco's Miscue Analysis In-Depth Procedure Coding Form

Reader VN
Date 5/31/2012
Selection All Quiet - Ch. 2 - Part 2

MC #	Reader Text		1 Syntactic Acceptability	2 Semantic Acceptability	3 Meaning Change	4 Correction	Meaning Construction: No Loss	Meaning Construction: P Loss	Meaning Construction: Loss	Grammatical Relations: S	Grammatical Relations: PS	Grammatical Relations: OC	Grammatical Relations: W	Graphic Similarity: H	Graphic Similarity: S	Graphic Similarity: N	Sound Similarity: H	Sound Similarity: S	Sound Similarity: N
1	three	threes	Y	P	--	Y	√			√				√			√		
2	platoons	platoons	Y	N	--	N			√		√			√			√		
3	$amongt	amongst	Y	N	--	N			√		√			√			√		
4	$labowrers	labourers	Y	N	--	N			√		√			√			√		
5	$disciplarian	disciplinarian	Y	N	--	Y			√	√				√			√		
6	a	in	P	N	--	Y	√			√						√			√
7	defiants	defiants	Y	N	--	Y			√	√				√			√		
8	barracks-	barrack-	Y	N	--	N			√		√			√			√		
9	square	square	Y	N	--	Y	√			√				√			√		
10	dust-plan $leytenant	dust-pan lieutenant	Y	N	--	N			√		√			√			√		
11	$consecitively	consecutively	Y	N	--	N			√		√			√			√		
12	newly-plod	newly-	Y	N	--	P			√		√			√			√		
13	Lay	ploughed Lie	P	P	--	P		√					√		√			√	
14	--	to	P	N	--	N			√				√	----------			----------		
15	$chaffed	chafed	Y	N	--	N			√		√			√			√		
16	watch-ID	watched	Y	Y	N	N	√			√				√			√		
17	$slightnest	slightest	Y	N	--	N			√		√			√			√		
18	$fayngers	fingers	Y	N	--	Y	√			√				√			√		
19	a	the	Y	Y	N	Y	√					√				√		√	
20	barracks	barracks	Y	N	--	N			√		√			√			√		
21	countryyard	courtyard	Y	P	--	N			√		√			√			√		
22	a	the	Y	Y	N	N	√			√						√		√	
23	/trud/	trod	Y	N	--	Y	√			√				√			√		
24	beyond-	bayonet-	Y	N	--	N			√		√			√			√		
25	practice	practice	Y	N	--	Y	√			√				√			√		
26	$whisoo	whilst	N	N	--	N			√				√	√			√		
27	easy	easily	Y	P	--	N			√		√			√			√		
28	stuck bear	struck were	N	N	--	Y	√			√				√				√	
29	$unfuried	infuriated	Y	N	--	N			√		√			√			√		
30	mightly	mighty	Y	N	--	Y	√			√				√			√		
31	to	--	P	N	--	N			√				√	----------			----------		
32	excelled	excelled	Y	N	--	N			√		√			√			√		
33	had	have	Y	P	--	P		√			√			√			√		
34	barrack-yard	barrack-yard	Y	N	--	N			√		√			√			√		
35	plant	planted	P	P	--	Y	√			√				√			√		
36	he	we	Y	P	--	N			√		√				√			√	
37	ourself	ourselves	N	N	--	N			√				√	√			√		
38	mean	means	P	P	--	N		√					√	√			√		
39	we will	we'll	Y	Y	N	N	√			√				----------			----------		
40	$ploged	ploughed	Y	N	--	N			√		√			√			√		
41	dispirited	desperate	Y	P	--	N			√		√			√			√		
42	$recrites	recruits	Y	N	--	N			√		√			√			√		
43	$conslvable	conceivable	Y	N	--	N			√		√			√			√		
44	$refinlment	refinement	Y	N	--	N			√		√			√			√		
45	$tou	tough	Y	N	--	N			√		√			√				√	
46	$grevius	grevious	Y	N	--	N			√		√			√			√		
47	esprit de	esprit de	Y	N	--	N			√		√			√			√		
48	corps /flnEst/	corps finest	Y	N	--	N			√		√			√			√		
49	passed	passes	Y	P	--	N		√			√			√			√		
50	look	looking	P	P	--	N		√					√	√			√		
51	I	It	P	N	--	Y	√			√					√				√
52	--	to	Y	Y	N	Y	√					√		----------			----------		
53	bulge	bulges	P	P	--	Y	√			√				√			√		
54	he	we	P	N	--	Y	√			√					√			√	
55	make	makes	P	P	--	N		√					√	√			√		
56	$eesays	essays	Y	N	--	N			√		√			√			√		
57	be	do	P	N	--	Y	√			√						√			√

58	*barn*	*bar*	Y	N	--	Y	√			√				√			√		
59	*flaw*	*flew*	P	P	--	Y	√			√				√			√		
60	*glanced*	*glance*	Y	Y	P	N		√		√				√			√		
61	*bathing*	*bathing*	Y	N	--	N			√		√			√			√		
62	*slightly*	*slight*	P	N	--	Y	√			√				√			√		
63	*$freel*	*frail*	Y	N	--	N			√		√			√			√		
64	*this*	*his*	Y	Y	N	N	√			√				√				√	
65	*to*	*and*	Y	Y	N	N	√			√						√			√
66	*These*	*This*	N	N	--	N			√				√	√				√	
67	*$djandjerine*	*gangrene*	Y	N	--	N			√		√			√			√		
68	*it*	--	Y	Y	N	N	√			√				----------			----------		
69	*drew*	*draw*	Y	P	--	N		√			√			√			√		
70	*not*	*no*	P	P	--	N		√					√	√				√	
71	*$wretcht*	*wretched*	Y	N	--	N			√		√			√			√		
72	*Hospital-orderly*	*Hospital-orderlies*	N	N	--	P			√				√	√			√		
73	*an*	*a*	P	P	--	N		√					√	√				√	
74	*wanted*	*wants*	Y	P	--	N		√			√			√			√		
75	*blend*	*bend*	Y	N	--	N			√		√			√			√		
76	*$convaliscent*	*convalescent*	Y	N	--	N			√		√			√			√		
77	*field*	*fields*	Y	P	--	N		√			√			√			√		
78	*$horizont*	*horizon*	Y	N	--	N			√		√			√			√		
79	*$lovlest*	*loveliest*	Y	N	--	N			√		√			√			√		
80	*/rIpInz/*	*ripens*	Y	N	--	N			√		√			√			√		
81	*there*	*where*	P	P	--	Y	√			√				√			√		
82	*learn*	*lean*	P	N	--	Y	√			√				√			√		
a. Total Miscues 82			COLUMN TOTAL				26	12	44	27	41	2	12	68	4	5	62	11	4
b. Total Words 1,879			PATTERN TOTAL				82			82				77			77		
a ÷ b x 100 = MPHW 4.4			PERCENTAGE				32%	15%	54%	33%	50%	2%	15%	88%	5%	6%	81%	14%	5%

Appendix F: Cheng and Caldwell-Harris' Coding

(I) Pure Substitution Errors: The replaced words have only one kind of linguistic relation with the target words, either semantic, phonological or orthographic.

(i) Semantic substitution errors: The replaced words are related to the target words in meaning, without sharing any phonological or orthographic relationship. They could be similar in meaning (e.g., replacement of 由 *you22* 'from' with 從 *cong2* 'from'), be thematically related, or be taxonomically related (e.g., replacement of 問 *wen4* 'to ask' with 說 *shuo1* 'to say').

(ii) Phonological substitution errors: The replaced words are related to the target words in pronunciation. They share at least 2 phonemes (e.g., replacement of 光 *guang1* 'light' with 廣 *guang3* 'wide'; replacement of 風 *feng1* 'wind' with 方 *fang1* 'square'). There is no semantic or orthographic relation between the replaced words and the target words.

(iii) Orthographic substitution errors: The replaced words are related to the target words in form. They share at least one character component (e.g., replacement of 運 *yun4* 'transport' with連 *lian2* 'link'; replacement of 問 *wen2* 'to ask' with 間 *jian1* 'between'). There is no semantic or phonological relation between the replaced words and the target words.

(II) Combined Substitution Errors: In this type of error, the replaced words have 2 or 3 kinds of linguistic relation with the target words.

(iv) Semantic + Phonological substitution errors: The replaced words are related to the target words in meaning and pronunciation (e.g., replacement of 顆 *ke1* 'classifier for round objects' with 個 *ge* 'classifier for anything'). There is no orthographic relation between the replaced words and the target words.

(v) Semantic + Orthographic substitution errors: The replaced words are related to the target words in meaning and form (e.g., replacement of至 *zhi4* 'to' with 到 *dao4* 'to'; replacement of 線 *xian4* 'thread' with 絲 *si1* 'thin thread'). There is no phonological relation between the replaced words and the target words.

(vi) Phonological + Orthographic substitution errors: The replaced words are related to the target words in pronunciation and form (e.g., replacement of 忱 *chen2* 'sincerity' with 枕 *zhen3* 'pillow'). There is no semantic relation between the replaced words and the target words.

(vii) Semantic + Phonological + Orthographic substitution errors: The replaced words are related to the target words in meaning, pronunciation, and form (e.g., replacement of 氨 *an1* 'ammonia' with 氮 *dan4* 'nitrogen').

(III) Miscellaneous Errors: Miscellaneous errors including the following error types.

(viii) Insertion: A word was inserted into the passage during reading aloud.

(ix) Inversion: The order of two words was switched.

(x) Omission: A word presented in the passage was omitted during reading aloud.

(xi) Morphological substitution errors: The replaced word is derived from the target word or vice versa (e.g., replacement of *person* with *personality)*. This type of error only occurred to native English readers in Experiment 2, but not to native Chinese readers in Experiment 1 and 3.

(xii) Function-word substitution errors: A function word (e.g., *the)* is replaced with another function word (e.g., *a)*. This type of error, like morphological substitution errors, only occurred to native English readers.

Appendix G: Informed Consent and Assent Forms

Informed Consent Form

Title of Research Study: Adolescent Second Language Reading: A Longitudinal Study of the Effects of Retrospective Miscue Analysis and Word Study on Reading Performance
Protocol Number: 2700E
Principal Investigator: Melissa Latham (Boston University, Doctoral Student)

The purpose of this research study is to learn more about the effects of an intervention on adolescent second language learners' reading performance. I expect that it will take about 25 hours of your child's time over the course of the summer. About 10 students will be taking part in this study.

Your child will complete all parts of the study during the ESL Summer Clinic. Your child will be asked to:

- Fill in a questionnaire of about 10 questions about their language background.
- Take a test of their reading level 2 times over the course of the summer.
- Participate in activities about English word parts.
- Answer interview questions about their knowledge of English word parts.

The activities will involve a new instructional technique on improving reading in English and will last for four weeks.

Student will also be audio-taped during the study. It is a requirement of participating. If you don't wish for your child to be audio-taped, please do not sign this consent form. Please note that the tape will only be used for the research and will be destroyed when the study is complete.

There are no costs associated with this study.
There are no foreseeable risks to participating. If any new risks present themselves you will be informed of them in a timely manner.
There may be no direct benefits besides the educational experience of participating in the study. However, I expect that the findings may help to inform the future instruction of reading for adolescent second language learners. There will be no compensation for participating in this study. Your alternative is for your child not to participate in this study. However, not participating will not prevent your child from receiving instruction during the ESL Summer Clinic. Participation is completely voluntary. Refusal to participate will not involve any penalty or loss of benefits to which you and your child are otherwise entitled. You may decide anytime if you do not wish for your child to participate, even after signing the consent form.

The data collected will at no time be directly linked to your child's information. There will be a code assigned to your child's data and the code will be kept separate. All data

Study Title: Adolescent Second Language Reading: A Longitudinal Study of the Effect of Retrospective Miscue Analysis and Word Study on Performance
IRB Protocol Number: 2700E
Consent Form Valid Date: 6/7/12
Study Expiration Date: 10/31/12

will be kept in locked cabinets or a password protected computer. The members of the research team and the Boston University Institutional Review Board may access the data. The results of this study may be published in a scholarly book or journal, presented at professional conferences or used for teaching purposes. However, your child's name and other identifiers will not be used in any publication or teaching materials.

Contacts:
You may ask more questions about the study at any time. Please e-mail the principal investigator at mlatham@bu.edu or telephone (617) 272-0342 with any questions or concerns about the study. In addition, you may contact my advisor Professor Cathy O'Connor at mco@bu.edu. You may obtain further information about your child's rights as a research subject by calling the **BU CRC IRB Office at (617) 358-6115**.
Should you decide at any time during the study that you no longer wish your child to participate, you may withdraw your consent and discontinue your child's participation without prejudice.

I confirm that the purpose of the research, the study procedures, the possible risks and discomforts as well as benefits have been explained to me. All my questions have been answered. I have read this consent form. My signature below indicates my permission for my child to participate in this study and to be audio-taped during the study.

_____ _____
Signature Date

_____
Printed Name

_____
Printed name of person obtaining consent

_____
Signature of person obtaining consent

Study Title: Adolescent Second Language Reading: A Longitudinal Study of the Effect of Retrospective Miscue Analysis and Word Study on Performance
IRB Protocol Number: 2700E
Consent Form Valid Date: 6/7/12
Study Expiration Date: 10/31/12

Boston University

RESEARCH ASSENT FORM
Children 12-17 Years of Age

Title of Project: Adolescent Second Language Reading: A Longitudinal Study of the Effects of Retrospective Miscue Analysis and Word Study on Reading Performance
Principal Investigator: Melissa Latham (Boston University, Doctoral Student)

Study Background and Purpose
I want to tell you about something I am doing called a research study. A research study is when people collect a lot of information to learn more about something. A research study may be like a science experiment or collecting information to solve a mystery. The researchers are doing this study to learn more about how English language learners develop reading skills English and what helps English language learners read well in English. I would like you to be in the study because you are an English language learner.

After I tell you about it, I will ask if you'd like to be in this study or not.

What Happens in this Research Study
If you agree to be in the study, you will be taught two techniques to help improve reading in English.

By participating, five things will happen. You will:

- fill in a questionnaire of 10 questions about your language background.
- take a test of your reading level 7 times over the course of the year.
- read text passages aloud and review an audio recording of your reading aloud.
- participate in activities about English word parts.
- answer interview questions about your knowledge of English word parts.

The research will take place at: Belmont High School.
The research will last for the school year. You will do the activities above during tutoring time, after school if you are free, or anytime during the school day when you are free.

There are no costs, risks or discomfort associated with this study.

Benefits
There is no direct benefit from participating in this research study. Some studies have shown that your reading in English might improve if you use the techniques I will be teaching. However, this may not happen for you.

Boston University

RESEARCH ASSENT FORM
Children 12-17 Years of Age

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- read text passages aloud and review an audio recording of your reading aloud.
- participate in activities about English word parts.
- answer interview questions about your knowledge of English word parts.

The research will take place at: Belmont High School.
The research will last for the school year. You will do the activities above during tutoring time, after school if you are free, or anytime during the school day when you are free.

There are no costs, risks or discomfort associated with this study.

Benefits
There is no direct benefit from participating in this research study. Some studies have shown that your reading in English might improve if you use the techniques I will be teaching. However, this may not happen for you.

Even though you might not benefit, if you participate in this research it could help others by helping researchers and teachers better understand how English language learners develop reading skills in English.

Costs/ Payments
The only cost to you for this research is your time. You will not be paid to participate in this research study.

Confidentiality
I will do my best to keep the information that you tell me as part of the research private. I will explain to you how I will do this. When I write or talk about you in my research, I will not use your name. I will tell you if I plan to tell your parents, teachers or others any information that I learn from you while doing this research. The information I obtain will be given a code and the code that links to your name will be kept separate.

Even though I will try to keep the information private there is a chance that someone who is not part of the study will learn some private information about you if you join this research study. Ask me about this if you have any questions.

Voluntary Participation
Do you have to be in this study? No, you don't. No one will make you if you don't want to do this. Just tell me if you decide not to do it. No one will be mad at you or change how they take care of you because you don't want to participate. Your grade will NOT be affected if you decide not to participate. Also, you will still be able to receive the tutoring if you decide not to do this research study.

If you decide to join and then later change your mind it is ok. If you decide to join but then don't want to answer some of the questions now or later that is ok.

Contacts
If you have questions regarding this research or if you think you are being hurt by the research now or later you or your parents can contact Melissa Latham at 617-294-1455; mlatham@bu.edu or her advisor, Professor Catherine O'Conner at mco@bu.edu

Agreement to Participate

If you sign this assent form it means that you have read it or it has been read to you. It also means that you have been given the chance to ask questions about the study and your questions have been answered. If you sign this it means that you are agreeing to participate and no one is forcing you.

I will give you a copy of the consent form if you wish.

_____
Name of Subject

_____ _____
Signature of Subject Date

_____
Printed name of person obtaining consent

_____ _____
Signature of Person Obtaining Consent Date

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