Effects of Variations of Text Previews on the Oral Reading of Second Grade Students

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy

EFFECTS OF VARIATIONS OF TEXT PREVIEWS ON THE ORAL READING OF SECOND GRADE STUDENTS

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The purpose of this study was to test the hypothesis that there is a reciprocal relationship between comprehension and fluency during reading. The notion that oral reading fluency can facilitate reading comprehension is well established in the research literature on the development of reading comprehension. However, more recent models have questioned the unidirectionality of this relationship and have suggested that reading comprehension may increase fluency through reading rate. This hypothesis was examined via analyses of second grade students’ oral reading of connected texts. Four previewing conditions which isolated lexical effects, comprehension effects, and prosody effects on oral reading fluency were manipulated in an experiment and the effects on students’ passage reading times and prosody were evaluated. Students who were on-level readers were randomly assigned to one of four experimental conditions consisting of word preview (lexical factor), listening preview (prosody and comprehension factor), summary preview (comprehension factor) and no preview. Following the preview, students were asked to read passages aloud. Analyses of Covariance were performed to test the effects of lexical priming, comprehension priming and prosodic modeling on oral reading fluency as measured in correct words per minute (CWPM) and prosodic reading, while controlling for students overall achievement in reading as measured by the STAR-R score. The results showed significant differences in CWPM favouring the listening
preview and summary preview over the no-preview condition for students at lower levels of fluency performance. The results are discussed in relation to theories of reading that highlight the role of comprehension and fluency in the integration of information during reading.
DEDICATION

This study is dedicated to all the children who struggle with the challenge of reading

and

to their parents, who nurture and encourage them

and

to their teachers, who motivate and challenge them to overcome.
ACKNOWLEDGEMENTS

While the dissertation process began as one of my greatest challenges, it provided me with a tremendous feeling of accomplishment and fulfillment. I will forever value the people who inspired me and supported me throughout this incredible journey.

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CHAPTER 1

Introduction

For over 30 years, I taught in the government schools on a small island in the Bahamas. One year I was the designated homeroom teacher to the highest achieving twelfth grade class in the only high school on this island. Time spent in homeroom varied from 30 minutes to 3 hours or more per day depending on planned school activities or unexpected community interruptions. Insisting my students utilize this time productively, I established a “book club” in which the class could read and discuss a novel rather than flit away valuable time chatting and catching up on community gossip.

The first selection, *To Kill a Mockingbird*, was chosen because it was one of the required texts for the international General Certificate of Education Literature Examination. Since very few students opted to write this exam, I felt this was an adventitious opportunity to expose all of my students to a Pulitzer Prize award-winning piece of classic literature. To stimulate interest and motivation I read the first chapter aloud to the class. To ensure students understood the passage, the class discussed the material through teacher-guided questioning. After introducing the vocabulary for the next section, the students enthusiastically stated that they couldn’t wait to read the second chapter for the home activity. However, subsequent questioning and discussion of chapter two made it apparent that they did not understand the assigned text.

The immediate explanation was to assume they had not done the reading, so I decided the students would take turns reading the chapter aloud in class. I asked Shantell, an outstanding student who was constantly called upon to read at school assemblies
because of her fluent reading, to begin reading the section which contained a lot of
dialogue. She had no problem reading the words but her oral reading of the passage was
was uncharacteristically void of expression. Once again my students were incapable of
responding to questions posed after Shantell’s reading. I, then, prosodically reread the
same section. When I stopped, one of the students immediately remarked, “We
understand it so much better when you read it to us!” The majority of the class concurred.
These very capable students did not struggle with decoding or accuracy in word-
identification; they struggled to read fluently. More interestingly, they struggled to
understand the content of the text as presented in Shantell’s rendition. In light of this
incident I began to question the relationship between oral reading fluency and reading
comprehension which then became the catalyst for this research study.

Statement of the Problem

The role of fluent reading is presently receiving heightened awareness as a result
of the publication of the Report of the National Reading Panel (National Institute of
Child Health and Human Development [NICHD], 2000), which identifies fluency as one
of five critical components of reading instruction. Currently recognized as a crucial skill
in the attainment of reading comprehension, oral reading fluency (ORF) has been
elevated from the ‘neglected goal’ (Allington, 1983; NICHD, 2000), to “the bridge that
the reader must traverse to get from word recognition to comprehension” (Armbruster,

Research has demonstrated that ORF is a complex theoretical construct that is
inextricably interrelated with every process and subskill involved in reading (Nathan &
Stanovich, 1991). Researchers have additionally demonstrated that there is a relationship between ORF and improved comprehension and that ORF is a reflection of overall reading competence (Adams, 1990; Deno, Mirkin, & Chiang, 1982; Fuchs, Fuchs, Hosp & Jenkins, 2001; Fuchs, Fuchs, & Maxwell, 1988; National Assessment of Education Progress [NAEP], 1995, 2005; NICHD, 2000; Yavanoff, Duesbery, Alonso & Tindal, 2005). However, the equivocality that exists in understanding and interpreting the complexity of this interconnection has resulted in conflicting theoretical models to explain the relationship. Predominately, research has viewed ORF as being equivalent to the rate and accuracy of word identification and has determined fluency to be a prerequisite for reading comprehension. Recently, however, the model has evolved that acknowledges a possible causal and reciprocal relationship between fluency and comprehension. The role of reading fluency in the reading process needs further clarification in order to better serve the needs of the thousands of struggling readers in the nation’s school system.

**History of Oral Reading Fluency**

Historically, the rudiments of fluency originated in the discipline of psychology through the research of three experimental psychologists: William James, James McKeen Cattell and Edmund Huey. James (1890) an American psychologist and philosopher, through his seminal book *Principles of Psychology* offered a review of contemporary views in psychology and was the first to introduce the concept of unconscious attention and automaticity when he addressed the topic of completing a complex task effortlessly. In the chapter on ‘Habit” he identified practice and repetition as a means of performing a
task with ease when he wrote that practice or habit “diminishes the conscious attention with which our acts are performed” (p.74).

A few years later, James McKeen Cattell, (1886), an American psychologist, conducted experiments in reaction times to letters, words and colours and discovered that participants took about twice as long to see and name colours than to read letters and words. He also observed that words were read at the same rate as letters. He wrote, “We do not therefore perceive separately the letters of which a word is composed, but the word as a whole” (Cattell, 1886, p. 74). Cattell was the first to intimate that the reading process was automatic in nature: “in the case of words and letters the association between the idea and the name has taken place so often that the process has become automatic” (p. 65). He also observed that familiarity with a language and the influence of syntactic and semantic information resulted in faster reading rates.

In his 1908 publication of the first text on reading entitled *The Psychology and Pedagogy of Reading*, Huey reported on a series of experiments using a tachistoscope in which he showed that individuals were able to read words containing up to eight letters as fast as it takes to read an individual letter. Huey came to view the development of fluent reading as the result of acquiring and combining component cognitive actions, which after sufficient practice, amalgamate. He contended that, “repetition progressively frees the mind from attention to details, makes facile the total act, shortens the time, and reduces the extent to which consciousness must concern itself with the process” (p. 65). Huey’s contention that slow readers read faster after multiple rereadings of a passage was the introduction to the concept which most scientists presently refer to as automaticity in
reading (LaBerge & Samuels, 1974). Amazingly, over a century ago, Huey identified the existence of constructs in reading that have continued to play a prominent role in contemporary reading theories that are informing classroom instruction.

For the past century, researchers have expended considerable effort, to validate what James, Cattell, and Huey have described. In fact, very little work on reading fluency was noted until the publication of the classic article *Toward a Theory of Automaticity Information Processing in Reading* (LaBerge & Samuels, 1974). LaBerge and Samuels argued that reading involves two activities: 1) word identification and 2) comprehension. Since individuals are capable of focusing attention on only a single process at a time, one of these processes had to be accomplished with utilizing little or no cognitive resources. It was further argued that word identification skills, such as decoding, could be practiced and learned to a degree of automaticity. Once this was accomplished, all of the cognitive resources could be preserved and devoted to higher level processes such as gaining meaning from text. Further discussion of this work will be presented in the next section of this document.

*Significance of the Proposed Study*

In 2001-2002, nearly 2.9 million children with disabilities in the public schools in the United States received special education services. This is an increase of 64% since 1977. More than half of these children are identified as having specific learning disabilities of which the majority have difficulties in the area of reading (*24th Annual Report to Congress on the Implementation of the Individuals with Disabilities Education*
Act, 2002). Furthermore, Torgesen and Hudson (2006) reported that reading dysfluency is a burgeoning problem that is very difficult to remediate in older struggling readers.

For over a half century research has examined two components of fluency, rate and accuracy, in an attempt to predict reading comprehension. Reviews of the research on fluency have established the link between fluency and reading achievement (Chard, Vaughn, & Tyler, 2002; Kuhn & Stahl, 2000; Rasinski & Hoffman, 2003); however, there is limited research examining the role of oral reading fluency and reading comprehension. Therefore, little is known about fluency factors. Over a quarter of a century ago, Golinkoff (1975-1976), in her examination of the factors that affect proficient reading, had this to say about the three components of fluency:

The way in which these individual components come together during reading comprehension, how one influences the other, and how deficiency in one affects the others is still not known (p. 653).

Wolf and Katzir-Cohen (2001) contend that further research is needed because our present knowledge of the depth and the extent of the influences of individual component processes to fluency and the relationship between fluency and reading comprehension has yet to be ascertained. They specifically identify the need to establish a developmental and component-based definition of fluency as well as conducting investigations into the development of these components. Research that isolates the components of ORF through application of experimental procedures is needed in order to acquire a greater understanding of fluency components as well as fluency problems in children.
Thus far, experiments directly testing the contribution of oral reading fluency to reading comprehension consist only of tests of decoding and listening comprehension. These studies investigated or modified the simple view of reading (Hoover & Gough, 1990) which perceives skill in reading to be the product of two psychological processes: decoding ability and listening comprehension. Other studies have added the constructs of processing speed (Joshi & Aaron, 2001; Tiu, Thompson, & Lewis, 2003; Wolf & Bowers, 1999) or ORF (Jenkins et al, 2003) to the equation of the simple view of reading. Although the effect of processing speed produced mixed results, ORF was found to significantly predict reading comprehension (Deno, Mirkin, & Chiang, 1982; Fuchs, Fuchs, & Maxwell, 1988; Jenkins & Jewell, 1993).

Moreover, existing research mainly comprises clinical studies (Jenkins, 2001; Torgesen, 1986) or correlational research (Breznitz, 1987; Schwanenflugel, Hamilton, Kuhn, Wisenbaker, & Stahl, 2004) so that there are many unresolved theoretical and methodological issues with regards to ORF. Also, according to McGuinness (2004) the correlational studies have been conducted on students whose slow reading is accompanied by many errors.

Throughout the nation, publishers of basal readers are now integrating a fluency component into curriculum development as a result of the report from the National Reading Panel ([NRP], 2000) identifying reading fluency as one of the major components of reading growth which warrants instructional and assessment attention in Kindergarten through third grade. According to Torgesen (2005), many of these programmes are being marketed as a tool that will not only target growth in ORF, but will promote gains in
reading comprehension of complex text. Furthermore, policy makers, working on the assumption that ORF will improve comprehension, are mandating benchmark assessments of ORF to guide high-stakes educational decisions. Results from these assessments are used to identify and classify at-risk students and to determine eligibility for special education services (Wood, 2006). For instance, with the enactment of Public Law 108-446 (Individuals with Disabilities Education Improvement Act of 2004 [IDEA 2004]) many local agencies have implemented a Response to Intervention programme. One approach has been the development of a three-tiered intervention model to prevent reading difficulties (University of Texas System/Texas Education Agency, 2003). Tier 2 and Tier 3 have been designed to provide additional instruction to those students who do not make adequate progress in the general education classroom, Tier 1. Data from fluency assessments are being used to determine qualification and exit criteria for Tier 2 and Tier 3 instruction.

**Research Aims**

This study aimed to investigate the relationship between reading fluency and comprehension with the goal of understanding the direction of the effects of one on the other. This study consisted of 181 second grade students in an experiment that varied the conditions under which readers are exposed to a text prior to assessing their oral reading fluency. The variation in the conditions is an attempt to isolate facilitation effects stemming from prosodic comprehension and lexical factors.

Given that this study did not involve an instructional intervention, it did not aim to have a long term impact on the participants’ fluency or comprehension. The goal of
this research was to demonstrate the immediate effects produced by the various experimental conditions on ORF. It was my hope that the results of this study could contribute to informing the development of interventions created to strategically improve and develop students’ fluency in the long-term.

The information from this study should contribute to a greater understanding of the rather new and perhaps counterintuitive perspective that characterizes the relationship between ORF and reading comprehension as one that is reciprocal. This study intended to design a direct test of this hypothesis in order to address issues of causality and direction. Therefore, the significance of this research was limited to a theoretical contribution to the study of the relationship between reading fluency and reading comprehension.
CHAPTER 2

REVIEW OF THE LITERATURE

Overview

The review of the research literature is organized into five sections which will develop and constitute the foundation for this proposed study. The first section of the review traces the origin of current conceptualizations of oral reading fluency. A second section reviews research that establishes the relationship between ORF and reading comprehension and that highlights the theoretical models that have been proposed to explain the relationship between the two. In the third section, there will be a review of the literature on the measurement and operationalization of ORF. Section four contains a review of the research literature that evaluates instructional approaches for developing students’ fluency including prosodic modeling, text previewing, word previewing and passage summarizing. The chapter will conclude with arguing that it is possible to isolate and estimate the magnitude of comprehension effects on fluency through the manipulation of experimental conditions consisting of previews that simulate the instructional scaffolds used in several of the intervention studies. The previewing conditions in the experiment were modeled after strategies that have been designed to promote the growth in reading fluency and that have proven effective through empirical evaluation as discussed in the last section of the review.
What is Oral Reading Fluency?

Definition of Oral Reading Fluency

Even though there is a long-standing body of research spanning four decades that links ORF to the development of reading proficiency, there is no universally accepted definition of ORF. To the contrary, there are multiple definitions with different constructs to operationalize reading fluency. Samuels (1979) deems ORF as the ability to read with speed and accuracy. This commonly accepted definition was employed by Therrien (2004) in his meta-analysis of the literature on fluency and comprehension gains and has been adopted by other researchers (Shinn, Good, Knutson, Tilly, & Collins, 1992; Speece & Ritchey, 2005). Another commonly used definition is the ability to process text accurately and with simultaneous comprehension (Hasbrouck & Tindal, 1992; Otaiba, Kosanovich-Grek, Torgesen, Hassler, & Wahl, 2005). And yet, another widely accepted definition is that of the NRP (2000) in which fluency is defined as “reading text with speed, accuracy, and proper expression” (3-1). Meyer and Felton’s (1999) definition of fluency as “the ability to read connected text rapidly, smoothly, effortlessly, and automatically with little conscious attention to the mechanics of reading, such as decoding,” (p. 284) subtly refers to appropriate use of prosody. Allington (1983) and Dowhower, (1987) recognize prosodic reading to consist of critical spoken language features that account for expressive reading, of which Rasinski (1990) posits is necessary to maximize comprehension. Richards (2000) defines fluency as the ability to project natural pitch, stress, and juncture of spoken word or written text automatically and at a natural rate.
Even though a unified definition of oral reading fluency does not exist, most researchers agree that fluency is a complex, multifaceted skill that is an aggregate of three discrete components which generate a distinct process. These three components are: (1) accuracy of word recognition (2) speed of word recognition, and (3) prosody. Also, most all of the current definitions of fluency tend to regard the components of fluency as outcomes of learned skills (Wolf & Katzir-Cohen, 2001). Once the reader masters skills in lexical, phonological and syntactical processes, the by-product is effortless reading with good comprehension.

For the purpose of this study, and keeping these three ORF components at the forefront, the definition for oral reading fluency will adopt that of Hudson, Mercer, and Lane (2000), who after a comprehensive review of fluency definitions, concluded that defining fluency as “accurate reading at a minimal rate with appropriate prosodic features (expression) and deep understanding” was the most comprehensive definition of fluency (as cited by Torgesen, Rashotte, & Alexander 2001, p. 335). To further guide the conceptualization of prosody I will incorporate the NAEP’s (Daane, Campbell, Grigg, Goodman, & Oranje, 2005) definition, in which they define fluency as the ease or “naturalness” of reading. The key elements include (a) grouping or phrasing of words as revealed through the intonation, stress, and pauses exhibited by readers; (b) adherence to author’s syntax; and (c) expressiveness of oral reading-interjecting a sense of feeling, anticipation, or characterization. The combination of these two definitions is appropriate because collectively they recognize the significance all three components of ORF. Understanding the peculiarity of each component is necessary to examine theoretical
relationships between ORF and reading comprehension. Therefore, ORF will be defined as the ability to read connected text accurately and with little conscious effort, so that deep meaning is acquired. Acquisition of comprehension is manifested through phrasing of words, adherence to author’s syntax and interjecting a sense of feeling, anticipation or characterizing through expressiveness of reading.

Ironically, as researchers attempt to clarify the construct of ORF, the lucidity of this concept actually becomes dim and opaque through these multiple and nebulous definitions. For example, terms such as “natural rate”, “appropriate prosodic features”, “naturalness of reading” and “a sense of feeling, anticipation or characterizing through expressiveness of reading” are imprecise and hazy. Consider, Torgesen and Hudson’s (2006) identification of the following three key elements of fluent reading: (1) accurate reading of connected text, (2) at a conversational rate, (3) with appropriate prosody. Exactly, how does one define “conversational rate” and “appropriate prosody”? The natural rate for speaking English is about 250 to 300 words per minute (wpm). This is considerably faster than the second grade reader who reads about 90 wpm.

Even though ORF may be a complicated and complex construct to define, it is easily recognized. Kame’enui & Simmons (2001) eloquently describe a listener’s response to fluent reading:

Fluent reading…is intrinsically elegant in both form and cadence. We certainly know it when we see it, and we are quick to celebrate it, along with the trajectory of success it portends (p.203).
Components of Fluency

Once the construct of ORF is understood, it is necessary to clarify and define each of its three components. Accuracy is exactitude in decoding. When applied to an alphabetic writing system with a deep orthography such as the English Language, this requires foundations in the alphabetic principle, phonemic and phonological awareness as well as immediate access to high frequency function words. Reading rate consists of identification of words in a fluent manner as well as the “fluidity with which a reader moves through connected text” (Torgesen & Hudson, 2006, p. 133). This attribute of fluency is cultivated through many opportunities to print exposure and practice with written text. Once these processes have become encapsulated, reliance on phonics or context cues for word identification is no longer compulsory (Share & Stanovich, 1995). Two components of ORF, speed and accuracy, have been the main focus of research studies since the publication of the seminal 1974 article by LaBerge and Samuels. The constructs of speed and accuracy are readily observable and commonly measured as reading rate per minute (WPM) and words read correctly from a passage per minute (WCPM); however, it is the interpretation that is problematic. ORF is not just the sum of the time it takes to read each word, it also includes the time needed to accomplish integrative processes, some unknown tertium quid, that can only occur if you have comprehended (Beringer, Abbott, Billingsley, & Nagy, 2001; Schwanenflugel, et al., 2004).

Prosody is allied with similar measurement complexities. Very little is known about the nature of prosody because of the dearth of research examining oral reading
prosody. Prosodic reading is considered to be synonymous with expressive reading of the text through use of oral language features such as pitch, stress and intonation (Allington, 1983; Dowhower, 1987; Schreiber, 1980, 1991; Schwanenflugal, et al., 2006) and is considered to be one of the hallmarks of fluent reading (Schwanenflugal, et al., 2004). Dowhower (1991) broadens the concept of ORF to include suprasegmental features of prosodic reading, which expand the unit of phonemes, to encompass the rhythmic and melodic patterns of oral reading. During oral reading, suprasegmental features reveal more information than simply that of the meaning of the word and they incorporate inflectional attributes such as timing and signalling of sentence type. Dowhower (1991) identifies six markers that comprise expressive reading and are indicative of a reader’s ability to organize or segment text into meaningful phrases. These markers are:

(1) **pausal intrusions**  
Inappropriate hesitations within words or within syntactical units  
Example: ca/lt; on the // mat (p. 166)

(2) **length of phrases**  
Better readers read more words between pauses than poorer readers and are able to organize text into word chunks

(3) **appropriateness of phrases**  
A group of words that is syntactically/phonologically acceptable.  
Example of inappropriate phrases occurs when punctuation is ignored (p. 167)

(4) **phrase-final lengthening**  
The last stressed syllable of a phrase is longer than the same syllable in a non-phrase-final position.  
Example:  
1. After school, care is critical for a younger child.  
2. After school care is critical for a younger child.  (p. 167)
terminal intonation contours
The pitch at the end of a sentence
The primary factor influencing reading-rate level and is similar to naming speed

Stress
The intensity with which a phoneme, syllable or words is uttered as well as patterns for accenting phrases and sentences
Examples:
That’s just in sight. That’s just insight.
A representation of listening comprehension (p. 168).

Students who use these markers have made the connection between written and oral language because their oral reading is accurate and at an appropriate rate and exhibits the features of expressive oral language required for ordinary discourse. In actuality, prosodic readers are chunking or segmenting the written material into meaningful units and evidence of this is manifested through oral reading that models speech.

The multiple components of ORF highlight the complexities involved in becoming a fluent reader. Therefore, it is feasible that there can exist more than one area of dysfluency (Wolf & Katzir-Cohen, 2001). Meyer and Felton (1999) have identified three profiles of nonfluent reading: slow recognition of individual words, lack of sensitivity to prosodic cues, and failure to make higher order semantic connections between words, meanings and ideas. Students can exhibit characteristics of dysfluent reading through decoding weaknesses due to phoneme awareness deficits that occur in lower level processes of phonological awareness and phonological processing skills. Also, when decoding skills are intact, deficits in naming speed or both (double deficit hypothesis, [Wolf, 1991; Wolf & Bowers, 1999]) can hinder speed of lexical access. Another area of dysfluent reading occurs when students possess accurate decoding skills
but are unable to grasp the syntactic structure of the text. Finally, dysfluency can occur even when rapid single word identification and phrasal knowledge are present. According to Adam’s (1990) connectionist theory to fluent reading, the reader must engage four interactive processes of orthography, phonology, meaning and context, in order to learn morpheme patterns or units which aid in constructing meaning from the text. Lack of activation of any one of these processes could result in reading dysfluency. Schreiber (1980) concisely defines dysfluent reading to be simply the inability to transfer oral language characteristics to written text.

**Summary**

This section demonstrated the complexity in the nature of ORF and complications can arise when attempting to examine the role of fluency in reading. The term reading fluency is prolific in the literature but there is no unified or precise operational definition. Existing definitions cover a broad range from the explicitness of mechanics of fluency to the imprecise concepts of expression while reading. However, most researchers contend that fluency is not a single construct. Many researchers argue that speed and accuracy are synonymous with ORF. Other researchers expanded the concept beyond these two components to include a postlexical element known as prosody. Because ORF is composed of multiple components, dysfluency can be associated with any one of them, thereby, highlighting the fact that issues dealing with fluency are not necessarily easily resolved.
Theoretical Orientation

Two predominant theoretical frameworks have evolved to explain the importance of ORF and in discerning the underlying causes of fluency deficits. Each theory establishes its foundation on different components of ORF, but both propose fluency to be an agent for comprehension.

Automaticity and Reading

The Theory of Automaticity. The first theoretical premise is based on the assumption that fluency is the product of accuracy and fast word recognition which in turn facilitates reading comprehension. In 1974, early dysfluent reading theories first received attention with LaBerge and Samuels’ theory of automaticity. This information processing model (Norman, 1968) was constructed to explain how people process task-oriented symbolic information. The key elements in this model include attention, visual memory, phonological memory and semantic memory. LaBerge and Samuels’ believe reading consists of two tasks: word recognition and comprehension. Their primary tenet rests on the belief that the lower-level word identification processes, such as lexical segmentation and phonological decoding, demand fewer cognitive resources than those required for comprehension operations. Students who read at slower rates suffer the consequence of recalling less information due to the fact that far more cognitive resources are expended on decoding the individual words than on interpreting the context. The transition from conscious decoding of individual words to fluent reading is accomplished through extensive practice and multiple exposures to print. This theoretical premise builds on Huey’s (1908) research which states:
To perceive an entirely new word or other combination of strokes requires considerable time, close attention and is likely to be imperfectly done, just as when we attempt some new combination of movements, some new trick in the gymnasium or new “serve” at tennis. In either case, repetition progressively frees the mind from attention to details, makes facile the total act, shortens the time and reduces the extent to which consciousness must concern itself in the process (p. 104).

Huey further stated that more complicated and complex, attention demanding acts gradually integrate with practice. Practice increases the development rate of processing and releases the reader from concentrating on details. Huey described and replicated the experiments of Dr. J. O. Quantz to determine normal and maximum rates of reading. It is interesting to note that both researchers discovered that reading rate varied significantly from reader to reader in both silent and oral reading. Individual rates of silent reading of relatively easy text varied from 3.5 words per second to 13.5 words per second. More importantly, Quantz discovered that the comprehension of the rapid readers was 37% superior to the slower readers: “The superiority of the rapid reader is also shown by the fact that his memory of the substance of his reading is more exact than that of the slow reader. He introduces only two-thirds as many thoughts not found in the original selections” (p. 173).

The theory of automaticity garners support from many researchers (i.e., Dowhower, 1987; Shinn, Good, Knutson, Tilly, & Collins, 1992; Snow, Burns, & Griffin, 1998) who contend that automaticity is a necessary component indispensable to the reading process (Perfetti, 1985; Stanovich, Nathan, West, & Vala-Rossi, 1985)

*Expectancy Theory*. According to Posner and Snyder (1975a, 1975b) two independent expectancy processes explain how context can assist with word recognition.
Even though these processes operate in tandem, they differ through their use of attention. The first process is an automatic priming mechanism dependent on semantic cues from the context and automatically and quickly activates the memory for rapid identification and retrieval of words without practice. Words automatically activate both their meanings and those of closely associated words in memory (supported by Neely, 1977). An example of a spreading activation mechanism occurs with the reading of a word such as *cat*. This activates semantic features that make up the word such as *fur, claws, four legs,* etc). The second expectancy process works more slowly and demands conscious attention supported by word knowledge and previously read information in order to identify words. These two processes work together to facilitate accurate and fluent word recognition of words in context.

One of the earliest applications of this was to the Stroop task (Stroop, 1935). Completing this task entails focusing on one dimension of a stimulus while ignoring a competing dimension. For example, a participant could be asked to name a picture or colour while ignoring embedded words or to name the colour a word is written in, such as the word blue, which is displayed in a red font. The process that is considered to be controlled is the naming of the colour because it requires attention. The reading of the word is considered automatic because it does not appear to rely on attention. The response to naming the colour is slowed down because of the presence of the conflicting word. Automatic readers involuntarily read the words, which in turn delays the colour response. According to Bergen, Grimes, and Potter, (2005), this characteristic of
automatic reading is known as autonomy, the ability to commence a task without active engagement.

*Interactive Compensatory Model.* Stanovich (1980) advanced the information processing theory with his interactive-compensatory model of reading fluency. He purports that reading does not rely simply on automaticity and accuracy of decoding, but, in fact, there are multiple sources of information to aid reading comprehension. Stanovich argues that poor readers who struggle with basic bottom-up decoding skills would not be able to master the lower level word identification demands to attain a level of automatic decoding required for proficient reading. Research documents that readers experience contextual facilitation through activation of higher level processes gained from the information contained in each word such as lexical, phonological, semantic and syntactic information to compensate deficiencies in word identification (Share & Stanovich, 1995). The interactive model of reading builds on the theory of the two-process model of expectancy developed by Posner and Synder (1975a, 1975b) and Neely (1977) which introduces the concept of a controlled versus automatic construct.

*Instance Theory.* Other researchers have proposed alternative models of the automaticity theory, with slight variations. Logan (1988) introduced a memory-based theory to explain how automaticity may be viewed as a memory phenomenon that is “item-based, rather than process-based” (Kame‘enui & Simmons, 2001). Logan (1988) argues that a single exposure to a word could leave a sufficient memory trace to allow it to be recognized automatically in the future. In the instance theory of automization Logan perceives the process of word recognition is happening so rapidly that it is an
unconscious act. Automaticity is acquired when the reader retrieves memories of past solutions to task-relevant problems as opposed to completing the steps of an algorithm.

According to instance theory, performance or memory retrieval speeds up. This occurs because as the number of instances increases, there are more opportunities that one of the instances will be retrieved fast. Logan purports that the two simultaneous processes of rapid word recognition and word meaning are the most important aspects of fluent reading. He argues that the instance mechanisms in the instance theory of automaticity could be the cause of reading processes speeding up because he claims that a single-trial automatization makes it possible for automaticity to occur on one repetition. A single exposure to the text permits automatization at every level of the reading process: letter, word, propositional and idea processes. The only prerequisite for this to occur is the reader must encode these relevant structures from memory when they are viewed again.

Logan further argues that automaticity in the instance theory occurs due to the accumulative effect of repetition priming, or the changes in performance that result from repetition. Repetition priming can occur at the letter, word or text level. Therefore, due to multiple repeated readings of a text and the automatization of simultaneous reading processes, readers not only learn specific words and specific combinations of words but the meaning of the text as well. When words are learned, readers are not challenged to apply phonological rules or retrieve pronunciations. Readers can apply prosody when text-level learning occurs because they are able to target words that need emphasis. According to Logan, “Word-level learning interacts with text-level learning; dysfluent word-level disrupts text-level prosody” (p. 141). Therefore, as a reader rereads a text and
is able to correct problems of coordination and control, these corrections from multiple rereadings, permit the reader to read a text with meaning.

*Rauding Theory.* A unique theory, identified as the Rauding Theory, in which efficiency is a measure of rate and accuracy, forms the crux of the model, was proposed by Carver (1977; 1985; 1992; 1993; 2000) to explain the underlying factors which affect the reading process. Rauding is derived from the terms reading, which is defined as an attempt to comprehend language in the form of printed words, and auding (Carver, 1977), which means to comprehend language in the form of spoken words. According to the rauding theory successful acquisition of word recognition via passing progressively through developmental stages facilitates automaticity of word recognition, a requisite for comprehension.

Using what Carver deems as salient features of reading, which are three individual difference factors: reading efficiency level, reading rate level and accuracy level, he developed the rauding theory with the focus on “general reading ability, and can be measured by traditional standardized reading comprehension tests because they are affected by both accuracy level and rate level” (Carver, 1993, p. 453). The rauding theory is composed of five basic reading processes: scanning, skimming, rauding (reading), learning and memorizing. Rauding, the manner in which most reading occurs, is normal reading and is considered the most important type of reading ability. It is measured by efficiency level and focuses on similar aspects of both reading and listening comprehension when readers comprehend sentences in textual materials in relatively easy texts. Efficiency level is considered to be a function of accuracy level and rate level.
Raudamized words are words that are recognized on three levels: a) when spoken, b) accurate pronunciation when seen in print and c) automatic recognition due to overlearning through practice. Comprehension can occur through reading of the material or listening to material being read aloud. Table 1 depicts the components of rauding theory.

Cognitive power (CP), cognitive speed (CS), auditory accuracy level (AudAL), and pronunciation level (PL) are factors that influence the ability to read with speed and accuracy. However, regardless of reading ability, any text containing raudamized words will be read at a constant rate, known as the individual’s rauding rate. In other words, reading will be automatic and can be measured in words per minute or grade equivalents. Therefore, a reader with Rauding Efficiency Level (EL) of 12 can read 12th grade level of text with accuracy when the time allowed for reading is equivalent to a 12th grade reading rate (Carver & David, 2001). According to Carver, rauding and fluent expressive reading possess similar characteristic, but the former refers to silent reading while the latter pertains to oral reading.

Cognitive psychologists (LaBerge & Samuels, 1974; Carver, 1977, 1993, 2000; Perfetti & Hogaboam, 1975; Posner & Snyder, 1975; Stanovich, 1980) believe that the prerequisites skills of speed and accuracy have a facilitative effect on comprehension because fewer cognitive resources are devoted to word recognition, thus authorizing more attention to the operation of higher order thinking and inferencing about the text. This theory is dependent on both automatic and accurate word recognition in order for the reader to interact with the text.
Regardless of the model – theory of automaticity (LaBerge & Samuels, 1974), theory of expectancy (Posner & Snyder, 1975), the interactive compensatory model (Stanovich, 1980, verbal efficiency theory (Perfetti, 1985); instance theory (Logan, 1988), or rauding theory (Carver, 1977; 1993; 2000) - these researchers all agree that without speed and accuracy in decoding of text, there can be little understanding of written material. The facility of the proficient reader to efficiently and effortlessly recognize words frees up cognitive energy for higher level comprehension processing of the text. However, research (Anderson, Wilkinson, & Mason, 1991; Carver, 1990) points out that when the instructional focus is to increase reading rate, one outcome could be a decrease in comprehension. Even the connectionist model (Adams, 1990; Foorman, 1994) incorporates features of speed and accuracy through pretraining and mapping of phonological skills.

All of these models consider oral reading to be an outcome of decoding accuracy. Figure 1 depicts a developmental model of fluent reading by Rasinski (1984) which depicts the roles of speed, accuracy and prosody as governing agents for the processes of comprehension.

This model appears to incorporate the above mentioned theories, including the theory of automaticity (LaBerge & Samuels, 1974) through rapid word decoding and the expectancy theory through the use of contextual word identification. When words are learned, then prosody can be applied (Logan, 1988). The correlational path between the two word-level factors represents the interaction as theorized by Stanovich’s compensatory model (1980). Rasinski’s model clearly points out that these interactive
components of fluency work together as a contributor to comprehension (Breznitz, 1987; Rasinski, 1984).

Prosody and Reading

It was concluded in the NRP’s report (2000) on the analysis of fluency that the theory of automaticity, as an outcome of accurate decoding, needs to be modified. The theory of automaticity accounts for speed and accuracy of word recognition and therefore would associate ORF with requiring only lower-order skills. But this theory negates the role of prosodic reading in the reading process. Conversely, other researchers have expanded this theory to include the third component of ORF-prosody (Dowhower, 1987; O’Shea & Sindelar, 1983; Schreiber, 1980), but little is known about the role of prosody in the acquisition of reading even though the concept of fluency has been around for over a hundred years. Huey (1908) identified the quality of prosodic fluent reading as he wrote:

A main force tending to unitize the sentence both physically and psychically is the alternation of stresses, the rise and fall of pitch, and the variations in quantity, already referred to as factors in producing the rhythm, melody and emphasis of speech. The total sentence-meaning inheres vitally and comes most to expression in these characteristic variations in the sentence-flow. . . . Certain words may be omitted entirely, but they are usually words of relative unimportance, or they are parts which would be unstressed in ordinary speech and whose omission will not affect the natural swing of the sentence. . . . (pp. 140–141).

Reading prosodically, or reading with expression, is indicative the reader comprehends the text so is able to read in a style comparable to oral language (Dowhower, 1991). Because prosodic reading requires lower and higher order processes, it is related to both decoding and comprehension skills. More importantly, prosody may
be an aid to comprehension (Torgesen & Hudson, 2006), a question that motivated this study.

Schreiber (1987, 1991) postulates that regardless of a reader’s ability to decode words, the difficulty in the acquisition of fluent reading lies in the fact that written text lacks the presence of prosodic cues that are clearly demarcated in oral language, such as stress, pitch and intonation. Schreiber stressed that children are sensitive to prosodic signals in syntactic structures and without these prosodic cues students are unable to chunk groups of words in sentences into meaningful phrases. This inability to suprasegment the text hampers comprehension. Studies, in which written text has been segmented into syntactically appropriate phrasing, reported similar gains in reading comprehension (Amble & Kelly, 1970; Spring, Blunden, & Gatheral, 1981; O’Shea & Sindelar, 1983). Even though this model targets a different component of reading fluency, it also views ORF as a moderator of reading comprehension.

Causal and Reciprocal Relationship Theory

Numerous studies on reading fluency literature report a link between fluency and reading proficiency (Anderson, Hiebert, Scott, & Wilkinson, 1985; Chard et al., 2002; Dowhower, 1994; Kuhn & Stahl, 2003, NICHD, 2000; Rasinski & Hoffman, 2003; Strecker, Roser & Martinez, 1998). Recent research has shown oral reading fluency to be a predictor of reading comprehension (Fuchs, Fuchs, Hosp, & Jenkins, 2001; NICHD, 2000; Wood, 2006). The NAEP study (Danne, et al., 2005) reported that there was a strong relationship between the various components of ORF (fluency, accuracy and rate) as well as fluency scores being highly correlated with reading comprehension, as
measured by the NAEP 2002 reading assessment. On average, the students that attained
the highest level of reading performance were the students that had the highest rating on
the NAEP oral reading fluency scale score. Fluency represents a level of expertise that
extends the barriers of accurate and fast word recognition such that reading
comprehension may be aided (NRP, 2000).

Current research has begun to challenge the views that ORF is a prerequisite for
reading comprehension, wherein fluency is equated to rapid speed of word identification.
Shinn et al. (1992) note that it is understood in this conceptual model that decoding
affects comprehension but comprehension does not affect decoding. Researchers have
begun to query the roles of the various components of fluency in comprehending text and
the possibility of a causal and reciprocal relationship between fluency and comprehension
(Allington, 1983; Jenkins, Fuchs, van den Broek, Espin, & Deno, 2003a; Kuhn & Stahl,
2003; Logan, 1997; Pikulski & Chard, 2005; Schwanenflugal, et al., 2006). These
researchers are investigating if speed of access to words is aided because the reader
comprehends the passage rather than speed of word recognition aiding comprehension.
Also, Torgesen and Hudson (2006) pose the following question: “Do children need to
read prosodically to improve their comprehension, or is prosody in reading an index that
comprehension has occurred?” (p. 135).

In an attempt to examine the contributions of context and context-free reading
skill to reading comprehension to support the hypothesis that ORF is a good indicator of
reading competence Jenkins, et al., (2003a), conducted a study with 113 fourth grade
students, with the majority being average readers. They found support that word
recognition skills contribute more to fluency at lower levels while comprehension contributes relatively more to fluency at higher levels. These researchers used curriculum-based measurement to measure reading performance of participants on three formats of a 400 word folk tale passage. The first format was the entire folk tale passage which was written at third grade level readability. The second format was a list of words from the story that were randomly ordered. The last format consisted of randomly reordering the words in the passage into paragraphs without punctuation. Scores on accuracy (words read correctly divided by total words read), speed (words read correctly in one minute) and time (i.e., number of seconds per correct word: one divided by [words read correct divided by 60]) were recorded. The Reading Comprehension subtest of the Iowa Test of Basic Skills was also administered. The order in which the formats were read was counterbalanced to prevent any order effect. The researchers examined the data between the two context-free formats and found the word list to be significantly superior to the random paragraph format, so the random format was excluded from the analysis. Results indicated that comprehension skills play a role in ORF by demonstrating that context reading fluency is a stronger predictor of reading comprehension than list reading fluency.

Additionally, Strecker, Roser and Martinez (1998) state that “the issue of whether fluency is an outgrowth or a contributor to comprehension is unresolved. There is empirical evidence to support both positions” (p. 300). After they examined fluency studies dealing with aspects of fluency and comprehension, they determined that
“Fluency has been shown to have a reciprocal relationship with comprehension, with each fostering the other” (p. 306).

Present research is also beginning to query the concept that comprehension can be considered a function of fluency through the effect of rate and accuracy of word recognition and also that prosody can be considered a function of comprehension. It is through understanding of the printed text that readers are able to apply the characteristics of prosodic reading as identified by Dowhower (1987). To illustrate how understanding of a text affects the ability to read words at an appropriate pace and with appropriate intonation, I submit the following exercise:

Read the following passage with expression.

After completing my Writer’s Workshop course I was highly motivated to write a masterpiece manuscript that I would submit for the writing contest. The award winning paper would be selected and read on a local TV show and would be published in a national magazine. Tirelessly, I laboured until I interwove the intricacies of the details of a clever and extremely unusual hoax. With eagerness, excitement, and anticipation, I took my finished product to the next class. I shared the article with my classmates. They were protented and thought it would be schutwage to read such a piece in front of a large audience.

Consider how expressive reading was affected due to a lack of access to meaning because of the presence of two pseudo words. Prosodic reading abruptly shifts to a neutral, expressionless tone. However, as one considers the following feasible examples of synonym replacements for the pseudo words, the role of understanding on prosodic reading is illustrated.

I shared the article with my classmates. They were horrified and thought it would be humiliating to read such a piece in front of a large audience.
I shared the article with my classmates. They were ecstatic and thought it would be phenomenal to read such a piece in front of a large audience.

There is no question as to how the classmates feel about the writer’s manuscript and the semantic differences signalled by the two sets of synonyms are reflected in the oral reading.

This simple demonstration illustrates that comprehension of word meaning impinges on prosodic reading. It also demonstrates that the ability to process syntactic structures within sentences and paragraphs does not guarantee correct prosodic reading. Therefore, it would appear that word meaning and comprehension also dictate prosody.

Schwanenflugel, et al., (2004) argue this point because they hypothesize that it is possibly through the comprehension of the passage that a reader is able to retrieve words quickly and accurately. The point where readers actively construct meaning from the text is manifested through the appropriate use of elements of oral phrasing or through prosodic reading. Rasinski (2004) believes that this is the point where fluency is directly related to comprehension. Furthermore, Kuhn and Stahl, 2003 state that “Prosody may provide a link between fluency and comprehension” (p.5). This recent theoretical framework, however, lacks specification of the mechanisms that underlie the relationship between ORF and comprehension.

Empirical data supports these theoretical models suggesting strong positive correlations between reading fluency and comprehension, thereby removing any doubt concerning the existence of the interrelatedness of oral reading fluency and reading comprehension (Allinder, Dunse, Brunken, & Obermiller-Krolkowski 2001; Fuchs,
Fuchs, Hosp & Jenkins, 2001; Mathes, Simmons, & Davis, 1992; Nathan & Stanovich, 1991). Furthermore, researchers claim that an increase in performance in one area leads to an increase in the other area. The NRP’s (2000) examination of the literature reported that fluency is directly associated with the process of comprehension because it allows for “preliminary interpretive steps” (3-6). They acknowledge that when reading rate is increased, comprehension was increased. However, there is no definitive response regarding the direction of the relationship. The question arises whether or not multiple readings of a passage increase both reading rate and comprehension because of the several opportunities to interact with the text or does multiple readings prompt understanding of the written text which, in turn, facilitates speed of word identification. If this is the case, comprehension could directly facilitate rapid word recognition through spreading activation as suggested by Posner and Snyder (1975).

To add to this, a recent meta-analysis conducted by Therrien (2004) supported the findings of the NRP with similar and slightly larger effect sizes. They also identified the missing link of ORF and reading comprehension to be a question of causality and/or reciprocity of reading prosody and claimed that this is yet to be determined (Fuchs, Fuchs, Hosp & Jenkins, 2001; Pinnell, DeFord, Lyons, & Bryk, 1995). The conflict between the causal theories of oral reading fluency and reading comprehension arises over whether or not ORF is a product of comprehension or a contributor to comprehension or if bi-directionality exist.

As of yet a model to demonstrate the reciprocal effects of the interrelationship between the components of reading fluency and comprehension processes does not exist.
In Figure 2, I have modified Rasinski’s (1984) model to create a simple hypothetical model of this theory. This model incorporates the above research to visually represent the theoretical premise that comprehension can affect the speed with which words are identified and read in context as well as comprehension affecting improved prosodic reading.

Summary

Some of earliest experiments on fluency began over a century ago in psychology. Contemporary fluency theories are based on this seminal research. Both automaticity and prosody make a contribution to our understanding of reading fluency. The theory of automaticity plays a pivotal role in fluency and is most cited in the literature about fluency. It explains how beginning readers consume considerable cognitive resources on lexical processes but with practice the reader progresses to a level of proficiency where word recognition becomes rapid and automatic. This is the level where cognitive resources are available and can be channelled to interpret the meaning of the text. Stanovich, Logan, Posner and Snyder, Perfetti, and Carver have all made modifications and contributions to expand this theory.

The theory of automaticity accounts for rapid and effortless decoding of fluent readers. However, it negates the role of a fluent reader, reading with expression. When the reader is able to appropriately organize the text syntactically, he or she is better able to read in a manner that is equivalent to oral language. This is indicative that the reader has understood the content of the text.
There are multiple models to account for the interaction between the processes ORF and the processes of reading comprehension. All function on the premise that reading entails the completion of two separate but necessary tasks. The first is to decode the printed text; the second is to construct meaning from the decoded words. These models on fluency make it apparent that the components of ORF assist with comprehension processes.

More recently, research has begun to examine a reciprocal relationship between fluency and reading processes. It is unclear whether the components of ORF are a cause of comprehension or a consequence or if they assist one another.

*Reading Fluency and Reading Comprehension*

Since, as Torgesen (1986) claims, the definition of oral reading fluency does not incorporate comprehension, there are questions as to the relationship between ORF and reading comprehension.

Fluency, a complex task, requiring multiple functioning cognitive skills occurring simultaneously, demands both lower and higher order subskills. Fuchs, Fuchs, Hosp and Jenkins (2001) state that rapid word recognition is built on the subcomponent skills of phonological segmenting and recoding. Initial stages of phonological awareness, incorporating the transfer of letter sounds recognition to identification of letter-sound correspondences, are required prior to recognition of the lexical structure of whole word. After the word is read as an entire unit, the reader must then recode the lexical structure to process the meaning. Once this is completed, the next task is to simultaneously combine the words into phrasal units. The final stage of fluent reading is to group words
into phrases that correspond to oral language and natural speech patterns (Dowhower, 1987; Rasinski, 1990; Snow, Burns, & Griffin, 1998) which is indicative of successful propositional encoding. Therefore, with little or no effort the reader simultaneously recognizes words and comprehends their meaning.

Similarly, Perfetti (1985) in his verbal efficiency theory (VET) discussed fluency concepts in terms of reading ability. He defines reading as a process that demands both speed and comprehension. The central claim of VET is that certain skills, namely, lexical access and syntactic parsing, are necessary for fluent reading. Once textual demands increase, the reader must engage in higher level processes. Therefore, “individual differences in reading comprehension are produced by individual differences in the efficient operation of local processes. The local processes are those by which temporary representatives of text are established” (p. 100). Perfetti identified local processing factors in comprehension ability to include lexical, phonological and semantic processes and their efficiency are affected by elements which include general symbol activation and retrieval, recognition processes, lexical access and retrieval and working memory. Perfetti identifies three key processing levels in text: a) lexical access, b) propositional encoding, and c) text modeling.

During the lexical access process, words are identified because a visual representation is mapped onto a concept in memory and to its phonological representation or pronunciation. In order for comprehension to occur, lexical processes must operate automatically. Then, the next phase of propositional encoding occurs. Here the reader is able to take a group of words that have individual meanings and chunk them together into
an integrated unit of meaning or proposition. This requires skill in ability to identify pronoun referents, infer, sequence and synthesize. This local process operates within or between sentences and requires the reader to hold individual words in memory while seeking appropriate syntactic groupings to create phrase and clause units. Skilled readers are able to perform lexical access and propositional encoding with little conscious effort. According to VET, the level that demands cognitive resources is the text modeling phase. As the text becomes more elaborate, more demands are placed on the reader. But, once the reader executes the previous two stages to a high degree of efficiency, then more resources are available to complete the task of reading.

Thurlow and van den Broek (1997) also substantiated the necessity for inferencing of the text to become automatic in order to fully comprehend the author’s meaning. They identified four classes of inferencing that could be divided in one of two categories: inference to maintain coherence and inference to elaborate on the meaning. Reading is a complex construct that requires certain components of reading fluency to guarantee success, but conceivably reading comprehension may be necessary to enhance the process of fluent reading.

The polemic surrounding the understanding of ORF and reading comprehension could be a result of the very nature of fluency components since, by definition, ORF is not a single construct. Rasinski (1986) noted that researchers have made “the tacit assumption that each factor alone was responsible for fluent reading” (p. 3). Thus, controversy regarding the relationship between fluency and comprehension results directly from which of the three components of fluency one references. For example,
when Strecker et al., (1998) examined 11 fluency studies they reported that there were a total of 10 aspects of fluency targeted as a feature of reading performance. The number of elements reported in each study ranged from two to six, but no two studies observed or measured the exact same elements of ORF.

Also, many researchers claim that two components of fluency are the primary indicators of reading fluency. Automaticity in word identification and word accuracy release attentional focus on decoding; this availability of cognitive resource can then be channelled into gaining meaning from the printed text. Instructional techniques that focus on the mechanisms of automaticity, such as repeated readings, have been investigated to improve ORF. However, most of these techniques target only speed and accuracy of word-recognition, and in some cases, prosody. Therefore, even though dramatic gains in reading fluency are often reported, not all studies found improvement in gains in reading comprehension (Bryant et al., 2000; Levy, Abello & Lysynchuk, 1997; Mathes & Fuchs, 1993; Rashotte & Torgesen, 1985; Vaughn, et al., 2000).

Prosody and Reading Comprehension

The role of prosody in the reading process is not so definitive. How prosodic reading is related to decoding and reading comprehension skills is inconclusive. Research has shown that there is a correlational relationship between prosodic reading and reading comprehension (Allinder, Dunse, Brunken, & Obermiller-Krolikowski 2001; Nathan & Stanovich, 1991) and between reading comprehension and fluency; however, the question of causality and/or reciprocity of reading prosody is yet to be determined.
There are two theoretical models that explain the role of prosody in reading comprehension: a) reading prosody as a partial mediator model and b) reading comprehension as a predictor of reading prosody model (Schwanenflugel, et al., 2004). The first model that advocates prosody as a mediator of comprehension hypothesizes that prosody, independent of speed and accuracy, makes a contribution to aid readers to understand what is being read using syntactic-semantic cues. The second model advocates prosody to be a product of reading comprehension. This model emerges from a cognitive perspective in which prosody is viewed as a result of understanding the text. It hypothesizes that students are able to understand what they are reading which makes it possible for them to input prosodic features into silent and oral reading of the text. Studies have reported that an increase in one area results in an increase in the other (Dowhower, 1987; Herman, 1985).

Prosody as a Mediator of Comprehension. According to the RAND report (2002) fluency plays a dependent and independent role in promoting reading comprehension. From a behavioural perspective, accuracy and speed are a result of rapid word recognition, a prerequisite to comprehension. The theoretical base for this premise emerges from LaBerge and Samuels’ (1974) theory of automaticity. Many researchers agree that the level of automatic decoding is what differentiates good readers from poor readers. Once students have been provided with numerous opportunities to practice with connected text and have had exposure to modeling of expressive renditions, the transition to fluent prosodic reading progresses naturally and these prosodic features may assist a
reader to construct meaning from the text (Dowhower, 1991; Kuhn & Stahl, 2003; Pinnell et al., 1995; Rasinski, 1991; Reutzel, 1996; Schrieber, 1991).

Wolf and Katzir’s (2001) multidimensional view of fluency adopts this same model in their conceptualized definition of fluency:

In its beginnings, reading fluency is the product of the initial development of accuracy and the subsequent development of automaticity in the underlying sublexical processes, lexical process, and their integration in single-word reading and connected text. These include perceptual, phonological, orthographic, and morphological processes at the letter, letter-pattern and word levels as well a semantic and syntactic processes at the word levels and connected-text level. After it is fully developed, reading fluency refers to a level of accuracy and rate where decoding is relatively effortless; where oral reading is smooth and accurate with correct prosody; and where attention can be allocated to comprehension. (p. 219).

They attribute efficacy in speed, accuracy and prosody as a channel to free the cognitive resources necessary to interact with the text. According to VET (Perfetti, 1985), word recognition becomes more efficient as these reading skills develop and become more automatic. The release of attentional resources allows the working memory the capacity to integrate text propositions and construct meaning.

Other researchers contend that providing suprasegmental features and boundaries allows students to read prosodically and comprehension is improved. Students are able then to chunk groups of words into meaningful units or phrases guided by the syntactic structure of the text. Clay and Imlach’s (1971) classic study of reading prosody reported that children who made shorter and few pauses were amongst the best readers. O’Shea and Sindelar (1983) found similar results. In a study with half of the 48 participants
reading below grade level, they reported that slow readers improved comprehension when the text was segmented by phrases.

It is conceivable that fluent reading of a passage, by chunking sections of the text into meaningful phrases, create more cognitive resources for comprehension functions (Young & Bowers, 1995). The research by Jenkins, et al., (2003) corroborates this hypothesis showing that additional variance in reading comprehension, when isolated words were controlled for, was accounted for through fluent reading of the text. Conversely, empirical studies show that children who cannot chunk words into meaningful phrases experience difficulties in reading comprehension (Clay & Imlach, 1971; Golinkoff, 1975-76).

The question of whether prosodic reading can be an aid to comprehension was directly addressed in a recent study (Schwanenflugel, et al., 2004). They hypothesized that “prosody independently contributes to better reading comprehension above and beyond the contribution of word decoding speed by providing linguistic feedback to the child, which aids comprehension” (p. 127). A spectrograph was used to measure tonal inflections, pauses, and pitch during passage reading of 120 second grade students reading. The results were compared to adult scores who read the same passage. Even though they found that prosody was strongly correlated to individual differences in word reading proficiency, they found negligible support for the hypotheses. Results showed there was only a minimal relationship with reading comprehension once the effect of single-word-reading efficiency was controlled for.
**Prosody as a Product of Comprehension.** The second model emerges from a cognitive perspective wherein prosody is viewed as a result of understanding the text. Riddle Buly and Valencia (2002) in examining profiles of students who fail state reading assessments reported that more than 50% of students in their sample who had strong word identification skills, or who could read words with automaticity, reported that they were unable to read with meaning or with expression. This would substantiate some researchers’ view of reading fluency as a multidimensional and multifaceted, complicated process that not only involves automaticity at the lexical level, but higher levels of comprehension skills that require implementing basic comprehension processes such as microprocesses, integrative, elaborative and macroprocesses that would be founded in Perfetti’s theory of verbal efficiency (1988). It is Perfetti’s premise that during the processes of lexical access and propositional encoding readers must be able to construct high quality representations, and select idea units to be organized and retained in memory, which requires an ability to understand anaphora and connectives. These processes must be learned and practiced to the point of automaticity so that more resources are available for elaborative and metacognitive processes. Therefore, it would be assumed, that the reader’s ability to read with intonation, must be grounded in an understanding of the text in order to parse text into appropriate syntactic phrases (Chafe, 1990; Dowhower, 1991) and is a reflection that proficiency in the lower and higher level processes has been attained. However, Schreiber (1987) found little evidence to support the connection between prosody and microprocessing while examination of other studies report mixed results (Young & Bowers, 1995).
Two studies directly examined the role of prosody as an outcome of reading comprehension in correlational studies (Jenkins, et al., 2003; Schwanflugel, et al. 2004). Schwanflugel, et al., (2004), during the same experiment to examine the hypothesis that prosody is a mediator of comprehension, also tested their hypothesis that reading comprehension is a predictor of prosody. In this hypothesized model both comprehension and decoding speed predict prosody. Once again a strong relationship between decoding speed and reading comprehension emerged but there was no evidence to support a significant relationship between reading comprehension and prosodic variables. Possible justification for lack of significance in both models could be due to inadequate comprehension measures. The passage used in the study was simple and straightforward and could have limiting effects at establishing a relationship due to the fact that highly decodable passages are characteristically easier to read and less interesting than more challenging and demanding passages. Also, prosodic and comprehension measures were not conducted on the same passage.

Their findings on prosody, however, support previous research findings. The results indicate that good readers made short pauses and declarative sentence endings possessed a perceptible pitch variation amongst good readers (Clay & Imlach, 1971; Dowhower, 1987). They also noted that good readers imitate prosodic sentence contours of adults.

Schreiber (1991) affirms the existence of children’s sensitivity to prosodic features in understanding oral language which is of a much greater magnitude than that of adults’ reliance on prosodic cues. Other researchers contend that there is a comparable
dependency on prosodic cues in the understanding written text, as well (Allington, 1983; Dowhower, 1991). Dowhower (1991) reports that children are highly dependent on prosodic features in oral language, which aids in understanding. Researchers believe that this dependence is as important to understanding the meaning of text (Allington, 1983; Dowhower, 1991; Schreiber, 1991). Reading prosodically is indicative of the reader’s ability to segment text according to major syntactic-semantic elements (Kuhn & Stahl, 2003). Prosody is a compilation of spoken language features which are not graphically represented in printed text to guide syntactic meanings. Therefore, reading is more difficult to understand than speech. When individuals read prosodically, they are not merely reading with speed and accuracy; it is indicative that they have an understanding of the meaning of the text and are able to apply the subcomponents of the microprocesses of basic comprehension processes by chunking words into meaningful phrases. “Prosodic features involve variations pitch (intonation), stress (loudness), and duration (timing). When these suprasegmental features are present in fluent reading, the term prosodic reading is applied” (Dowhower, 1991, p. 2).

Chafe (1988) believes that in order to read a sentence with prosody a reader must be able to understand the semantic and syntactic complexities of the sentence. However, Dowhower states that the relationship between prosody and reading comprehension is unclear and some researchers found little relationship between reading with expression and comprehension (Karlin, 1985; Snow & Coots, 1981). Schwanenflugel et al. (2004) found little evidence to support Chafe’s (1990) claim.
Another reason to explain the existence of two models of prosodic reading and reading comprehension lies in the difficulty for empirical validation from standardized measures. Prosodic reading means reading aloud with expression or in a manner that imitates oral language and most researchers find this component of fluency difficult to study and measure (Wolf & Katzir-Cohen, 2001). Assessment tools, which cannot directly measure prosody (Schwanenflugel, et al., 2005) consist of rating scales or checklists such as the four-level scale developed for the 1992 National Assessment of Educational Progress in reading (Daane, Campbell, Grigg, Goodman, & Oranje, 2005) or the checklist developed by Hudson, Lane and Pullen (2005, p. 707). Therefore, measuring the quality of prosody is a subjective task.

The NRP (2000) reiterates the fact that comprehension is enhanced when fluency permits cognitive resources to be available for interpretation, but the report also claims that comprehension is required in order to be able to interpret expressively what is being read. However, none of the research studies were able to provide empirical evidence to substantiate the latter part of this statement.

Summary

Much of the research on reading fluency and reading comprehension is focused on instructional practices to improve rate and speed of word identification skills. Most of these interventions have been successful in reporting gains in speed and accuracy, but there are inconclusive results regarding improvement in reading comprehension. Therefore, it could be argued that the relationship between ORF and reading comprehension entails more than just training children to read words faster.
Research states that there exists a reciprocal, facilitative connection between prosodic reading and comprehension. There are two views which relate to the role of prosody in reading comprehension. One school of thought purports that if children read with expression it helps them understand what they are reading. A second school of thought purports that prosody indicates that the reader understands what is being read. Prosody, as demonstrated in speech, gives proper expression which aids the listener to comprehend, but, whether or not the reader listens to his or her own prosody as an aid to reading comprehension has yet to be determined. It is unclear which model is accurate because there is a scarcity of research due to the difficulty in measuring the construct of prosody.

Characteristics of Good and Poor Readers

Unquestionably, proficiency in expressive and fluent reading will be affected by individual differences in reading ability. Expert readers manifest specific characteristics that are lacking in students who struggle with reading (Pearson, Roehler, Dole, & Duffy, 1992). Most poor readers often inordinately depend on one strategy for all reading challenges, while neglecting other, more appropriate strategies (Sulzby, 1985). Due to the fact that less fluent readers primarily expend their energy on decoding of individual words (Armbruster, Lehr, & Osborn, 2001), they are less able to make the connections among the ideas in the text, which prohibits them from employing strategic and self-regulatory approaches (Pressley & Afflerbach, 1995). Before students are able to monitor and evaluate their own comprehension as tools for literacy instruction (Biancarosa & Snow, 2006), they must be able to master the skills involved in list and context fluency.
“A hallmark of skillful readers is the speed and relative effortlessness with which they typically progress through the words of written text”, (Adams, 1990). She further contends that when readers are skilled in fluency they are able to encode entire phrases and sentences at once due to the efficiency in word recognition processes. Skillful readers are then able to focus attention on gaining meaning from the passage. This ability to effectively attain proficiency in word processing, which in turn leads to phrase and sentence encoding, will ultimately affect the rate and accuracy of reading words.

**Oral Reading Fluency Measurement Tools**

One of the challenges in examining ORF arises over the conflicting views of fluency in skilled reading. Strecker, et al., (1998) stress the difficulty of examining the construct of fluency when a consensus of that construct does not exist. Regardless, there are different measures to assess ORF which can involve utilizing isolated word lists or text and under silent or oral reading conditions. Since the speed of reading words in context has been empirically established to have a direct bearing on reading comprehension (Torgesen, Wagner, & Rashotte, 1997), Deno (1985) established a means of timed, repeated measurement of reading words correctly in context, known as curriculum-based measurement (CBM)

1. Typically, ORF is assessed with the technique of curriculum based measures. Since accuracy, rate and prosody are the three indicators

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1 Note: since CBM can refer to an index in academic growth in reading, mathematics, writing and spelling (Deno, 1985), CBM in this study refers to a tool for the measurement of academic growth in oral reading fluency. Recent research has differentiated this with the abbreviation of CBM-R and will be applied in this study.
of ORF, it is necessary to operationalize each of these three components in order to measure fluency.

Curriculum Based Measurement

Reading is an extremely complex process that requires degrees of cognitive multitasking. Yet, simply by listening to an individual read a passage orally, it is possible to attain a reliable and valid measurement of reading competence (Jenkins, Zumeta, Dupree, & Johnson, 2005). Deno (1985) found that the number of words read correctly in one minute from either isolated word lists or text passages produced a high correlation not only to standardized word-recognition subtests, but was also highly correlated with comprehension performance results with a .78 correlation on the Literal subtest of the Stanford Achievement Test and .80 correlation on the Inferential subtest. Concurrent validity of CBM-R with respect to subtests of the Woodcock Reading Mastery Tests has been documented between .89 and .92 (Fuchs, 1981 as cited in Fuchs, Fuchs & Maxwell, 1988). More recently, McGlinchey and Hixson (2004) investigated the correlation and predictive value of CBM-R procedures on a state-wide standardized fourth grade reading state-wide exam scores and reading rate was .67. In a similar study, these results are higher than those recorded by Stage and Jacobsen (2001), but not as high as Fuchs (1981), who documented a concurrent validity with respect to subtests of the Woodcock Reading Mastery Tests between .89 and .92. Using CBM-R places a numerical value on reading rate which allows one to determine the level of automaticity. Parker, Hasbrouck, and Tindal (1992) reported that measures of ORF are good indicators of reading comprehension. Deno et al. (1982) reported correlation coefficients that ranged from .73-
.91 on five different measures that could be used to monitor reading progress when correlated with published norm-referenced tests. One of these measures consisted of a one minute reading of a passage from the curriculum basal reader.

Other research has substantiated the technical adequacy of CBM-R and found it to be a reliable and valid indictor and predictor of performance achievement (Deno, Mirking & Chiang, 1982; Fuchs, Fuchs, & Deno, 1982; Fuchs, Fuchs, & Maxwell, 1988; Shinn, 1989; Shinn et al., 1992). CBM procedures’ test-retest reliability has been shown to range from .93 to .96 (Fuchs, Deno, & Marston, 1983).

However, in a current study, Christ and Silbergliitt (2007) challenge the precision of the psychometric properties of CBM-R when their research assembled estimates for the standard error of measurement (SEM) for CBM of ORF. Christ and Silbergliitt (2007) collected CBM-R data from 8,200 first- through fifth grade students for eight years. They reported that the median estimate of SEM across grades and conditions was 10 words read correctly per minute (WRCM) with a range of 4-15. It is important to note, though, that the authors acknowledge that CMB outcomes are affected by instructional effects and testing conditions. For example when CBM-R is administered under well-controlled conditions, controlling for noise and distractions, the SEM might approximate 6 WRCM for the median performance when three passages are administered to a second grade peer group. Another limitation of their study includes the fact that these researchers used only two probe sets instead of three. Also, the generalizability of the their study is questionable because, even though the n was considered to be high, the population was taken from five school districts in only one region of the country. The authors also, concede that it is only
under rare conditions the extreme value of 15 WRCP would ensue. Other researchers (Howe & Shinn, 2002; Marston, 1989) on reliability of CBM-R, such as test-retest, alternate-form, and interrater reliability, supported the use of CBM-R.

**Accuracy.** Accuracy is the percentage of words read correctly. The most common method used in assessing accuracy and rate (reading fluency by many definitions) is to have students orally read a passage at grade level for one minute. Studies have shown that reading of one passage provides a reliable assessment of fluency in the low .90’s while the median of reading orally three passages has a reliability between .95-.99 (Torgesen, 2005). During the reading, deviations from print are recorded. Deviations are classified as omissions, insertions, repetitions, mispronunciations, silent pauses longer than 5 seconds and attempts longer than 10 seconds. Self-corrections, in which students accurately or inaccurately self-correct, and repetitions, will not be counted as errors, but indirectly, a penalty is still enforced. Since these errors consume time, which limits the number of words that a student can read correctly, they will inevitably impact the final score (Shinn, 1989).

**Prosody**

As previously stated, one difficulty researchers have encountered in attempting to validate models of prosody and comprehension is that testing theoretical models empirically from standardized measures is problematic. Prosodic reading means reading aloud with expression or in a manner that imitates oral language and most researchers find this component of fluency difficult to study and measure (Wolf & Katzir-Cohen, 2001). Assessment tools, which cannot directly measure prosody, consist of descriptive
rating scales or check lists, such as the six point scale developed by Allington (1983) or the four-level scale developed for the 1992 National Assessment of Educational Progress (NAEP) in reading (Daane, Campbell, Grigg, Goodman, & Oranje, 2005) or the checklist created by Hudson, et al. (2005, p. 707). Therefore, measuring the quality of prosody, using one of the above rubrics or scales, is a subjective task (Schwanenflugel, et al., 2004). However, listening to a child read a grade level passage and then using a rubric that scores the elements of expression, volume, phrasing, smoothness and pace is an effective and efficient method of assessing prosodic reading (Rasinski, 2004).

Summary

Many researchers support the premise that one of the qualifying elements to gain meaning from the written text is dependent on fluent reading. Therefore, fluency measurement is crucial aspect. However, there are very few fluency measures. The most common is a technique called curriculum-based measurement which was initially developed as a measure of reading growth, but is often used in research to operationalize the constructs of reading fluency (Fuchs et al., 2001). CBM measures the reading rate. Measuring prosody is even more problematic. The most common method is the use of a scale such as the one used by the NAEP in their 1992 and 2002 national studies of fourth graders oral reading fluency.

Instructional Techniques to Improve Oral Reading Fluency

Even though an intervention will not be conducted in this research design, this study incorporates conditions based on the theoretical foundations of four extensively researched instructional interventions that have been empirically validated for the
effectiveness in improving reading fluency. These include Repeated Reading (RR) (Samuels, 1979; Kuhn, 2004; NRP, 2000), modeling, (Rasinski, 2003), previewing, which can include previewing of words (Skinner & Shapiro, 1989; McCallulm, Skinner, & Hutchins, 2004) and passage previewing (Mathes, Simmons, & Davis, 1992; Rose, 1984; Skinner & Shapiro, 1989) and finally, text-signalling devices (Lorch, 1989; Lorch & Lorch, 1986). This section will highlight this literature to justify their validity in this research.

Repeated Reading Techniques

Repeated Reading (RR) was identified by the NRP (2000) as one of two effective strategies to have a significant impact on word recognition, fluency and comprehension. They reported that RR can improve reading of nondisabled students (Bryant, Vaughn, Linan-Thompson, Ugel, Hamff, & Hougen, 2000; O’Shea, Sindelar, & O’Shea, 1985; Rasinski, Padak, Linek & Sturtevant, 1994) as well as students who are classified with LD (Bryant et al., 2000; Flood, Lapp & Fisher, 2005; Mathes & Fuchs, 1993; Mercer, Campbell, Miller, Mercer, & Lane, 2000; O’Shea, Sindelar, & O’Shea, 1987; Rashotte & Torgesen, 1985; Sindelar, Monda & O’Shea, 1990; Vaughn, Chard, Bryant, Coleman, & Kouzekanani, 2000). Given that the panel reported on 14 repeated reading studies with differences in subject characteristics (age, reading level, etc) as well as differences in treatment, only basic measures of effect sizes for rereading could be reported. These include word recognition (.55), fluency (.44) and comprehension (.35). Repeated Reading is the most universally implemented technique used to remediate struggling readers to enable them to achieve skills in reading (Samuels, 1997) and has been regarded to be a
“deceptively simple but extraordinary powerful” means of improving word recognition efficiency (Dowhower, 1994, p. 343).

RR is a technique developed by Samuels (1979) and Dahl (1979) as a means to build automatic word identification skills in beginning readers of English. It is based on the theory that multiple rereading of a text will develop automaticity at the decoding level (La Berge & Samuels, 1974). There are basic assumptions that must be met in order for this strategy to be effective. One is that the reader must be able to decode words accurately. It is through practice that processing speed will increase to the level of automaticity. RR incorporates two fluency components: rate and accuracy. It requires students rereading a meaningful passage aloud or silently until they are able to read it effortlessly, or fluently, through automatic word recognition in which reading speed is emphasized over accuracy of word recognition. Once the passage has been mastered by attaining the criterion rate of age and grade level number of words per minute, then the same procedure is followed with a new passage. Passages, selected at the students’ independent reading level, consist of 50-200 words. A less structured adaptation of RR simply requires students to read the passage more than once (Hale, Skinner, Winn, Oliver, Allin, & Malloy, 2005).

The RR strategy can be done using assisted or unassisted methods. The assisted method involves the student orally reading to the teacher who supplies any unknown word(s). In 1976, Chomsky developed a technique for assisted RR using audiotapes. Children read the story in print while simultaneously listening to the story on tape. Even though she reported that participants increased in both rate and accuracy, there was a lack
of empirical data to support these claims. Dowhower (1987) did not report similar findings when she used an audio tape as an assisted technique. A group of grade two students listened to the tape and then rehearsed the story aloud until a target of 100 WPM was attained. Dowhower reported no significant difference when this group was compared to the control group that practiced the same story by reading it aloud on their own with no assistance. Both groups made similar progress.

Research has demonstrated robust empirical evidence that RR has been effective in increasing reading rate and accuracy (Carver & Hoffman, 1981; Dowhower, 1987, 1989; Kuhn, 2004, 2005; Rasinski, 1990; Skinner, Adamson, Woodward, Jackson, Atchison, & Mims, 1993), regardless of implementing assisted or unassisted procedures. However, studies reporting on gains in reading comprehension produced mixed results. Many studies report little to no improvement in reading comprehension (Bryant et al., 2000; Levy, Abello & Lysynchuk, 1997; Mathes & Fuchs, 1993; Rashotte & Torgesen, 1985; Vaughn, et al., 2000). In a crossed research design, Dahl (1979) compared three methods to determine the effect on fluent reading on 32 second grade students struggling with reading. These included 1) the use of context to predict unknown words, 2) sight word reading and 3) repeated reading. Results showed that context-based training and rereading were equally efficient in enhancing reading accuracy, but repeated reading also improved reading speed. The sight word training produced no significant effects. She reported that there were effects for micro-level comprehension but not for more general comprehension measures. Carver and Hoffman’s (1981) report similar results. They conducted a rigorous study using programmed text and a computer. After training, they
reported significant increases in rate and accuracy but, after administering five standardized reading tests, they found gains in comprehension on only one test.

Yet, other studies document gains in reading comprehension with the use of RR (Herman, 1985; Dowhower, 1987). Dowhower, in a comprehensive study using assisted and unassisted repeated reading to investigate transfer effects on speed, accuracy, prosody and comprehension reported gains in all areas. Not only did she report gains in accuracy, rate and comprehension but also gains transferred to unpractised, similar passages with participants in both groups.

Reviews of the literature found RR improved reading fluency and comprehension for both nondisabled students and students categorized as learning disabled (Flood, Lapp, & Fisher, 2005; Meyer & Felton, 1999). Additionally, Dowhower (1994) and Sindelar, Monda, and O’Shea (1990) reported that gains in fluency and comprehension through RR of practiced passages transferred to unpractised, similar passages for both at-risk students and not at risk students in grades three through five.

Kuhn and Stahl (2003) identified 58 studies that used RR reading to improve reading fluency and comprehension. Of these 33 were unassisted and 15 implemented assisted procedures. Since most of these studies were designed as clinical methods to assist students struggling with reading, only 40% have a control group. They reported effects of repeated reading on fluency and comprehension on the 15 studies that used a control group. Most studies stipulated a specified number of times that the passage would be read as opposed to utilizing the criterion of reading the passage fluently as recommended by Samuels (1979). The majority stipulated three readings. Studies on
repeated readings showed no advantage over either procedure. With few exceptions (Carver & Hoffman, 1981; Dahl, 1979) they found that there was an increase in comprehension whenever there was an increase in fluency.

Interestingly, Therrien (2004) detected that how students were cued for repeated reading affected the result, especially for LD students. Some studies directed students to read for comprehension while others cued for speed. O’Shea, Sindelar, and O’Shea (1985, 1987) made a comparison of cuing for comprehension and cuing for fluency. They found that nondisabled readers were able to adapt their reading style to the provided cue; however students with LD who were instructed to read for comprehension remembered more than LD students who were instructed to read as fast as possible. The students cued for comprehension also read as fast as those students cued for speed.

It is important to note that RR is acclaimed as a successful strategy for improving reading fluency and reading comprehension. It simultaneously targets all of the components of ORF so several theories can account for the success of RR to improve ORF and/or reading comprehension. Students are presented with multiple opportunities to practice the text. This increases the level of automaticity in word recognition and accuracy (La Berge & Samuels, 1974). The reader, through extensive exposure to the printed text, is able to recognize the syntactic phrasing to help gain sense from the passage (Logan, 1988; Perfetti, 1985; Schriber, 1980) which aids comprehension and the possible stimulation of the spreading activation of words for prepositional encoding (Posner & Synder, 1975). Assisted RR provides the reader with a model of fluent reading which aids in prosody (Schrieber, 1980). Because of RR’s multitasking efficiency, it is
not possible to analyze the impact of a single ORF component on reading comprehension. Conversely, the effect of reading comprehension on a single component of ORF cannot be investigated.

**Previewing**

Previewing is an assisted mode of repeated reading and is considered any method in which the reader is granted access to text material, whether through reading or listening prior to formal instruction or testing of the passage (Rose, 1984) as a means to improve accuracy, automatic and prosody. It also facilitates understanding of the text. There are various types of previewing techniques to enhance fluency. The various forms of this technique can include students previewing the text aloud (oral previewing), silently (silent previewing) or by listening to a fluent reader model the material (listening previewing).

*Listening Passage Previewing.* Hollingsworth (1970; 1978) designed an intervention establishing the origin of reading-while-listening strategy. This intervention included 20 fourth, fifth and sixth grade students, who were identified as struggling readers. Half were randomly assigned to a control group and half were assigned to an assisted reading condition where they would simultaneously listen to a taped recording of a text that was designed to model Heckelman’s (1969) neurological impress method. The experimental group made a year’s growth during the semester while the control group made only .04 year’s growth.

Both Rasinski (1990) and Dowhower (1987) compared repeated reading and listening-while-reading. Dowhower, (1987), using a time series design worked with 18
second grade children who were identified to be at Chall’s (1993) stage 1 developmental phase and used both listening-while-reading and unassisted repeated readings to determine the transfer effects on speed, accuracy, prosody and comprehension. All participants were word by word readers with a reading rate below 50 words per minute. The randomly assigned students to the listening-while-reading condition were presented with a tape-recorded model while the unassisted condition worked independently with the option to request assistance for unknown words. She reported measures on both practiced and unpractised passages which consisted of six basal stories at grade 2 level. These stories were rewritten to maximize equivalency. She found that all participants made progress in prosody. However, the assisted group, who had a tape recorded model of the story, made greater improvements on all prosody measures. Both groups demonstrated equal improvement in speed and accuracy and comprehension. Interestingly, the prosodic modeling did not enhance meaning to assist with reading comprehension.

Rasinski (1990), in comparing RR and listening-while-reading to fluency growth (reading speed and word recognition accuracy) with 20 third grade students found results similar to Dowhower. He reported that listening passage previewing to be just as effective in increasing rate and accuracy as RR, while being less time consuming and easier to implement. Rasinski contends that listening-while-reading offers a fluent rendition of the text so that students read at a faster pace and with expression from the first reading as opposed to a slow and halting manner that initiates most repeated readings.
Further research documents the effectiveness of increasing ORF by listening to a passage (Daly & Martens, 1994; Rose, 1984). Rose found listening previewing over silent previewing to substantially increase performance on oral reading tasks with six students classified as LD using an alternating treatments design. Later research documented similar results comparing the effects of teacher-directed and taped previewing of four students classified as LD (Rose & Sherry 1984). Similar results were reported by Rose and Beatty (1986) and Rousseau and Tam (1993). This could be a result of combining both listening and reading. This increases comprehension because the student can expend less cognitive energy decoding words, leaving greater cognitive focus on text interpretation. Daly and Martens (1994) incorporated three different previewing conditions in their study of four elementary students with LD. These included listening previewing, taped words previewing and silent previewing. The listening previewing reported larger performance gains than the other two on oral reading rate, but also was the only previewing condition to document an increase in reading accuracy. In another study, Salend and Nowak (1988) investigated the effects of a peer previewing procedure on the reading rate and accuracy of three elementary school students with LD. Peer previewing proved to be effective as there was a decrease in word recognition errors and an increase in reading speed.

Daly and Martens (1994) in a single-subjects design, used a listening previewing technique and reported two participants doubled the mean of ORF and listening previewing led to the greatest gains in ORF over baseline. These results are consistent
with other research (Rose 1984) that reports listening passage previewing produces more gains than no previewing and silent passage previewing.

So overall, the research has shown that listening to a passage prior to reading an assigned text, produced not only gains in ORF, but gains in reading comprehension as well.

*Word Previewing.* Fuchs, Fuchs, Hosp, & Jenkins (2001) describe ORF as a “direct measure of phonological segmentation and recoding as well as rapid word recognition” (p.239). The ability to read words is strongly correlated with reading comprehension and is essential for ORF (Gough, 1996; Schwanenflugel, et al., 2004). Additionally, fast word recognition is a key factor of the bottleneck theory. The inability to apply immediate word recognition to text blocks the channel to automaticity, resulting in interference with comprehension (LaBerge & Samuels, 1974) particularly among elementary school children (Perfetti, 1985). VET (1985, 1992) demonstrates that immediate word recognition response is essential in order to gain meaning from text.

Word previewing to measure ORF can be measured using one of two tasks. These include presenting words in or out of context. Context-free word recognition prohibits the use of comprehension influences to aid identification of words and validates the verbal efficiency theory when words are measured on isolated word task (McCormick & Samuels, 1979; Perfetti & Hogaboam, 1985). The second method that has been proven successful for measuring ORF is measuring words in context (Deno, et al., 1982; Fuchs, et al., 2001). However, Dahl (1974) did not report similar results. When they trained students in rapid word identification there was no improvement in fluency or reading
comprehension in the passages that contained the targeted words. Similar results were reported by Dahl and Samuels (1977) and Fleisher, Jenkins, & Pany (1979). Knowledge of word recognition is a requirement of ORF; however, it is not sufficient as other factors not only influence fluency but are prerequisites as well (Eldredge, 2005; NRP, 2000).

A recent research study by Eldredge (2005) attempted to identify the foundational knowledge and skills needed for reading fluency by examining correlations and causal relationships of first, second and third grade students’ growth on potential precursors of fluency: phonics, word recognition and fluent reading. Students were tested in each area twice during the year. Word recognition measures consisted of running records in which the number of words read correctly were recorded and four word recognition tests. Each of these four tests contained a list of 30 words. The first list was comprised of high frequency, regular graphophonic words. The second contained high frequency, irregular graphophonic words; the third contained low-frequency, regular graphophonic words and the fourth test contained low-frequency irregular graphophonic words. Fluency measures were timed and taped running measures to assess fluent reading and the fluent word recognition was measured by taping and timing students as they read the word recognition list. Findings indicated that first and second grade students made growth in fluency. However, it was reported that the third graders showed no growth in fluency as indicated by the running record fluency mean scores. Interestingly, the third grade scores on the word recognition fluency showed growth in reading speed and accuracy indicating that words in isolation had greater fluency than words in context. Results of this study showed phonetic ability to decode influenced efficiency in word recognition. Word
recognition leads to increased rate of reading and accuracy growth. The researchers assert that their data support the theoretical model that fluency facilitates comprehension.

Many studies that targeted faster reading of words in a list (Fleisher, Jenkins, & Pany, 1979; Levy, Abello, & Lysynchuk, 1997; Spring, Blunden, & Gatheral, 1981) produced significant results for increased speed and accuracy of reading, even though there was no statistically significant effect for reading comprehension. Dahl (1979) did not report similar findings. In a study where second grade students practiced sight words in isolation, she reported there was no effect on either speed or accuracy. However, the different findings could be a result of the selected targeted words. For example, Levy, et al., targeted 72 words from each of the stories whereas Dahl targeted 800 function words.

Although there is some benefit to isolated word recognition study, the report of NRP (2000) indicates that this strategy may lack transferability when practiced words are presented in a meaningful context. Even though there is controversy of whether context or context-free words better facilitate skilled or unskilled readers, this topic is beyond the scope of this literature review; both approaches have been validated in the literature to be reliable measures in comparing the efficacy of techniques employed to improve reading proficiency (Jenkins, et al. 2003).

**Auditory Modeling of Fluent Reading**

One outcome of listening previewing is the added benefit of a rate building activity through prosodic modeling. The fluent rendition furnishes a “rich model of the phrasal organization of written text which otherwise contains few reliable cues guiding its segmentation into meaningful units” (Snow, Coots, & Smith, 1982, p. 20) before students
read the text themselves. Children need to hear what fluent reading sounds like before they can be expected to demonstrate fluent reading (Clark, 1995; Rasinski, 2003). Rasinski claims that modeling fluent reading increases word recognition and comprehension. Schreiber (1980) contends that the beginning reader must appropriate signals in written text, such as punctuation and inflectional endings, to compensate for the lack of prosodic cues in order to group words into syntactic phrases. Perfetti (1985) stresses the importance of automatic propositional encoding so propositional integration can occur. By listening to good models of fluent reading a less skilled reader learns how a reader’s voice can help written text make sense (Armbruster, Lehr, & Osborn, 2001, p. 26) by mapping prosodic speech patterns to syntactic structures in print.

In Dowhower’s (1987) study to determine the effectiveness of RR and listening-while-reading on measures of rate, accuracy, comprehension and prosody, it was her intent for the participants in the assisted reading to listen to the taped passages until their oral reading was “fluid, flowing, and facile”, p. 390 using the modeled rendition to give the reader a sense of expressive reading. The students in the listening-while-reading group were to practice with the tape until they were comfortable with their reading. Once this level of comfort was attained they practiced on their own. A microcomputer assessed determined students prosody on the six markers that Dowhower identified that comprised expressive reading. Both groups made gains on the prosodic measures but the participants in the group who read along with the tape significantly improved their intonation across readings and demonstrated expressive reading using more appropriate phrasing with less pausal intrusions than the group who practiced independently.
Previewing is reported to be as successful as RR in increasing oral reading rates and accuracy as well as comprehension. Like RR, this strategy works to target all of the components of reading fluency. Previewing aids comprehension and primes the vocabulary that will be met during the reading of the passage. Prosodic reading in a listening previewing aids in understanding of the passage prior to the second reading. Hale, et al. (2005) suggest that since the reader does not have to use cognitive resources to decode the text, more attention can be applied to gaining meaning from the text. Also, when previewing supplies a model of prosodic reading, Schrieber (1980) would contend that “we would predict that if the child hears a fluent reader produce the appropriate phrasing of the sentences in the passage, he will have less difficulty imposing such phrasing himself and will recognize more easily the character of the task.” Therefore, as with RR, this strategy targets more than one skill, so it is unclear as to which mechanisms are impacting ORF.

**Comprehension Priming**

Reading is a selective process. Research has demonstrated that text signalling devices, or organizational signals, affect readers’ attention, reading process, comprehension, memory and selective access (Lorch, 1989). Most studies focus on expository text (Kardesh & Kent-Noel, 2000; Lorch, 1989; Lorch, Lorch, & Inman, 1993; Mayer, 1984; Mayer, et al., 1996; Potelle & Rouet, 2003; Sanchez, Lorch & Lorch, 2001) and report mixed findings depending on the structural cue and reader ability. Signalling devices can take the form of visual signals, lexical, semantic or text formatting. They can include headings, chapter breaks, colour fonts and overviews or summaries such as those
found in expository textbooks to help readers identify and remember the main points. According to Lorch (1989) different types of signals devices provide the reader with different information.

One experimental condition in this study will involve the student listening to a summary prior to reading the passage. Very little research exists that examines the effectiveness of presenting an oral summary prior to students reading the content. Most studies focus on written summaries as an advance organizer or a measurement of comprehension after reading. Summaries have been used as text signalling devices for decades in elementary, secondary and tertiary education as a precursor to highlight upcoming information or for purposes of remembering and retrieving presented information. The act of summarizing requires the ability to detect superordinate details over subordinate ideas. A summary of a narrative text is a condensed account or a conceptualized mental representation of the content of text, however:

“… nothing is known at this point about the long term benefits of summarization training. Nonetheless, the evidence to date in favour of this strategy as a facilitator of comprehension and memory is so striking that we recommend the procedure without hesitation” (p.9, Loyd & Steele, 1986)

A potential effect of a summary is the impact on the readers’ ultimate comprehension of information due to changes in the salience of a passage’s structure since readers encounter superordinate content before they actually read the text. Recall of superordinate content permits retrieval of subordinate details (Lorch, Lorch, & Inman, 1993). León (1997) argues that a summary helps the reader to ‘form a core concept which represents a general vision of the text” (p. 86). This core concept creates an
understanding of the text to the macrostructure level. This view is supported theoretically through the macrostructural processing model of Kintsch and van Dijk (1978). The summary acts on the memory to create a retrieval system because the summary creates a concise and organized mental representation of the written text. Research has demonstrated a relationship between memory and hierarchical structures of information (Kintsch & Keenan, 1973) such that essential information is recalled more than unessential information (Gomulicki, 1956) and propositions are more easily recognized.

Furthermore, simply by being presented with a title of a narrative text, students were able to produce superior recall of stories than those who were not given the title (Dooling & Lachman, 1971; Zhang & Hoosain, 2001). This connection to fluency is made evident in the study by Wiley and Rayner (2000). They found that students who were presented with titles on passages, produced not only better recall of the passage, but the presence of a title produced faster word reading. Also, Zhang and Hoosain (2001) conducted two separate experiments with graduate students whose native language was Chinese. They were randomly assigned to one of three groups to read 18 to 20 short, narrative texts with different combinations of titling. Interestingly, they reported that not only did the title of narrative texts facilitate global information through the development of individual schema but the reading times of the participants were shorter in the passage that contained a title over the passage with no title. These results were contrary to findings reported by Lorch and Lorch (1986) who signalled an upcoming summary passage in text to be read. These summary cues pointed to information that summarized details that were critical to the conceptual structure of the text. The participants decreased
their reading speed when there was a summary signal. Better readers were not as affected as much as poorer readers in change of reading speed.

**Summary**

Two of the most common and successful instructional methods designed to promote fluency development are repeated reading and previewing. Simply by using a single strategy, all components of reading fluency are targeted. These interventions have been designed to improve accuracy, automaticity, prosody and comprehension concurrently. This is ideal for a struggling reader desiring to make gains in reading fluency and reading comprehension. However, these multitasking interventions prohibit any examination of how one construct affects another, if at all. Therefore, very little is known about the individual components of ORF and the relationship between reading comprehension.

Comprehension priming strategies such as text signalling devices, including titles and summaries have been shown to provide an effective overview to facilitate the comprehension of a text. Most research, however, addresses written or oral summaries as a means of determining comprehension proficiency of the content after reading of the text. Summaries can help the reader integrate the information to extend comprehension beyond the text level into a deeper, situational level (Kintsch, 1988).

**Isolating Components of Oral Reading Fluency**

Presently, the controversy surrounding ORF pertains, not to the existence of a relationship between ORF and reading comprehension but the direction of the effects of one on the other. Most research investigations have focused on two or three elements of
ORF simultaneously (Fuchs, et al., 2001; Jenkins et al., 2003; Young & Bowers, 1995).

In order to investigate the directionality it is necessary to isolate each component of reading fluency to determine the exact nature of the relationship with reading comprehension because accuracy, automaticity and prosody exert their individual influence on comprehension and/or comprehension affects each in a different way. This study attempted to estimate the effect of each component of ORF, speed, accuracy and prosody, by isolating each in one of the four experimental conditions.

Each condition isolated constructs that have been demonstrated to have an impact on ORF, e.g., comprehension priming, lexical priming and prosodic modeling. The theoretical foundations and research knowledge rendered in this literature review gave direction to the conditions manipulated in this study. Each contributor to fluency has been methodically appropriated to investigate its effect on ORF.
CHAPTER 3

METHODOLOGY

Participants

The participants in this study consisted of second grade students attending two schools in an urban school district in Southeastern Florida. These schools are located in one of the largest school systems in the nation within a district that has the largest minority public school system in the country with 60% of its students being of Hispanic origin, 28% African American and less than 3% non-white of other minorities. The district’s Limited English Proficiency (LEP) population is composed of ninety-four languages with Spanish (85%), Haitian/Creole (12%) and Portuguese (1%) being the top three (Miami-Dade Public Schools, 2006).

According to U.S. Census Bureau, 2006, 71.1% of the population speaks a language other than English with the majority of the population in the district reporting Spanish as the first language of 59.2% and English, 32.1% as the second language. The median income for a household in the county was $41,237, and the median income for a family was $46,731. Approximately 14.5% of families and 18.0% of the population were below the poverty line, including 22.9% of those under age 18 (U.S. Census Bureau, 2000, Summary File 3, Miami-Dade County Department of Planning and Zoning, Research Section, 2003). In regard to educational attainment 27.0% of the population of Miami-Dade County are high school graduates or have high school equivalency, 15.8% report leaving college with a Bachelor’s degree and 9.4% have graduate degrees. These figures are slightly lower than national averages which are 29.6%, 17.2% and 10.0%
respectively (U.S. Census Bureau, American Fact Finder, S1501 2006 American Community Survey, 2006).

To comply with the regulations of the No Child Left Behind Act (NCLB, 2001) schools are awarded a rating of A through F primarily based on student performance on the Florida Comprehensive Assessment Test (FCAT) with Grade A signifying the highest performance rating and grade F indicating a failed rating. Even though in the 2004-05 school year, 65 out of the 67 school districts in Florida did not meet the federal adequate yearly progress criteria due to the fact that they did not meet the progress on all 39 indicators (see Florida Department of Education website: www.fldoe.org), the schools selected for this study were awarded district school grades of A in accordance with the guidelines for the state: Florida A-Plus Accountability Plan.

**Sampling Procedures.** For this study, schools with a population of more than 100 grade two students and a population of less than 20 % of LEP students, as well as schools within reasonable proximity to the university were selected. Out of the 195 elementary schools in the district, five schools met these criteria. Of these schools, I petitioned all five elementary schools to host this study. Two principals assented to the study being conducted in their schools. Table 2 depicts school and district characteristics as posted on the official information web page of Miami-Dade County Public Schools.

School A: The student body in this school encompasses 845 students with 50 instructional staff members. A total of 193 students have been identified with an exceptionality, with gifted (177), speech impaired (8) and specific learning disability (4)
and being the top three. Approximately 0.4% is classified as LEP. A total of 39.6% of the students qualified for free and reduced lunch.

School B: The student body in this school encompasses 586 students with 44 instructional staff members, including one principal, a vice principal, a guidance counsellor and librarian. A total of 158 students have been identified with an exceptionality, with specific learning disability (49), gifted (43), physically impaired (28) and developmentally delayed (21) being the top four. Approximately 15.2% are classified as LEP. Twenty-three percent of the students qualified for free and reduced lunch. The district average was 72%.

\textit{Demographics of Participating Students}

\textit{Gender}. There were 181 students in the total sample, with 124 in School A and 58 in School B. The distribution between both schools revealed 85 males (47.0%) and 96 females (53.0%).

\textit{Age}. The mean age of the sample was 7.74 and standard deviation of .392. In School A the mean age was 7.68 with a standard deviation of .364, while School B had a mean age of 7.86 and a standard deviation of .425.

\textit{Ethnicity}. There were 69 African American (38.1%), 56 Hispanic, (30.9%) 35 Caucasian (19.3%), 11 other (6.1%), and 10 mixed (5.5%). However, the schools were dissimilar in terms of ethnic distribution, not only from each other, but also from the district’s demographics, as indicated in Table 2.
Materials

The materials that were utilized included stopwatches, digital tape recorders and a CD player. To tape participant responses, the Olympus Digital Voice Recorder, DS-30 was used because it is voice sensitive and has superior sound quality. The built in microphone is more sensitive to picking up low audio. The passages for the listening preview were digitally recorded and transferred to a CD. These were played on the Sony Walkman D-NEO50 which had the capacity to play CD-R/RW as well as prerecorded CDs. External headphones were used to ensure student privacy while listening to the passage.

Performance was timed using digital countdown stop watches. Times were corroborated on the digital tape recorder as well.

Probes were three narrative passages selected from those developed by Houghton Mifflin (2001) which are developmentally sequenced by grade level and increase in difficulty but maintain relatively equal length (from approximately 276– 296 words.) Passages were typed, double-spaced in 15-point type.

Instrumentation

Covariate Measure

The covariate measure was student performance on the STAR-Reading percentile scores. This was the only available measure that was implemented in both schools that could be used as a measure of reading achievement. At the time of my study, the data collection for DIBELS had not been complete. The STAR-R (Version 2.2, 1996-2002), published by Renaissance Learning Inc, is an individually administered computer-
adaptive reading test and data base allowing teachers to assess students’ reading abilities in a classroom setting for grades 1-12. The primary goals of STAR-R are to provide teachers with estimates of students’ instructional reading levels, place reading level estimates relative to national norms, and to provide a metric of growth in reading ability across an academic year (Nebelsick-Gullet, 2003). Reports indicate that this test was normed using a sample of 29,627 students with norming data rated by the four general regions of the United States, type of school system, ethnicity and socio-economic status at all grade levels.

It was reported that analysis of norming data by ethnicity and gender showed slightly higher scores for females and a tendency for minority students to score .5 - 1 standard deviation lower than non-minority students. Test-retest reliability estimates were reported for alternate forms for two studies with a 2,000 student sample size with coefficient estimate ranges from .79 to .91 across grade levels with an overall coefficient value of .95. Construct validity was computed through tests of correlations between a variety of other reading measures using the STAR-R test performance and student scores from standardized tests, including the California Achievement Test, Comprehensive Test of Basic skills, Explore, Gates-MacGinitie Reading Test, Iowa Test of Basic Skills, Missouri Mastery Achievement Test, and the Metropolitan Achievement Test, for students in the norming sample. It was reported that correlations ranged from .36 to .97 for grades one through six and .44 to .87 for grades seven to nine. No evidence of concurrent validity is reported. Norm referenced scores include percentile ranks, normal curve equivalents, and grade equivalents.
In a review of the test by Buros (2003) it was reported that the STAR-R should not be used in isolation, especially for early readers (Nebelsick-Gullet, 2003). It was further added that it limits the type of reading skills that can be sampled, lessening the diagnostic utility of its measure (Waterman, 2003).

Outcome Measures

This study focused on the construct of ORF as an outcome measure. The ORF measures consisted of separate scores for rate, accuracy, and prosody. Curriculum based measurement, through the use of reading passages, measured two of the three constituent elements of fluency: rate and accuracy. Prosody was measured by application of the National Assessment of Education Progress Prosody Scale score (Pinnell et al., 1995) to the participants’ oral reading on grade level passages.

Curriculum Based Measurement. Passages from the Houghton Mifflin were used in this study to obtain the measurement for rate and accuracy. The decision to utilize these evolved after substantial piloting of three unassociated sets of passages. The first set of passages was taken from basal readers not used in the school district. However, implementation of these passages proved to be a threat to internal validity due to the fact that the stories were shortened versions of popular children’s literature. Reading passages were then selected from CBM passages developed by Speece and Case (2001) which were implemented in Project AIM (Alternative Identification Models), a three-year, longitudinal investigation. The passages from Project Aim were selected because they correspond to grade level expectations. Furthermore, it was assumed that students participating in the study would not be acquainted with these selections. The passages
used for the AIM ORF probes were drawn from the participating school system’s reading curriculum. These passages were constructed by teachers who were given a list of grade appropriate books and were asked to select books that they expected students with average reading ability to read by the end of the school year. The Harrison-Jacobson Wide Range Readability Formula (Harris & Sipay, 1985) was used to ascertain that the 15 passages selected for the first grade fell between 1.5 to 2.2 grade level. The 20 second grade passages fell between 2.5 and 3.2 grade levels. The authors report that alternate forms of reliability and criterion-related validity were obtained from screening data. The reliability coefficient for ORF was .94. Predictive validity was obtained by correlating the fall screening CBM scores with the spring Woodcock-Johnson Psychoeducational Battery-Revised (WJ-R) Basic Reading cluster scores for participants that were administered both the LSF and ORF. The validity coefficient for ORF of the 135 grade 2 children was .78. However, the information obtained from this pilot revealed that there ceiling effects on rate and accuracy. All but one student read at or above the 75th percentile of the curriculum-based norms in oral reading fluency medians for the Grade 2 Fall Term. Seven of the students not only highly exceeded the 75th percentile for the Grade 2 Winter Term but for the Spring term as well.

Based on these results, three additional passages from the Leveled Reading Passages Assessment Kit form Houghton Mifflin were tested in a pilot study. Three reading passages were selected from the 22 reading passages in the Houghton Mifflin Leveled Reading Passages Assessment Kit that were specifically designed for diagnostic and assessment purposes. The authors report that the passages have been field tested with
1,200 students across the United States. They further state that the field tests have validated the decidability, reading levels and developmental sequence and calibration of the reading passages as well as establishing benchmarks for below-level, on-level and above-level reading rate, accuracy, fluency and comprehension scores. General criteria for text difficulty were based on those suggested in Fountas & Pinnell’s *Matching books to Readers*. These include number of words, phonic complexity, range of punctuation, familiarity of text, language structure, sentence structure, point of view, receptive language and vocabulary. However, the reproduction of these passages for the student copy altered criteria such as number of lines on a page, size of print, and spacing between words and between lines.

One passage was selected from the KL level (late grade 2) and two passages were selected from the MN level (early grade 3). Table 3 depicts the readability statistics for each passage. These passages proved to be more appropriate for assessing the oral reading fluency of second grade students due to their compatibility of the text with fluency norms for second grade level.

The researcher obtained the WCPM score for any student who took longer than one minute to read the entire passage, by counting the number of words the student read in one minute and subtracting the number of miscues (see Table 4). Deviations from print were classified as oral reading errors and include omissions, insertions, mispronunciations, silent pauses longer than five seconds and attempts longer than 10 seconds. The time, in seconds, to read the passage and the number of deviations from print were documented on site and were confirmed in an independent scoring by a
performance on miscues (omissions, insertions, repetitions, mispronunciations, silent pauses longer than five seconds and attempts longer than 10 seconds) were recorded and evaluated.

One measure of interest in this study was reading rate on the passages. Reading rate adopts the definition used in the National Center for Education Statistics, (NAEP, 2002), Oral Reading Study which states that rate is the speed at which the student reads aloud and is measured by how long it takes a student to read a passage. Rate is typically measured either as the average number of correct words per minute for the entire passage or as the number of correct words read in the first minute of oral reading. Reading accuracy refers to the degree that student’s oral reading corresponds to the conventionalism of letter-sound relationship of printed text. It is measured as the percentage of words read correctly and is calculated by dividing the total number of words read correctly by the total number of words read and multiplied by 100. Three passages were administered (see Appendix A) and an average score was calculated from the three passages.

Scoring Procedures

Each passage was coded for deviation from text, time and for prosody. Deviation from text involved identifying each error made by the reader. Miscues that were documented were those previously identified: insertion, omission, reversal, substitution, and word provided. The three time points in the passage, 60 second, 120 second and entire passage time were also coded. The time was documented by the digital recording of each passage. The researcher was able to identify the second the child began to read
and the exact second the reading of the passage was concluded. Words read incorrectly during the 60 and 120 second time points were subtracted from the total number of words read at each time point to determine reader’s rate and accuracy. Prosody scores were attained by listening to the digital recordings of the student’s oral reading twice. A rating of 1-4 points was assigned based on the NAEP fluency scale.

*National Assessment of Education Progress Prosody Scale.* ORF is an aggregate of three discrete components, one of which is prosody. For the purpose of this study, prosody was defined as the appropriate use of expressive interpretation and phrase chunking to convey meaning in oral reading (Dowhower, 1987; Schrieber, 1980, 1987, 1991; Schrieber & Read, 1980). The facility in which a reader demonstrates understanding and interpretation of the author’s message is manifested in which of the elements of oral reading expression such as tone, pitch, volume, phrasing and emphasis, are appropriately expressed. This ORF component was assessed using the NAEP four-level holistic scale for oral reading fluency developed in 1992. Assessment performance on the NAEP scale was based on one of four levels of pausing efficiency with four being the measure of highest fluency wherein readers attended to correct phrasing and one point awarded to readings that were primarily word by word with no attention to meaningful syntax (See Figure 3). Students were rated by the level of description that bests categorized the overall reading performance on all three passages.

This scale was developed for the fluency measure in NAEP’s 1992 study* Listening to Children Read Aloud: Data from NAEP’s Integrated Reading Performance Record at Grade 4* (Pinnell et al. 1995) and was used again, with no modification, in the
Fourth-Grade Students Reading Aloud: NAEP 2002 Special Study of Oral Reading (Daane, et. al., 2005) wherein fluency was defined in terms of phrasing, adherence to the author’s syntax, and expressiveness and is synonymous to the definition of prosody as used in this study. Examiners assessed intonation, stress and pauses during the oral reading process and hesitations between phrase endings and phrase beginnings while the student read aloud. A second element assessed by the fluency scale determined readers’ ability to discern the ideas expressed in the text through adherence to the syntax and sentence structure. Expressiveness in oral reading presentation, the third element, was rated through the reader’s ability to convey expressiveness naturally through the passage.

The 2002 NAEP (Daane et. al., 2005) study reported a strong relationship between the various components of ORF (fluency, accuracy and rate) as well as fluency scores being highly correlated with reading comprehension, as measured by the NAEP 2002 reading assessment. On average, the students that attained the highest level of reading performance were the students that had the highest rating on the NAEP oral reading fluency scale score.

Procedure

Prior to beginning the study written approval was obtained from the University of Miami Human Subjects Research Office to conduct the study (Appendix B). Next, written permission was obtained from the school district’s research office (Appendix C); the principal of the chosen school site was contacted and apprised of the study. Letters, accompanied by an Informed Consent Response Form (see Appendix D), explaining the research study was sent home to parents of all children in the second grade. In School A,
95% of the participants submitted an affirmative response and School B had a 72.5% affirmative response. After consent forms were returned, I contacted the school and obtained individual STARS-R data. To assure proportional allocation of participants to each of the four conditions, students were stratified according to their STARS-R results into one of four reading development categories depending on their percentile rank. To rule out selection bias, a simple random assignment within each stratum to one of the four conditions was conducted. The process of random assignment was performed by ranking students’ percentile score on the STARS-R. Each of the four conditions was assigned a number between 1 and 4 [Word Preview = 1; Listening Preview = 2; Summary Preview = 3 and No Preview = 4]. The first participant was assigned to condition 1, the second to condition 2, the third to condition 3 and the fourth to condition 4. The fifth participant was assigned to condition 4, the sixth to condition 3, the seventh to condition 2 and the eighth to condition 1. This pattern was repeated until all participants were assigned to an experimental condition. Each condition had an equal distribution of students’ reading performance.

The children with parental consent and who met eligibility requirement were pulled from classroom instruction for a single session for a period of 20 to 45 minutes. In School B participants were escorted to the examination room and were seated directly across from the examiner. After the experimenter explained the study and described the task the child was asked to sign the assent form which included consent into the study and permission to be tape recorded (see Appendix E). Assessments were conducted in an isolated area within the school which was free from distractions. All reading of word
lists, passages, and story retellings were tape recorded. Students in School A followed the same procedure with the exception that the reading of passages was held in the back of the child’s classroom making it impossible to eliminate all distractions.

During the oral reading of the passage, guidelines accompanying the administration of the NAEP oral reading study (Daane et al., 2005) were implemented if participants requested assistance with vocabulary. They were told, “If you can’t figure out a word, you can guess or skip it and go on.” At no time during the session were students given feedback with regard to their performance. Upon completion of the session a small, tangible token was given to each child, who was then be escorted back to the classroom or instructed to return to his or her desk.

**Experimental Conditions**

All participants were randomly assigned to one of four previewing conditions. Stratification was performed by ranking the STAR-R score from highest to the lowest. Systematically, going down the list of the STAR-R score, participants were placed in each condition as follows: Word Preview, Listening Preview, Summary Preview, No Preview, No Preview, Summary Preview, Listening Preview, Word Preview as previously described. Students in each condition were asked to read aloud the same three passages.

Each condition was strategically designed to isolate the effects of the components of ORF with respect to reading comprehension. Using the Hypothetical Model (See Figure 2) that depicts a reciprocal effect of the interrelationship of oral reading fluency components and comprehension processes each of the previewing conditions map onto
the various components in order to determine a directional effect (see Figure 4). The
Word Preview condition maps onto automatic word recognition. Students in this
condition get the added benefit of a lexile priming effect. The Listening Preview
condition maps onto both prosodic reading and comprehension. Students in this condition
get the added effect of a prosodic modeling and comprehension priming effect. The
Summary Preview condition maps onto comprehension. In this condition the students get
the added benefit of a comprehension priming effect.

Condition 1: Word Preview (WP). The participants in this treatment were
requested to read a randomly ordered list of isolated words that were taken from the
passage and presented in list form. No two words from the passage were duplicated.
While the student was reading the list of words, rate and accuracy were recorded;
however, these results were verified against the digital tape recording to confirm
accuracy of recording by a researcher blind to the conditions. Students were presented
with a list of words in random order accompanied by the following instructions: “Here
are some words. You will read the words. If you do not know a word, I will tell you that
word.” Once the student read the list of words the following instructions were given.
“Now, you will read this story aloud to me. It contains all of the words you have just
read. Read it as quickly as you can and as well as you can. When I say ‘Begin’ start
reading aloud. When you have finished, I will ask you to tell me about what you have
read. Let’s start now.” The passage was placed in front of the student and the researcher
pointed to the start of the story, and said ‘Begin.’ The timer was started when the student
began reading the first word. The researcher placed a slash mark after the last word read
at the 60 second and 120 second points. After the reader finished reading the passage, the timer was stopped. Two additional stories were presented in the same manner. Reading of passages was tape recorded.

**Condition 2: Listening Preview Condition (LP).** Students in condition 2 listened to a prerecorded passage and were then required to read the same passage orally. The following instructions were given: “You are going to listen to a story. Then, you will read the same story aloud to me. Read it as quickly as you can and as well as you can. When I say ‘Begin’ start reading aloud. When you have finished, I will ask you to tell me about what you have read. Let’s start now.” The examiner then turned on the CD player so the student could listen to the passage being read. After the CD player was turned off, a copy of the passage was placed in front of the student and the examiner pointed to the start of the story and said “Begin.” The timer was started when the student began reading the first word. The researcher placed a slash mark after the last word read at the 60 second and 120 second points. After the reader finished reading the passage, the timer was stopped. Two additional stories were presented in the same manner. Reading of passages was tape recorded.

**Condition 3: Summary Preview Condition (SP).** The participants in this treatment group were presented with a concise and coherent summary of the passage by the researcher. Immediately following the summary they were asked to read the passage. The following instructions were given: “I am going to ask you to read a story aloud to me. Before you read the story you are going to be told about it by listening to the audio tape. Then I’ll give you the page I want you to read. When I say ‘Begin’ start reading aloud.
Read it as quickly as you can and as well as you can. When you have finished, I will ask you to tell me about what you have read. Let’s start now.” The examiner then presented a summary of the passage. A copy of the passage was placed in front of the student and the examiner pointed to the start of the story and said “Begin”. The timer was started when the student began reading the first word. The researcher placed a slash mark after the last word read at the 60 second and 120 second points. After the reader finished reading the passage, the timer was stopped. Two additional stories were presented in the same manner. Reading of passages was tape recorded.

*Condition 4: No Previewing (NP).* This group was given the passage with no previewing. The passage was placed in front of the student and the researcher pointed to the start of the story, and said ‘Begin’. The timer was started when the student began reading the first word. The researcher placed a slash mark after the last word read at the 60 second and 120 second points. After the reader finished reading the passage, the timer was stopped. Two additional stories were presented in the same manner. Reading of passages was tape recorded.

For all conditions, immediately after each participant completed each oral reading of the passage, the examiner instructed the participants to retell the story in their own words. The students were given the following instructions: “Take a minute to think about how you will tell the story. Let me know when you are ready to tell the story. Tell me everything you remember about the story you have just read as if you were telling a friend about it.” If at the end of two minutes the participant had not begun retelling, the examiner asked: “Are you ready to begin?” When there was any ambiguity in the
retelling process, the participant was asked to clarify. These audio retellings were tape recorded for later scoring.

**Data Cleaning**

Preliminary analysis of data involved detection and correction of errors in coding (Mason, Gillenwater, Pugh, Kenefik, Collins, Whitaker, & Volk, 2006) and elimination of noisy data or outliers. Initial analyses involved a data screening process carried out to identify outliers, missing data, unusual data points or atypical distributions that may require transformation before analysis could be conducted. Descriptive statistics were calculated on accuracy over the three passages and WCPM over the three passages to check for data normality, as well as means, standard deviations and relevant characteristics including skewness and kurtosis.

The first step to cleaning the data was to examine the data for outliers. For this step, a boxplot was constructed for the following dependent variable: Accuracy over the three passages. A boxplot was created in order to show the spread of the data and identify any outliers, which may need to be corrected. The boxplot rule is a visual test to inspect for outliers. The interquartile range is included into a box and the 5% and 95% confidence intervals are indicated with error bars outside of the box. Values that lie outside of the confidence interval are possible outliers (Iglewicz & Hoaglin, 1993).

The results of the boxplot for accuracy over the three passages identified three extreme outliers with accuracy scores of 65.6, 77.1, and 83.6. A decision was made to extract these subjects’ scores from the data set because they were identified not only as extreme scores statistically, but were also considered extreme scores on a theoretical
basis. Oral reading fluency assessments are usually conducted on text at the independent reading level which is approximately 90% accuracy rate. Fluency assessments are not considered valid when conducted with text that is too difficult for the child (i.e., a student’s frustration level). Betts (1946) established the original criterion that frustration reading level is defined as the “inability to pronounce ten per cent or more of the running words” (p. 451). Readers unable to read at a 90% accuracy level would be unable to execute a fluent rendition of the printed text (Betts, 1946). The outliers that were excluded from this study had a reading accuracy score less than 90% over the three passages.

At the conclusion of the data cleaning process, the final sample consisted of 181 students out of the original sample which contained observations on 187 students, all of whom were randomly assigned to one of four experimental conditions. However, three students had missing data due to technical difficulties, which resulted in recording only two of the three passages. Additionally, as explained earlier, scores from three students were eliminated due to outlier effects. Therefore, the data from 181 students were used in the remaining statistical analysis. The total number of participants in each condition ranged from 45 in the Word Preview Condition, 46 in the Listening Preview Condition, 44 in the Summary Preview Condition and 46 in the No Preview Condition. The subjects who were omitted from the analysis were all from School A. Therefore, there were 123 students in School A and 58 students in School B in each of the analysis.

Descriptive statistics were conducted on four dependent variables of interest for each passage: WCPM at 60 seconds, WCPM at 120 seconds, Total WCPM, and the
NAEP score. Table 5 presents the means and standard deviations for each of the dependent variables by passage, by condition and by school. The reader will also find the average performance over all three passages for each of the three WCPM measurement points (WCPM at 60 second, WCPM at 120 seconds, and WCPM across all three passages) and the NAEP score. Also recorded on this table is the overall performance across condition for each of the passages and over all of the passages. The analyses involving each of these variables will be described separately in the results section.

**Interrater Agreement**

Four independent raters, blind to condition, coded a random sample of 18% of the data. Each rater scored the accuracy, rate and prosody for each of the three oral readings produced by the students in each of the four conditions and in each of the two schools (Hiebert & Fisher, 2002; Jenkins, et al., 2003). Intra-class correlation coefficient (ICC) analyses using an absolute agreement and average measure reliability model were run to estimate the correlation between the scores for the total errors for the four raters. Appendix F contains the forms and coding rubrics provided to the raters. The results indicated that the intra-class correlation was .99, indicating near perfect interrater reliability for coding of the total number of miscues. The interrater agreement was likely enhanced by the use of recordings which allowed raters to confirm the accuracy of their codings. Similarly, ICC was run for the NAEP scale prosody results using the same model and measure. Results produced an intra-class correlation of .87. Since a reliability coefficient of .70 or higher is considered “acceptable” in most social science research
situations, it was decided that there was sufficient agreement to continue coding the remaining passages.

Once interrater reliability was established the remaining passages were randomly distributed among the four raters for coding. The coding assignments were distributed as follows: rater 1: 35%; rater 2: 16%; rater 3: 16%; and rater 4: 33%.

In addition to oral reading accuracy scores for each of the passages, three other scores are available. These include WCPM 60 seconds (the amount of words read correctly during the first minute of reading a passage), WCPM 120 seconds (the amount of words read during the second minute of reading), and Total WCPM (the amount of words read correctly over the entire passage as calculated by subtracting the number of words read incorrectly from the total number of words in the passage divided by the time to read and multiplied by 60) and the NAEP oral reading score, which is the prosody score.

*Tests for Violations to the Assumptions of ANOVA and ANCOVA*

To assure that there were no violations to the assumption of ANOVA for equivalence of sample variance, the Levene Test for equality of error in variance, was performed on three dependent variables. The dependent variables utilized for these tests were WCPM 60 seconds over all passages (the average of the first minute of reading for each passage), WCPM 120 over all passages (the average of the second minute of reading for each passage), and Total WCPM over the three passages (the average WCPM over the reading of three passages). Upon examination of the boxplots it was determined that there were no violations of the assumption of equal variances as indicated by the null
results. However, the dependent variable Total WCPM over the three passages was not
normally distributed ($M = 95.8, SD = 3.8$, skewness $= -3.7$, kurtosis $= 23.2$) as can be
seen by the high kurtosis value. This was due to the three extreme outliers. With the
removal of these three outliers, this variable became more close to a normal distribution
($M = 96.2, SD = 2.7$, skewness $= -1.13$, kurtosis $= 1.1$).

Further tests to ensure there were no violations to the assumptions of ANCOVA
were performed by examining the association between the dependent variables and the
covariate score. The covariate score used was student performance on the STAR-R
score. Scatterplots were examined to determine the linear relationship of WCPM 60
seconds over passages, WCPM 120 seconds over passages and Total WCPM over
passages and the covariate. There was no indication of a curvilinear relationship, so it
does not appear that the linearity assumption was violated. Additional tests using the
same dependent variables were conducted to ensure there were no violations to the
assumptions of homogeneity of regression slopes. Since the significant level for the
interaction was greater than .05 on all three variables, it was assumed that there were no
violations of the assumption of homogeneity of regression slopes. This supports the
earlier conclusion gained from the inspection of the scatterplots for each condition.

*Research Design*

The design for this study was intended to examine reciprocal effects of
comprehension and reading fluency. Therefore, the purpose of this study was to
determine if there were any contributions from comprehension processing to oral reading
fluency. This was done by evaluating the effects of differences across previewing
conditions experienced prior to reading the text. Participants in the study were exposed to varying priming effects through the previewing conditions, including lexical priming, comprehension priming and prosodic modeling. As previously reported, the four treatment conditions were:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Condition Name</th>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Word Preview</td>
<td>WP</td>
<td>The participant will read a randomly presented list of all the words that appear in a passage.</td>
</tr>
<tr>
<td>2</td>
<td>Listening Preview</td>
<td>LP</td>
<td>The participant listens to a fluent reading of the story.</td>
</tr>
<tr>
<td>3</td>
<td>Summary Preview</td>
<td>SP</td>
<td>A summary of the story is presented prior to the reading of the story.</td>
</tr>
<tr>
<td>4</td>
<td>No Preview</td>
<td>NP</td>
<td>The participant is presented the story and instructed to read it aloud.</td>
</tr>
</tbody>
</table>

The following two research questions were addressed:

1. Are there differences in oral reading fluency as a function of differences in the type of priming readers get prior to reading a story?

2. Are the effects of the experimental conditions different across levels of reading ability?

*Hypotheses*

Hypotheses that test the effects of lexical priming, comprehension priming and prosodic modeling on ORF and prosodic reading were addressed. The above research questions were tested through statistical analysis of the following eight hypotheses. Note that the symbol greater than (>) should be interpreted as “will be better than” given that
accuracy and speed outcomes would require different notations. Table 6 illustrates the effect of comprehension priming and word priming on each of the four experimental conditions.

1. The unique effect of lexical priming on CWPM should be evident in the difference in performance between subjects in the Word Preview condition and subjects in the No Preview condition such that:

   Word preview > No preview

2. The unique effect of lexical priming on NAEP Prosody score should be evident in the difference in performance between subjects in the Word Preview condition and subjects in the No Preview condition such that:

   Word preview > No preview

3. The unique effect of comprehension priming on CWPM should be evident in the difference in performance between subjects in the Summary condition and subjects in the No Preview condition such that:

   Summary Preview > No Preview

4. The unique effect of comprehension priming on NAEP prosody score should be evident in the difference in performance between subjects in the Summary condition and subjects in the No Preview condition such that:

   Summary Preview > No Preview

5. The unique effect of prosodic modeling on CWPM should be evident in the difference in performance between subjects in the Listening condition and subjects in the Summary condition such that:
Listening Preview > Summary Preview > No Preview

6. Additionally, the unique effect of prosodic modeling on NAEP Prosody score should be evident in the difference in performance between subjects in the Listening condition and subjects in the Summary condition such that:
   Listening Preview > Summary Preview > No Preview

7. The combined effect of prosodic modeling and comprehension priming on CWPM should be evident in the difference in performance between subjects in the Listening condition and subjects in the No Preview condition such that:
   Listening Preview > No Preview

8. The combined effect of prosodic modeling and comprehension priming on the NAEP Prosody score should be evident in the difference in performance between subjects in the Listening condition and subjects in the No Preview conditions such that:
   Listening Preview > No Preview

*Formal Analysis*

Formal analyses were guided by an interest in identifying whether participants in the study differed in oral reading fluency as a function of differences in the type of priming they were exposed to prior to reading a story. The statistical analyses relevant to this question were conducted in two steps. The initial set of analysis tested the effects of differences across passages, differences across schools, and differences across experimental conditions. A separate analysis was carried out for each of the four dependent variables used in the study, namely: WCPM at 60 seconds, WCPM at 120
seconds, Total WCPM and the NAEP prosody score. Each analysis was run as a Repeated Measures ANCOVA that included passage as a within-subject factor with three levels (Passage 1, Passage 2, Passage 3) and two between-subject factors: school (School A and School B) and condition (Word Preview, Listening Preview, Summary Preview and No Preview). Performance on the STARS-R was entered as the covariate in the overall analysis.
CHAPTER 4

RESULTS

Below are the results for four outcome measures: WCPM at 60 Seconds; WCPM at 120 Seconds; Total WCPM and the NAEP prosody scale. Each of these will be discussed below. The descriptive statistics of the ANCOVAs for each of these dependent measures are reported in Table 5. The results of each of the ANCOVAs are presented and discussed below. The results of the ANCOVA are presented in Table 7.

WCPM 60 Second Point. The results indicated that there was a main effect for STAR-R score, F (1, 172) = 111.0, p < .001) indicating that the level of reading performance, as determined by the STAR-R score, had a direct effect on the number of words students read correctly during the first minute of oral reading (see Figure 5). There was also a main effect for School: F (1, 172) = 7.02, p<.01). This effect can be attributed to the overall higher performance of students in School A than the students in School B. School A outperformed School B by an average of 12 points over the three passages (see Figure 6). The results also indicated that there was a significant School by Condition interaction, F (3, 172) = 3.09, p <.05 (see Figure 7). The variation of performance over condition appeared to be greater in school A as compared to school B. School A outperformed School B on the Listening Preview and No Preview conditions. The Listening Preview Condition appeared to offer School A a slight advantage during the first 60 seconds of reading while the Summary Preview seemed to benefit student performance in School B. No other effect in the analysis was significant. The marginal effect for Condition, F, (3, 172) = .064 is depicted in Figure 8.
**WCPM 120 Seconds.** An ANCOVA was also conducted to test variation in student performance as a function of passage, school, and condition for WCPM after two minutes of reading. The results of this ANCOVA are also presented in Table 7. As the table shows, there was a significant effect for **STAR-R score** \((3, 172) = 100.8, p < .001\). As consistent with this effect, the variation of performance during the second minute of reading, was a direct result of the level of reading performance, as determined by the STAR-R score (see Figure 9). No other effect in the analysis of WCPM 120 seconds was significant.

**Total WCPM.** An ANCOVA was also conducted to test variation in student performance as a function of passage, school and condition for WCPM calculated for words correct per minute on the entire passage. The results of this ANCOVA are also presented in Table 7. As was the case in all previous analyses, there was a main effect for **STAR-R score**, \(F (1, 172) = 110.6, p < .001\). These results are depicted in Figure 10. As consistent with this effect, the level of reading performance, as determined by the STAR-R score, had a direct effect on the number of words students read correctly over the entire passage of oral reading. The results indicated a significant **School** effect, \(F (1, 172) = 5.48, p < .05\). This effect can be attributed to the overall higher performance of students in School A than the students in School B. School A outperformed School B by an average of 11 points over the three passages (see Figure 11). This was consistent with the results of the analysis of WCPM at 60 seconds. There was also a main effect for **Condition** \(F (3, 172) = 2.71, p < .05\) indicating differences in performance across the conditions. As can be seen in Figure 12, the highest performance occurred for the
Summary Preview, followed by the Listening Preview, and then the Word Preview Condition. The No Preview Condition had the lowest performance. There was also a statistically significant School by Condition interaction, $F(3, 172) = 2.89, p < .05)$. The variation of performance over condition appeared to be greater in School A than in school B (see Figure 13). No other effect in the analysis was significant.

NAEP Score. The only significant effect for the ANCOVA conducted to test variation in student performance as a function of passage, school and condition of NAEP prosody score was the main effect for the STAR-R variable, $F(1, 172) = 95.01, p < .001$), as can be seen in Table 5. As consistent with this effect, the level of expressive reading performance, as determined by the STAR-R score, had a direct effect on prosodic reading (see Figure 14). No other effect in the analysis was significant.

In sum, the results in the first stage of the analysis revealed an overall effect of condition and a school by condition interaction as evidenced in terms of WCPM at 60 seconds and Total WCPM.

The second step in the analysis strategy involved further examination of the effects of condition by testing the differences in pair-wise contrasts of each of the preview conditions. Because condition interacted with school, the pairwise contrasts were performed separately for each of the school. Since the within-subjects factor for passage did not interact with condition, Total WCPM were averaged across all three passages. Because the ANCOVA results of WCPM 60 seconds (main effects for STAR-R and school and school*STAR-R interaction) were no different from Total WCPM, the contrasts were performed only on the Total WCPM variable. The Bonferroni adjustment
was used to control for family-wise Type I error rate. These analysis tested differences across each of the experimental conditions separate by school. Table 8 presents the tests of the pair-wise contrasts for Total WCPM averaged across three Passages. The reader is reminded that a graphic depiction of the effect of condition by school is presented in Figure 13.

The test of pair-wise contrasts indicated that there were, statistically, no significant differences between the conditions at School A. However, the results for School B indicate that the students in the Listening Preview and Summary Preview conditions outperformed the students in the No Preview condition. Moreover, there were no differences in performance between the Listening Preview and the Summary Preview conditions.

Another set of statistical analyses were performed to address the second research question which examined the interaction between the effects of experimental conditions and reading ability as measured by the covariate STAR-R score. An ANCOVA that included two between-subject factors: school (School A and School B) and condition (Word Preview, Listening Preview, Summary Preview and No Preview) and STAR-R Score was run. The results of this analysis are found in Table 9. As indicated in Table 9, there is a significant interaction between School and STAR-R score performance, $F(3, 168) = 7.47, p < .05$. The graph of the three-way interaction is presented in Figure 15. The strength in the associations between STAR-R score and WCPM read over the entire three passages is stronger in School B than it is in School A. As the figures show, there is significant variation in WCPM among students in School A who were at ceiling on the
STAR-R variable. These results, evaluating the interaction between condition and reading ability, indicate that these two variables did not interact. However, the relationship between condition and STAR-R Score is different in each school. Given the difference in overall performance in WCPM over school, the next logical step was to test the interaction between the condition and the covariate (the STAR-R score), ignoring the school factor, thus expanding the range of the distribution on WCPM. Results are presented in Table 10. The results indicate that there is a significant interaction of Condition by STAR-R Score, F (1, 180) = 30.20, p < .001. The graph of the two-way interaction is presented in Figure 16. These results would indicate that there is a difference between condition and levels of reading proficiency. It would appear that students who are reading at the 55th percentile range in the STAR-R score and who are at the threshold of acquiring reading fluency benefit most from the Listening Preview and Summary Preview conditions; however, students whose STARS-R score fall below the 55th percentile range and whose reading fluency rate as measured by WCPM is below grade level norms are apparently hindered by the Listening Preview and Summary Preview conditions as indicted by Figure 16.
CHAPTER 5

DISCUSSION

This study was motivated by an actual classroom event wherein a group of high achieving students struggled to comprehend a section of text, in which students read aloud with accurate decoding and word identification, but lacked prosody. When the same text was reread in a fluent manner, they were able to respond accurately to the comprehension questions. This led to querying the probability that comprehension played a role in the function of ORF, a question wherein, to date, there has been limited research.

A major goal of this study was to examine the relationship between ORF and comprehension processing. This present research built on past theoretical models of reading comprehension which established a causal model of the interrelatedness of fluency (see Figure 1). In this model speed, accuracy and prosody are determinants of comprehension. Previous research and theory is consistent with the model represented in Figure 1. First, La Berge and Samuels (1974) proposed that it is not possible for comprehension to occur, until words are read fluently. They contend that word identification is a skill that can be over-learned to the point of automaticity, thereby allowing attentional resources to be available for comprehension processes. Various adaptations have emerged since the introduction of the theory of automaticity. Posner and Snyder (1975) expanded the theory to introduce a two-process theory of contextual expectancy. Their spreading activation theory demonstrates how words in memory are activated through other words in context. This type of activation does not require conscious attention. Next, Stanovich built on Posner and Snyders’ theory to illustrate how
context is used to facilitate word recognition for both good and poor readers. Poor readers compensate for their lack of efficient decoding skills to tap into multiple sources that are available to them. Next, Perfetti’s verbal efficiency theory (1988) demonstrated that not only is lexical access automatic, but there is automaticity in syntactic parsing propositional encoding as well. These models of text comprehension purport that there exists a simultaneous execution of both automatic and attention demanding skills. These automatic processes include not only lexical decoding, but syntactic parsing, anaphoric references and inferencing. When these higher order reading skills become automatic, it is indicative that text comprehension has occurred. Therefore, being able to execute these skills to a point of automaticity should result in an increase of word processing speed as well as expressive reading of correct phrasing.

More recently, research has prompted further cogitation concerning the relationship between comprehension and ORF resulting in a causal model in which comprehension processing exerts direct effects on the components of ORF (see Figure 2). This second hypothetical model demonstrates a reciprocal relationship wherein comprehension assists the components of ORF (Allington, 1983; Jenkins, Fuchs, van den Broek, Espin, & Deno, 2003a; Kuhn & Stahl, 2003; Logan, 1997; Pikulski & Chard, 2005; Schwanenflugal, et al., 2006; Torgesen & Hudson, 2006).

The present study attempted to test the reciprocity assumption behind this model. Examination of the relationship between ORF and comprehension processing demanded isolation of the various processing factors that are believed to be related to differences in oral reading fluency performance. This was accomplished by randomly assigning on-
level readers to one of four priming conditions prior to reading a text. These conditions were lexical priming (Word Preview condition), prosodic modeling (Listening Preview condition), comprehension priming (Summary Preview condition & Listening Preview condition) and a no-priming condition. Specifically, the questions addressed in the study were:

1. Are there differences in oral reading fluency as a function of differences in the type of priming readers get prior to reading a story?
2. Are the effects of the experimental conditions different across levels of reading ability?

The main findings of the study established that there were differences in the rate of correct word reading as a function of previewing condition. Results indicate there is an advantage for the Summary Preview and Listening Preview conditions over the No Preview condition. However, this advantage was obtained among students from only one of the two participating schools, the school with the lowest overall performance in rate of correct word reading. The students in School B in the Summary Preview outperformed the students in the No Preview condition by a mean average of 23.75 words. This suggests that prior exposure to information about the overall gist of the passage aided students’ ability to read the words in the passage at a faster rate. These differential effects make it possible to be more definitive with regards to the link between ORF and reading comprehension. The results of this study suggest there is evidence to illustrate a reciprocal relationship between the components of oral reading fluency and comprehension processes. This was evident on a particular population as illustrated by
the significant results when the Summary Preview was compared to the No Preview among students who were at the low end of the scale for fluency proficiency. It is believed that these students were able to increase their word processing speed due to the effect of increased comprehension.

This premise that comprehension facilitates ORF is the result of multiple theories. For instance, Posner and Snyder (1975) would attribute the increase of fluency to the fact that students were reading connected text as opposed to words in isolation. They contend the connected text contains an automatic priming mechanism that is dependent on semantic cues that automatically and quickly activate the memory for rapid identification. Stanovich (1980) would further argue that there are multiple sources of information, such as orthographic, phonological, semantic and syntactic information, available to assist the poor reader who struggles with bottom-up decoding skills. Comprehension of the passage is necessary to tap into the sources that are not related phonological decoding. Perfetti (1988) would contend that these students were able to increase WCPM because they tapped, not only into automaticity of lexical access, but also automaticity of encoding propositions, because reading demands both speed and comprehension. Skills at the level of propositional encoding involve skills at the integrative comprehension level, including understanding anaphora and connectives and inferencing. All of these researchers have identified that automatic processes include lexical and comprehension processes. The students in this study who benefited from the summary and listening preview conditions were given access to comprehension priming. The evidence of this comprehension
became manifest through their ability to read words at a faster rate, clearly indicating that understanding of the passage facilitated their oral reading fluency.

It is important to try to understand and examine why the hypothesized effects involving the summary and listening conditions were obtained for only one of the schools in this study. This could be a result of differential levels of oral reading proficiency. Examination of the descriptive results revealed that the students in School A outperformed the students in School B by the amount of words read correctly. For example, in the first minute of reading students in School B read an average of 94.9 words per minute compared to 106.8 words per minute in School A. There were also differences between the two schools on the total measure of correct words per minute. Overall, School B read an average of 87.7 words per minute while School A read an average of 98.8 words per minute. The results for School B are close to the lower end of the scale for the average of recommended reading rates based on normative evaluations of reading rate for grade two. Rasinski (2004) suggests 90 WPM while Harris and Sipay (1985) suggest 85-120 WPM.

These results indicate that the students in School B are at the low average in fluency proficiency while students in School A are above average according to Rasinski’s scale. Therefore, when interpreting the results of the effect of preview condition on oral reading, an important consideration is that overall, the students in School A consistently outperformed the students in School B on WCPM, suggesting that the students in School B were not as proficient in oral reading performance. One plausible interpretation is that priming students’ understanding of the story, through listening to the story prior to
reading it or through listening to a summary of the story, enhances the oral reading fluency for students that are less proficient in reading fluency. This interpretation is consistent with the theory of comprehension offered by Kintsch (1988), who asserts that summaries can help the reader integrate the information to extend comprehension beyond the text level into a deeper, situational level. In addition, Leon (1997) argues that a summary helps the reader to “form a core concept which represents a general vision of the text”. Since Gomulicki (1956) further contends that propositions are more easily recognized after using a summary, it would appear that the reader was assisted to a greater degree by the summary effect and by the listening effect due to the ability to comprehend the passage.

In keeping with this study’s focus, these results address not only the issue of differences in oral reading fluency as a function of differences in the type of priming readers get prior to reading a story, but also the issue of reciprocal effects between ORF and reading comprehension. Since students were able to read more words after comprehension priming, it would be consistent with the conclusion that comprehension enhances the activation of words in context and activation encoding of propositions for faster rate of reading. These findings are consistent with Jenkins, et al., (2003b). They reported that word level processes contribute relatively more to fluency at lower levels while comprehension contributes more at higher levels. Furthermore, Jenkins, et al., (2003b) reported a difference in skilled readers’ fluency on grade level passages to exceed that of students with reading difficulty by approximately a factor of three. They attribute these differences in reading fluency results to the differences in rate the two
different groups process propositions contained within the text and to comprehension differences. The findings in this study are consistent with the theory that reading comprehension may be necessary to enhance the process of fluent reading (Thurlow & van den Broek, 1997).

Additionally, one interpretation to explain why there was an effect for only School B on the Listening and Summary Previews can be explained through individual differences in fluency performance. Profiles of good readers indicate that they are able to rapidly process words automatically (Goodman, 1967) which guides automatic syntactic parsing and encoding of semantic propositions (Fraser, 2004). Good readers also employ effective use of prior knowledge (Anderson, 1991; Haenggi & Perfetti, 1992). The students in School A, were on the higher level of the fluency normative scale, and were already mirroring the profile of good readers. Ultimately, these students did not benefit from any additional assistance offered by the priming effects of the previewing conditions. However, students, who are at the lower level of fluency acquisition, use an over reliance on contextual information to compensate for lack of efficient phonological processing (Stanovich, 1980). Therefore, the students in School B, who may not have a reserve of cognitive and metacognitive strategies, benefited in the dimensions of language knowledge and processing ability, as well as cognitive ability proffered by each of these two conditions (Listening Preview and Summary Preview) over the No Preview Condition. Research has shown that the greatest determining factor associated with prosodic reading is prosodic modeling. Students apply better phrasing and read with more expression and speed after prosodic reading has been modeled (Bowers, 1993; Young,
Bowers, & MacKinnon, 1996). In addition, comprehension priming, such that was offered from the Summary Preview condition, indicates facilitative effects for rate in that propositions are more easily recognized after using a summary (Gomulicki, 1956). Furthermore, even though weak readers over compensate for the lack of automatic and rapid word recognition by reliance on context clues (Stanovich, 1980), research has shown that only about 25% of words can be predicted through use of the context (Gough, Alford, & Holley-Wilcox, 1981). Therefore, it can be assumed that the Listening Preview and Summary Preview conditions presented the struggling reader with scaffolds to aid in speed of word reading.

Overall, results indicate that students in the Listening Preview condition outperformed the students in the No Preview condition by a mean average of 16.62 words. However, interestingly, the listening preview condition did not offer the expected advantage above and beyond the effect of the Summary Preview. It was hypothesized that the students in the Listening Preview Condition would have an advantage over the students in the Summary Preview Condition in the number of words read correctly. This was due to the fact that the Listening Preview Condition contained two priming mechanisms: comprehension priming and prosodic modeling. The literature has established that importance of modeling fluent reading. Students’ vocabulary and comprehension are increased by listening to expressive renditions of the text (Rasinski, 2003; Dowhower, 1987). In fact, Daly and Martens (1994) reported that listening previewing reported larger performance gains than did taped words previewing and silent previewing. In addition, Schrieber (1987) proposed that modeling fluent reading such as
that attained from the Listening Preview condition, affords the reader the use of prosodic features similar to those that are present in the spoken language. These features, such as pitch, speed of reading, and emphasis on key words, aid the reader to understand and interpret and gain meaning from the written language. This information is utilized without conscious attention, to construct meaning while reading (NRP, 2000). However, this study demonstrated no differences between the Summary and Listening previews. Both of these previews provide the same advantage over No Preview Condition and the Listening Preview Condition offered no benefit over the Summary Preview Condition.

Another notable finding relating to the results of this study is that lexical priming, accomplished through the Word Preview condition, did not benefit students relative to the No Previewing condition in either school. These results were surprising because it was hypothesized that student performance on WCPM in the Word Preview condition, with corrective feedback, would be greater than the performance of the students in the No Preview condition. This was not the case. The results indicate that there was no significant difference between the Word Preview and the Summary Preview conditions of student performance in both schools. These results did not replicate the findings of previous research (Levy, Abello, & Lysynchuk, 1997; Spring, Blunden & Gatheral, 1981), wherein targeting faster reading of words in a list produced significant results for increased speed and accuracy when reading these words in connected text. According to the Verbal Efficiency Theory (Perfetti, 1985, 1988), the verbal efficiency of the reader should become more efficient and automated due to the ability to recognize the words but students in the Word Preview Condition in School A actually read fewer correct words
per minute than students who were offered no previewing scaffolding at all data points for all three passages. Results, however, do support the finding which demonstrated when students were trained in rapid word identification there was no improvement in fluency of passages which contained the targeted words (Dahl, 1974; Dahl & Samuels, 1977; Fleisher, Jenkins & Pany, 1979). Therefore, it would appear that providing lexical priming of passage target words, offers no transfer effect to assist in speeding up the amount of words when they are read in connected text, suggesting that fluency is not just the result of word recognition proficiency.

Consistent with the literature (i.e., Anderson, Heibert, Scott, & Wilkinson, 1985; NRP, 2000; Pinnell, et al, 1995) on ORF and reading comprehension, the findings of this study support the evidence of a strong relationship between reading comprehension and reading fluency, as well as fluency scores being highly correlated with reading comprehension. There was a strong positive correlation between the STAR-R score and the NAEP Oral Reading Fluency scale score. On average, the students who attained the highest percentile in the STAR-R score, were the students who attained a higher fluency score. This main effect for STAR-R was consistent across all three data points and across all three passages.

An additional question this study was seeking to address was to examine the role of prosody in the relationship between fluency and comprehension processes. Specifically, is prosody a mediator of reading comprehension or a product of comprehension? It was hypothesized that modeling of prosodic reading of a text, such that was offered in the Listening Preview Condition, would result in more fluent reading
manifested through a higher score on the NAEP Oral Reading Fluency Scale. In addition, it was hypothesized that, by comprehending the passage, a reader is able to retrieve words quickly and accurately. The evidence of text comprehension is discernable through prosodic reading (Dowhower, 1987). However, results from this study did not reveal any statistically significant effects of prosody from any of the priming conditions. The mean average for all four conditions for each passage, with regard to the NAEP Oral Fluency Scale score, was identical with a score of 3.2 points on the four point scale. These results were unexpected based on the report of the document Fourth-Grade Students Reading Aloud: NAEP 2002 Special Study of Oral Reading (Pinnell et al., 1995; Daane, et al., 2005). In their large scale, national study, Pinnell, et al. did not consider fluency to be affiliated with rate and accuracy, but considered fluency a distinct element that represents the expressiveness of oral reading in terms of phrasing and the skill of adhering to the author’s syntax. The 2002 report, published by the NAEP, reported that approximately 61% of fourth-graders attained a rating in the two top levels of the fluency scale, leaving less than 40% of the students lacking minimally acceptable levels of fluency. In addition, only ten percent of the 61% of the students in the top two levels attained the highest level on the fluency scale, indicating that they read with phrasing that was consistent with the author’s syntax and with some degree of expressiveness.

Different results emerged from this study. Approximately 82% of the participants were classified as fluent as by the NAEP’s guidelines, with nearly half of these students attaining the highest rating on the prosody scale. Therefore, it can be concluded that there were no effects of prosody due to the fact that the participants were already reading
fluently. It is possible that the effects of the priming conditions on prosody could not be adequately evaluated due to the limited variation in expressive reading ability in the sample. Additional factors could account for these differences. First, the participants in NAEP study (2002) were fourth grade students with no exclusionary criteria. The participants in this study were in the second grade and any student who read below the 25th percentile level of the STAR-R score was excluded.

A second question addressed in this study was to determine if the effects of the experimental conditions differed across levels of reading ability. The results indicate that there is a significant difference between the four conditions over levels of reading proficiency as measured by the STAR-R Score. The Summary Preview and the Listening Preview conditions appear to aid WCPM, but only for those students who were on the threshold of developing oral reading fluency and who have adequate levels of reading ability as measured by STAR-R Score. An opposite effect occurs as achievement on STAR-R score gets below to the 55th percentile range at the same time the WCPM performance falls below a level that is considered normative for the second grade. Performance of these students in the Summary and Listening Preview conditions is reversed. Specifically, performance of students in these two previewing conditions is hindered, in that students in the Word Preview and No Preview conditions actually outperform students in the Summary and Listening Preview conditions.

The results of the condition by STAR-R score interaction (see Figures 13 and 14) further indicate that many of the students in School A were at ceiling of the STAR-R score. Additionally, a significant number of these students are performing considerably
higher than the expectation in fluency for their grade level. Therefore, it would appear that these students were able to perform at extremely high levels of fluency results while reading grade level passages, regardless of condition. Conceivably, there could be factors occurring in School A and School B that the researcher is not cognizant of and that are differentially affecting performance at each school. However, the data do suggest that there is a condition effect that interacts with reading ability that operates in tandem with the criteria discussed previously.

In summary, the results indicate that only the students in School B, who participated in the Listening Preview condition (listened to the passage prior to reading) and who participated in the Summary Preview condition (listened to a summary statement about the passage) had an advantage over those students in the other two preview conditions. However, benefits gained from these two conditions appear to be provisional. Students who attained an effect were within the lower bounds of normative performance in ORF for their grade. Additionally these students were above the 55th percentile of the STAR-R score. Conversely, students who appear to be struggling with both ORF and overall reading competence appeared to be disadvantaged by the Listening and Summary Preview conditions when compared to their higher performing peers. Although, significant effects for participants in the Listening and Summary Previews were reported for only one school, the interpretation that this finding might be generalizable across the entire sample can be proffered if we were to excogitate the findings from the perspective of individual levels of fluency development. However, the validity of this assertion needs to be examined in future research.
Implications

Theoretical Implications

Numerous research studies have reported findings to substantiate the interrelatedness of ORF, such that ORF is a predictor of reading comprehension (Fuchs, Fuchs, Hosp & Jenkins, 2001; NICHD, 2000; Wood, 2006), but the direction of this relationship is unresolved. As previously presented, the literature reports conflicting theories with regard to the relationship between ORF and reading comprehension. One theory posits that ORF is considered a prerequisite to reading comprehension. There are two predominant models that explain this theory: Automaticity and Reading Comprehension (La Berge & Samuels, 1979; Posner & Snyder, 1975; Stanovich, 1980; Perfetti, 1977, 1985; 1988; Logan, 1988; Carver, 1977, 1985, 1992, 1993, 2000) and Prosody and Reading comprehension (Schreiber, 1987; Dowhower, 1991). All of these models, despite variations, present fluency as the product of accuracy and fast word recognition, which in turn facilitates reading comprehension. The second theory states that there is a reciprocal relationship between the processes of oral reading fluency and comprehension. Current research has investigated the theory that a causal and reciprocal relationship between fluency and comprehension (Allington, 1983; Fuchs, van den Broek, Espin & Deno, 2003a; Kuhn & Stahl, 2003; Logan, 1997; Pikulski & Chard, 2005; Schwanenflugel, et al., 2006); however, this research is comprised of clinical studies (Jenkins, 2001; Torgesen, 1986) or correlational research (Breznitz, 1987; Schwanenflugel, Hamilton, Kuhn, Wisenbaker, & Stahl, 2004). This study attempted to
test the assumption behind these current theories that profess that speed of word recognition processing is aided by the fact that the reader comprehends the text.

Therefore, a contribution this study makes to the field was that it used an experimental design that isolated several of the sources of knowledge and/or experience that are believed to affect ORF, namely lexical effects, comprehension effects and prosody effects, to provide information about the interaction of each component with ORF. The study confirmed that comprehension priming, whether through listening preview or a summary preview, for students who were at lower levels of fluency for their grade, as measured by words correct per minute, positively enhanced the number of words read, connoting a reciprocal relationship between ORF and reading comprehension. The study’s results, implicating the role of comprehension processes as a function of reading fluency, validates the establishment of a new theoretical model to identify the reciprocal effect of the interrelationship of the components of ORF and comprehension processes (see Figure 2).

**Practical Implications**

This study was not intended as an intervention so it did not seek to introduce a teaching strategy that could help improve reading comprehension or reading fluency. However, the findings of the present study have significance for practices in reading instruction. Since the report of the NRP (2000), more demands are being made on teachers to incorporate a fluency component into their reading instruction. Good reading instruction incorporates fluency instruction to assist students to read accurately at a fast pace and with proper expression. This study demonstrates that prior to reading, if
students are presented with a brief summary of the text or if the text is read aloud to them, it may assist with ORF. As was discussed earlier, it is possible that this practice can activate relevant knowledge about the text and assist with speeding up the acquisition of vocabulary and propositional encoding. Prior to students reading a story, a listening preview or summary preview could offer benefits to all students, with a greater enhancement of faster word reading to those students who are in the low average of fluency proficiency. Since there were no significant differences between the Listening Preview and the Summary Preview with regards to word recognition processing speed results, and taking into consideration that instructional time is a precious commodity in the classroom, a brief one minute summary may play a major role in activating comprehension processes which would allow the students to read more. Therefore, the results of this study further suggest that for students who are challenged with fluency, front loading a lesson rather than having students summarize a section of text at the end of the reading, would be more beneficial to ORF. Notwithstanding, students with reading difficulties vary with regard to reading skills, the current study suggests that providing students with a summary prior to being instructed to read passages in the content areas, may be an effective accommodation procedure. The summary preview appears to be an effective procedure that may be a viable instructional technique. Its viability is enhanced by the ease with which it may be incorporated into any lesson with minimal demands on time and preparation.

For decades it was believed that fluency was the result of word recognition proficiency (Armbruster, Lehr, & Osborn, 2001) so the main focus of classroom
instruction was on the development of word recognition. The results of this study would support the argument that a curriculum that is highly guided by word lists as opposed to contextual reading puts students at a disadvantage. Even though past research has demonstrated that drill on word lists may improve students’ ability to recognize the words in isolation, this study supports the research that there is no guarantee students will be able to transfer these words to the words as they are in context. Developing reading fluency in texts must be developed systematically and is aided through the comprehension of the text.

**Limitations**

A number of limitations should be noted when appraising the implications of this study. First, there was an effect for only one school in the study. It was found that the effect was not generalizable to both schools. In addition, the participants in this study were all second grade students. Results may vary for older students or younger students since the literature designates the developmental trajectory of ORF to have the greatest growth in primary grades. In the intermediate grades a negatively accelerating curve occurs. The literature further confirms that the strongest relationship between ORF and reading comprehension exists in the elementary and junior high levels rather than in older individuals (e.g. Jenkins & Jewell, 1993).

The sample of this study was limited to students who were on-level readers. However, the results indicate stronger effects for priming conditions for the participants whose performance in reading fluency was slightly lower than the performance of those students who were more proficient with respect to ORF. It has been demonstrated that
ORF is facilitated by a Listening Preview condition and a Summary Preview Condition for on-grade level readers, so these results are generalizable only to this specific population. Without further studies, it is unknown if these two previewing conditions would facilitate enhanced ORF to students who are below level readers.

One limitation to this study involves the readability of the passages utilized for this study. All passages were selected based on Lexile levels (Schnick & Knuckelbine, 2000) within the range of L500 and L600. Houghton Mifflin has rated these passages to range from late grade 2 to early grade 3. As the results indicated, the fluency performance of students in School A was well within the range of average and above average fluency scores. However, student performance in School B was in the lower range of fluency performance. It is unknown what, if any, previewing condition may affect the interaction between comprehension and ORF for the students in School A, if the text level of the passages were more challenging.

Furthermore, there are potential limitations to the interpretation of the data with regard to prosody. The constrictions of the NAEP Oral Reading Fluency Scale measure prohibited subtle differentiation of scoring procedures. The four-point scale offered little room to differentiate performance among the students’ renditions. I would recommend that the expressive reading of passages in this study be reevaluated using a different measure. According to Rasinski (2004) several rubrics have been designed that effectively evaluate the expressive component of reading fluency (i.e. Allington, 1983; Allington & Brown, 1979, Pinnell, 1995; Zutell & Rasinski, 1991). One suggestion for an alternative prosody measure is an adaptation, by Rasinski, of six-point fluency devised by
Allington (1983) which is a multidimensional prosody rubric, requiring lengthier and more critical observations. Rasinski’s (1985) reports this instrument to have a test-retest reliability of .90 and claims it to be strongly associated with the students’ performance on a standardized test of reading proficiency. Of importance, the results of the prosody measure in this study were intended to contribute to the existing knowledge to expand the theory of the relationship between fluency and comprehension processes, rather than as a guide to the developmental progress of students’ ability to attain higher levels of interpretive reading. Therefore, it is highly recommended that less subjective and more precise measures be implemented as the prosody measure with the utilization of a computer programme software for assessing expressive reading.

Additionally, the findings of this study are limited to second grade students who were native English speakers. Therefore, it is not known if similar results would occur for students who are older or who are younger based on the developmental trajectory of ORF (Jenkins & Jewell, 1993). Also, it is unknown whether or not these findings would be replicated with a population of English language learners.

Despite these limitations, the study has served to address the specific research questions and has proffered interesting findings. The comparison of the different experimental conditions has given insight into the reciprocal nature of comprehension and reading fluency. The analyses also shed light on the use of different previewing conditions more suited to students who are struggling with fluency.
Future Research

Overall, the results of this study are encouraging. The present research offers a greater understanding into oral reading fluency and provides tentative evidence that comprehension processes feed back to fluency by increasing the rate of oral reading fluency. Results show that by enhancing some aspect of comprehension prior to reading, fluency is elevated. However, these results were evident only for students who have limited proficiency in ORF and who also possess sufficient reading skills to be able to tap into the resource of comprehension priming. Due to the imprecise measure for prosody, only rate of reading and accuracy could be used as variables to determine this relationship. Future studies should include an examination of all the components of reading fluency within the context of exploring the relationship between ORF and reading comprehension.

Given that the ultimate goal of reading is the construction of meaning (Anderson, et al, 1985), it is important to assess the role comprehension plays in reading fluency. Most research examines comprehension as a function of oral reading. Future research should focus on the influence of comprehension on the different components or ORF, such as the influence of comprehension on text phrasing requires further investigation. Effective research on oral reading fluency and comprehension processes demands adequate measures to assess all three components of ORF: rate, accuracy and prosody. Examining the role of prosody in the development of reading fluency and the ways in which it contributes to the development of reading comprehension is not easily quantifiable and measurable. It consists of a series of features including pitch, stress or
and tempo to encompass the rhythmic patterns of language (Allington, 1983; Dowhower, 1991; 1997; Schreiber, 1987). In addition, prosody includes appropriately chunking groups of words into phrases or meaningful units according to the text. All of these features are more difficult to quantify than reading rate and accuracy. Currently, prosodic reading remains a difficult construct to measure reliably and efficiently. Further research to create and test appropriate measures for evaluating prosody should be considered.

Research to measure prosody should be carried out so that gains in expressive reading can be compared to overall reading competence and to assess if comprehension processes influence prosody scores.

Future research should also attend to text difficulty as a variable that may affect the interaction between comprehension processing and ORF. The passages implemented in this study consisted of approximately the same text level difficulty and contained approximately the same number of words. Future research should utilize texts of varying lengths and text difficulty, since text difficulty has been shown to differentially affect the performance of skilled and less skilled readers on oral reading errors.

One aspect of the results that has yet to be addressed was the disappearance of the school main effect and condition by school interaction during the second minute of reading. These effects were present both during the first minute of reading and for the reading over all the passages. It is difficult to understand or explain why this happened. Future research should be conducted to explain this discrepancy to determine if the lack of effect at the second minute of reading was a result of content overload or the interruption of some cognitive processes.
Although the current study supports the use of the summary and listening preview as a means to infer that the comprehension of the context feeds back to speed of activation of word recognition and propositional encoding, which in turn enhances rates of fluency, future research needs to establish and extend the theoretical validity of this study. Moreover, the sample of this study was limited to students who were on-level readers. Interestingly, however, the results indicate stronger effects for the participants whose performance in reading fluency was slightly lower than the performance of those students who were more proficient. The results of the three-way interaction of School B, which were very close to indicating a significant effect, warrant future research to pursue a stronger test and interaction of reading ability and previewing conditions to determine the impact with lower performers. Therefore, future studies should be conducted which include a population of students challenged with reading fluency.

Future research, having a broader distribution or different covariate, is recommended. The covariate in this study experienced ceiling effects which conceivably affected the results. Also, this study investigated the connection between ORF and comprehension processes, but there was no examination of the comprehension measure of the retelling of the passages. Since this data was collected, future research will involve examining the relationship between ORF and the experimental conditions on students’ comprehension of the passages. Furthermore, this study introduced a hypothetical model (see Figure 2) to theorize a reciprocal relationship between ORF and comprehension processes. Future research should be conducted and tested using structural equation modeling to examine the reciprocal relationship.
REFERENCES


Carver, R.P. (1997). Reading for one second, one minute, or one year from the perspective of reading theory. *Scientific Studies of Reading, 1*(1), 3-43.


Cattell, J. (1886). The time it takes to see and name objects. *Mind, 2*, 63-85.


FIGURES

Figure 1
A Causal Model of Interrelationship of Fluency

(Rasinski, 1984)
Figure 2
Hypothetical Model to show a Reciprocal Effect of the Interrelationship of Oral Reading Fluency Components and Comprehension Processes
<table>
<thead>
<tr>
<th>Fluent</th>
<th>Level 4</th>
<th>Reads primarily in larger, meaningful phrase groups. Although some regressions, repetitions, and deviations from text may be present, these do not appear to detract from the overall structure of the story. Preservation of the author’s syntax is consistent. Some or most of the story is read with expressive interpretation.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level 3</td>
<td>Reads primarily in three- or four-word phrase groups. Some small groupings may be present. However, the majority of phrasing seems appropriate and preserves the syntax of the author. Little or no expressive interpretation is present.</td>
</tr>
<tr>
<td>Nonfluent</td>
<td>Level 2</td>
<td>Reads primarily in two-word phrases with some three- or four-word groupings. Some word-by-word reading may be present. Word groupings may seem awkward and unrelated to larger context of sentence or passage.</td>
</tr>
<tr>
<td></td>
<td>Level 1</td>
<td>Reads primarily word-by-word. Occasional two-word or three-word phrases may occur—but these are infrequent and/or they do not preserve meaningful syntax.</td>
</tr>
</tbody>
</table>

Figure 4
Hypothetical Model to show Condition Characteristics on Various Component Characteristics on the Model of the Interrelationship of Oral Reading Fluency Components and Comprehension Processes

Key:
- WP = Word Preview Condition
- LP = Listening Preview Condition
- SP = Summary Preview Condition
Figure 5
Scatterplot of the Relationship between STAR-R Score and Performance on WCPM 60 Seconds
Figure 6
Average performance on WCPM 60 Seconds by School

![Bar chart showing average performance on WCPM 60 Seconds by School A and School B. School A has higher performance with a bar reaching up to 110, while School B has a bar reaching up to 90.]
Figure 7
Average Performance on WCPM 60 Seconds by School and Condition
Figure 8
Condition Effect at WCPM 60 Seconds
Figure 9
*Scatterplot of the Relationship between STAR-R Score and Performance on WCPM at 120 Seconds*

![Figure 9](image)

Figure 10
*Scatterplot of the Relationship between STAR-R Score and Performance on Total WCPM*

![Figure 10](image)
Figure 11
*Average performance on Total WCPM as a Function of School*

![Bar chart showing average performance on Total WCPM for School A and School B.](chart1)

Figure 12
*Condition Effect at Total WCPM*

![Bar chart showing condition effect at Total WCPM with different preview conditions.](chart2)
Figure 13
Average performance on Total WCPM as a Function of School and Condition

![Figure 13](image1)

Figure 14
STAR-R Score Effect on the NAEP Scale

![Figure 14](image2)
Figure 15
Condition Effect on the Total WCPM Overall for School

Experiment Condition

- Word Preview
- Listening Preview
- Summary Preview
- No Preview

Root Mean Square Error (R Sq Linear):
- FC Martin: 0.17
- Kendale: 0.183
- School: 0.503
- R Sq Linear = 0.476
- R Sq Linear = 0.556
- R Sq Linear = 0.653
- R Sq Linear = 0.698
- R Sq Linear = 0.703
Figure 16
*Condition Effect on the Total WCPM*

![Graph showing the effect of different conditions on total WCPM]
# Tables

## Table 1

*The Rauding Theory*

<table>
<thead>
<tr>
<th>Term</th>
<th>Measurement</th>
<th>Traditional Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rauding-efficiency level</td>
<td>$E_L$</td>
<td>General reading ability</td>
</tr>
<tr>
<td>Rauding-accuracy level</td>
<td>$A_L$</td>
<td>The level of ability to accurately comprehend while reading</td>
</tr>
<tr>
<td>Rauding-rate level</td>
<td>$R_L$</td>
<td>The rate of reading simple text</td>
</tr>
<tr>
<td>Cognitive Power</td>
<td>$C_P$</td>
<td>An intelligence factor reflective of working-memory capacity</td>
</tr>
<tr>
<td>Cognitive Speed</td>
<td>$C_S$</td>
<td>The primary factor influencing reading-rate level and is similar to naming speed</td>
</tr>
<tr>
<td>Auditory Accuracy Level</td>
<td>$\text{AudA}_L$</td>
<td>A representation of listening comprehension</td>
</tr>
<tr>
<td>Pronunciation Level</td>
<td>$P_L$</td>
<td>Decoding and word identification ability</td>
</tr>
</tbody>
</table>

## Table 2

*School and District Characteristics*

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>School A</th>
<th></th>
<th>School B</th>
<th></th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>African American</td>
<td>67</td>
<td>54.8</td>
<td>2</td>
<td>3.4</td>
<td>28</td>
</tr>
<tr>
<td>Hispanic</td>
<td>20</td>
<td>16.1</td>
<td>36</td>
<td>62.1</td>
<td>60</td>
</tr>
<tr>
<td>Caucasian</td>
<td>18</td>
<td>14.5</td>
<td>17</td>
<td>29.3</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>7.3</td>
<td>3.4</td>
<td>3.4</td>
<td>3</td>
</tr>
<tr>
<td>Mixed</td>
<td>9</td>
<td>7.3</td>
<td>1.7</td>
<td>1.7</td>
<td>----</td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
<td>100.0</td>
<td>58</td>
<td>100.0</td>
<td>100</td>
</tr>
<tr>
<td>Free and Reduced Lunch*</td>
<td>39.6</td>
<td></td>
<td>23.0</td>
<td></td>
<td>72</td>
</tr>
</tbody>
</table>
Table 3
Passage Readability Information

<table>
<thead>
<tr>
<th>Passage Characteristics</th>
<th>Passage 1</th>
<th>Passage 2</th>
<th>Passage 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houghton Mifflin Passage Level</td>
<td>MN early gr. 3</td>
<td>MN early gr. 3</td>
<td>KL late gr. 2</td>
</tr>
<tr>
<td>Flesch-Kincaid Grade Level</td>
<td>2.3</td>
<td>3.5</td>
<td>2.3</td>
</tr>
<tr>
<td>Flesch Reading Ease</td>
<td>92.7</td>
<td>83.5</td>
<td>93.2</td>
</tr>
<tr>
<td>Lexile Level</td>
<td>650</td>
<td>510</td>
<td>690</td>
</tr>
<tr>
<td>Number of Words</td>
<td>296</td>
<td>293</td>
<td>276</td>
</tr>
</tbody>
</table>
Table 4  
*Coding Errors*

<table>
<thead>
<tr>
<th>Error Type</th>
<th>Student Response</th>
<th>Text Script</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole word omission</td>
<td>He wished</td>
<td>He secretly wished</td>
<td>1 error</td>
</tr>
<tr>
<td>Partial word omissions</td>
<td>In</td>
<td>inside</td>
<td>1 error</td>
</tr>
<tr>
<td>Contiguous word omission</td>
<td>Dad wouldn’t be back for two hours</td>
<td>Dad wouldn’t be back for at least two hours</td>
<td>2 errors</td>
</tr>
<tr>
<td>Whole word insertions</td>
<td>Wanting his very own puppy</td>
<td>Wanting his own puppy</td>
<td>1 error</td>
</tr>
<tr>
<td>Inserts of prefixes and suffixes</td>
<td>Return Unhappy</td>
<td>Turn happy</td>
<td>1 error 1 error</td>
</tr>
<tr>
<td>Mispronunciation</td>
<td></td>
<td></td>
<td>1 error</td>
</tr>
<tr>
<td>Addition</td>
<td>People thought that the moon …</td>
<td>People thought the moon ….</td>
<td>1 error</td>
</tr>
<tr>
<td>Provided word Repetition</td>
<td>3 second pause On the moon, on the moon, there is…</td>
<td>Teacher provides word On the moon, there is…</td>
<td>1 error 1 error</td>
</tr>
<tr>
<td>Reversal</td>
<td>Something was wrong</td>
<td>Was something wrong</td>
<td>1 error</td>
</tr>
<tr>
<td>Substitution</td>
<td>Dad worked in another town</td>
<td>Dad works in another town</td>
<td>1 error</td>
</tr>
<tr>
<td>Self-correction</td>
<td></td>
<td></td>
<td>No error</td>
</tr>
</tbody>
</table>
Table 5
Means and Standard Deviations on WCPM variables and NAEP prosody score as a Function of Passage, School, and Condition

<table>
<thead>
<tr>
<th>Variable</th>
<th>School B</th>
<th>Word Preview</th>
<th>Listening Preview</th>
<th>Summary Preview</th>
<th>No Preview</th>
<th>Total Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 15</td>
<td>N = 15</td>
<td>N = 14</td>
<td>N = 14</td>
<td>N = 14</td>
<td>N = 14</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>WCPM 60 Second</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passage 1</td>
<td>101.1</td>
<td>25.8</td>
<td>97.8</td>
<td>31.7</td>
<td>104.8</td>
<td>26.7</td>
</tr>
<tr>
<td>Passage 2</td>
<td>94.7</td>
<td>34.9</td>
<td>93.6</td>
<td>31.5</td>
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<td>Passage 3</td>
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Table 6
Expected Effects of Priming Methods and Modelling on Conditions

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<td>Summary Preview</td>
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<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Listening Preview</td>
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<td>+</td>
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Table 7
Results of ANCOVAs on WCPM Variables and NAEP Prosody Score by Passage, School and Condition

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<th>Effect</th>
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<td>F-value</td>
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<td>STAR-R Score</td>
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<tr>
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<td>------</td>
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<td></td>
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<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
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<td>Passage * School</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
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<td>Passage * Condition</td>
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<td>------</td>
<td>2.84 *</td>
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<td>Passage * School * Condition</td>
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p < .05
**p < .01
***p < .001
Table 8
Table of Pairwise Comparisons for Total WCPM Separate by School

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<tr>
<th>(I) Experimental Condition</th>
<th>(J) Experiment Condition</th>
<th>Mean Difference (I-J)</th>
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<th>Sig</th>
<th>(I) Experimental Condition</th>
<th>(J) Experiment Condition</th>
<th>Mean Difference (I-J)</th>
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<th>Sig</th>
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<td></td>
<td></td>
<td></td>
<td>School B</td>
<td></td>
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<td></td>
<td>Summary Preview</td>
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<td>6.04</td>
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<td>Summary Preview</td>
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<td>.500</td>
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<td>Word Preview</td>
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<td>.500</td>
<td>Summary Preview</td>
<td>Word Preview</td>
<td>11.53</td>
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<td>.039</td>
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* The mean difference is significant at the .05 level
Table 9  
*Results of tests of the two and three way interaction between STARS score, Priming Condition, and School on Total WCPM.*

<table>
<thead>
<tr>
<th>Effect</th>
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<tr>
<td><strong>Main Effects</strong></td>
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<td>STAR-R Score</td>
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<td>114.83</td>
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<tr>
<td>School</td>
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<td>**</td>
</tr>
<tr>
<td>Condition</td>
<td></td>
<td></td>
<td>--------</td>
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</tr>
<tr>
<td><strong>Interactions</strong></td>
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<tr>
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<tr>
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<td>--------</td>
<td></td>
</tr>
<tr>
<td>Condition * School * STAR score</td>
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<td></td>
<td>--------</td>
<td></td>
</tr>
</tbody>
</table>

\*p < .05  
** p < .01  
***p < .001

Table 10  
*Results of Tests of the Two and Three-way Interaction between STAR-R Score, Priming Condition on Total WCPM.*

<table>
<thead>
<tr>
<th>Effect</th>
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***p < .001
APPENDICES
APPENDIX A: Oral Reading Passages

PASSAGE A
Matty was having a quiet day. It was so quiet she could almost hear the grass grow. Suddenly, she heard a cry for help.

“Help, help! Miss Kitty is stuck in a tree,” said her friend Ryan.

Matty ran next door. Sure enough, Miss Kitty was at the top of a tree. She didn’t look as if she was in a rush to come down.

“Don’t worry, Ryan,” said Matty. “Miss Kitty will come down when she’s good and ready.”

“I need to get her down before Mrs. White comes back from her vacation,” said Ryan. “I said I would take good care of her cat.”

“Cats always come down when they’re hungry,” said Matty.

“But Matty, Mrs. White’s coming back this afternoon! And Miss Kitty just ate. She won’t be hungry for hours,” wailed Ryan.

“Don’t worry, I’ll think of something,” promised Matty.

They tried getting Miss Kitty down with cat treats. “Here, kitty, kitty,” they pleaded. Nothing worked.

“Wait here, Ryan,” Matty said. “I’ll be right back.”

Matty raced home and ran into the kitchen. There she found what she was looking for. She knew exactly what would make a cat come down from a tree.

Matty hurried back to Ryan. She placed a bag on the ground below the tree, where Miss Kitty could see it.

Miss Kitty stared at the bag, suddenly interested. All at once she sprang down from the tree and ran inside the open bag.

“Thanks, Matty” sighed Ryan. “How did you know what to do?”

“I knew that cats are curious,” Matty replied. “I had a feeling Miss Kitty wouldn’t be able to resist climbing inside that bag.”

“You’re the smartest person I know,” said Ryan. “I’m glad you’re my friend.”

“I just know my cats,” said Matty.

PASSAGE B

Ginger and Casey had done everything together since they were puppies. Wherever Ginger went, Casey would follow right along.

They were very happy where they lived. The family had a girl and a boy, just like Ginger and Casey. Only they were human, and their names were Kerry and David.
One day, the dogs were in the backyard. Ginger found a hole in the fence and decided to go through it. As usual, Casey followed right along.

Ginger and Casey trotted along a winding path. Finally, they came to a river. Neither one of them had ever seen a river before.

Ginger was curious. First she sniffed the water. It made her nose feel funny. Casey sniffed the water too. Then she touched the top of the water with one of her paws. It was wet! Casey dipped his paw in the water too.

The next thing Casey knew, Ginger jumped into the water. But this time, Casey didn’t follow right along.

Ginger started barking and tried to get back on land. The river began to carry her downstream.

Casey ran along the shore, barking as loud as he could. Ginger was paddling against the pull of the water, but she was getting tired.

Then Casey heard familiar voices.

“Casey! Ginger! Where are you?” It was David and Kerry.

Casey and Ginger both started barking at once. David and Kerry ran toward the sound of the dogs.

“There you are!” David said as he threw his arms around Casey. Then he and Kerry saw poor Ginger struggling in the water. They grabbed her and helped her onto land.

Casey wagged his tail and licked Ginger’s face. This time Casey took the lead as they headed for home, and they all followed right along.

PASSAGE C

Uncle Allen came by Matt’s house one morning. “Let’s go for a hike, Matt,” said Uncle Allen.

“It’s raining, Uncle Allen,” said Matt.

“No, it’s not,” said Uncle Allen. “Look. The sun is coming out.”

“I don’t have hiking boots,” said Matt.

“You don’t need hiking boots,” said Uncle Allen. “Those sneakers will be fine.”

“I’ll miss my favorite cartoon on TV,” said Matt.

“You can see that cartoon any old time,” said Uncle Allen.

“Mom probably won’t let me go,” said Matt.
Matt’s mom came out of the kitchen. “Oh yes I will,” she said. “Go get some fresh air with Uncle Allen. It’ll be good for you.

So Matt and Uncle Allen drove to Williams Park. They hiked on the Rocky Point Trail. About a mile in, they saw a chipmunk scamper across their path. They heard a whooshing noise in the meadow. Two big birds burst out of the tall grass and headed for the woods.

At the pond, Uncle Allen and Matt saw a beaver with a stick in its mouth. It was swimming toward a dam made of branches, twigs, and mud. Five turtles were sunning themselves on the bank. Some ducks were quacking at the beavers.

When Uncle Allen and Matt got back to the house, Matt ran inside. He told his mom about all the things they had seen. Then Matt said, “I’m really glad I talked Uncle Allen into going for that hike.”

“Oh you are, are you?” said Uncle Allen, as he winked at Matt’s mother. “Maybe next time you won’t have to work so hard to get me to go”

They all laughed. Even Matt.
APPENDIX B: IRB Permission Form

July 27, 2007

Maria Carlo, PhD
University of Miami
School of Education
Department of Teaching and Learning
Coral Gables Campus, Locator Code: 3310

HSRO STUDY NUMBER: 20070487

STUDY TITLE: Effects of Text Previews on the Oral Reading Fluency of Second Grade Students

IRB MEETING DATE: 07/26/07

STUDY APPROVAL EXPIRES: 07/25/08

On July 26, 2007, the Social Behavioral IRB approved the following items. This study has been approved for the inclusion of minors pursuant to 45 CFR 46.404.

APPROVAL INCLUDES:
- New Research Protocol
- Research Materials (English versions only)
  - Parent Permission
  - Minor Assent Form
  - Morrow(2001) Story Retelling Analysis
  - NAEP Oral Reading Fluency Scale

NOTE: Translations of IRB approved study documents, including informed consent documents, into languages other than English must be submitted to HSRO for approval prior to use.

A request to continue this study must be submitted to the HSRO at least 45 days before IRB approval expires. If this study does not receive continuing IRB approval prior to expiration, all research activities must cease, and may officially be suspended or terminated.
APPENDIX C: District Permission Letter

Ms. Susan Massey  
6615 S.W. 56th Street  
Miami, Florida 33155

Dear Ms. Massey:

I am pleased to inform you that the Research Review Committee of the Miami-Dade County Public Schools (MDCPS) has approved your request to conduct the study, “Effects of Variations of Text Previews on the Oral Reading Fluency of Second Grade Students.” The approval is granted with the following conditions:

1. Participation of a school in the study is at the discretion of the principal. A copy of this approval letter must be presented to the principal.

2. Before entering an MDCPS school, the researcher must have a security clearance from the district. The researcher must present the following documents to the principal: (a) a copy of this approval letter, (b) a copy of the security clearance letter, and (c) a photo identification (e.g., a Florida driver’s license). The application for a security clearance is enclosed.

3. The participation of all subjects is voluntary.

4. The anonymity and confidentiality of all subjects must be assured.

5. Parent permission forms must be secured for all participating students prior to the beginning of the study.

6. The study will involve approximately 200 MDCPS students in grade 2.

7. Teacher participation is voluntary.

8. Disruption of the school’s routine by the data collection activities of the study must be kept at a minimum. Data collection activities must not interfere with the district’s testing schedule.

July 10, 2007
It should be emphasized that the approval of the Research Review Committee does not constitute an endorsement of the study. It is simply a permission to request the voluntary cooperation in the study of individuals associated with the MDCPS. It is your responsibility to ensure that appropriate procedures are followed in requesting an individual's cooperation, and that all aspects of the study are conducted in a professional manner. With regard to the latter, make certain that all documents and instruments distributed within the MDCPS as a part of the study are carefully edited.

The approval number for your study is 1371. This number should be used in all communications to clearly identify the study as approved by the Research Review Committee. The approval expires on June 30, 2008. During the approval period, the study must adhere to the design, procedures and instruments which were submitted to the Research Review Committee. If there are any changes in the study as it relates to the MDCPS, it may be necessary to resubmit your request to the committee. Failure to notify me of such a change may result in the cancellation of the approval.

If you have any questions, please call me at 305-995-7529. Finally, remember to forward an abstract of the study when it is complete. On behalf of the Research Review Committee, I want to wish you every success with your study.

Sincerely,

Joseph J. Gomez, Ph.D.
Chairperson
Research Review Committee

JG:mp
Enclosure

APPROVAL NUMBER: 1371        APPROVAL EXPIRES: 6-30-08
APPENDIX D: Parental Consent Form

August, 2007

CONSENT FORM

Dear Parent or Guardian:

Your (son/daughter) is invited to participate in a study on oral reading fluency and reading comprehension. The purpose of the study is to determine if oral reading fluency and reading comprehension assist one another. My name is Susan Massey and I am a doctoral student at the University of Miami, Department of Teaching and Learning. The results of this study will contribute to my dissertation as well as aid in the development of information and strategies to assist beginning readers.

If you allow your child to participate, the research will be conducted within a room in your child’s school. The study consists of the following activities:

1. Your child will be administered the DIBELS assessment.
2. Your child will take part in a one-time only activity that will last approximately 30 minutes.
3. The activity tasks may include: (1) listening to a story or a summary of a story that is on an audio tape and then read the same story; or (2) read a list of words and then read a story containing these same words; or (3) read a story aloud.
4. Your child will then be asked to tell about the story they read.
5. The session will be audio taped.

The project will be explained in terms that your child can understand, and your child will participate only if he or she is willing to do so.

No benefit can be promised to you or your child from his or her participation in this study. The study is expected to find out information that will lead to the development of strategies that teachers can use to help children with reading.

Any information that is obtained in connection with this study will remain confidential. His or her responses will not be linked to his or her name or your name in any written or verbal report of this project. Only my advisor, Dr. Carlo, and I will have access to information from your child. All records as a result of this study will be maintained in a locked file cabinet and a pass word protected computer inside a locked office. Only investigators of the study will be allowed to review the information. At the conclusion of the study, children’s responses will be reported as group results only. At the conclusion
of the study a summary of group results will be made available to all interested parents. Please indicate at the end of this consent form whether you wish to have these results. If so, please provide your mailing address.

Participation in this study is voluntary. Your decision whether or not to allow your child to participate will not affect your or his or her present or future relationship with the University of Miami. Even if you give your permission for your child to participate, your child is free to refuse to participate. If your child agrees to participate, he or she is free to end participation at any time. You and your child are not waiving any legal claims, rights, or remedies because of your child’s participation in this research study.

Should you have any questions or desire further information, please feel free to contact me:

Susan Massey at 305-284-9496 or email me at: smassey@miami.edu

Keep this letter after completing and returning the signature page to me.

If you have any questions about your rights as a research subject, you may contact the University of Miami Institutional Review Board (IRB) by mail at 1500 NW 12th Ave, Suite 1000, Miami, Fl., 33136, by phone at 305-243-3193, or by e-mail at ____________ This study (IRB #_______) was approved by the IRB on ________________.

You are making a decision about allowing your son or daughter to participate in this study. Your signature below indicates that you have read the information provided above and have decided to allow him or her to participate in the study. If you later decide that you wish to withdraw your permission for your son or daughter to participate in the study, simply tell me. You may discontinue his or her participation at any time.

Sincerely,

Maria Carlo, PhD.  
305-284-6495

University of Miami  
School of Education  
Merrick Building Room G  
Coral Gables  
Fl  33143

Susan Massey, MS  
305-609-7631
Please indicate whether or not you wish to allow your child to participate in this project by checking one of the statements below, signing your name and returning it to me. Sign both copies and keep one for your records.

_____ I do grant permission for my child to participate in Ms. Susan Massey’s study of oral reading fluency and reading comprehension

_____ I do not grant permission for my child to participate in Ms. Susan Massey’s study of oral reading fluency and reading comprehension

____________________________   _____________________________
Signature of Parent/Guardian    Printed Parent/Guardian Name

____________________________   _____________________________
Printed Name of Child      Date

_____ Yes, I would like a copy of the results of this study. My mailing address is below.

**Audiotaping**

By signing this section you give consent for your child to be audio taped during this study.

____________________________   Date
Signature of Participant      Date
APPENDIX E: Minor Assent Form

ASSENT FORM

Oral Reading Fluency and Reading Comprehension

I agree to be in a study about reading. This study was explained to my
(mother/father/parents/guardian) and (she/he/they) said that I could be in it. The only
people who will know about what I say and do in the study will be the people in charge
of the study.

In this study I will be asked to read a story and then tell about what I have read. I know
that when I am reading the story and telling about the story that the tape recorder will be
recording what I am saying.

Writing my name on this page means that the page was read to me and that I agree to be
in the study. I know what will happen to me. If I decide to quit the study, all I have to do
is tell the person in charge.

__________________________________________            __________________
Child's Signature                                                           Date

______________________________               __________________
Signature of Researcher                                                     Date

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APPENDIX F

Procedure for calculating words correct per minute

One-minute reading: Total words read - errors = words correct per minute

1. Count the total number of words the student read during the first 60 seconds of each passage. Record this on the data intake form.
2. Count the number of errors recorded during the first 60 seconds. Record this on the data intake form.
3. Subtract the average number of errors read per minute from the average total number of words read per minute.
4. Find the average WCPM for the three passages.

\[
\text{WPM} - \frac{\text{Number of Errors}}{\text{WCPM}} = \text{WCPM}
\]

5. Accuracy Percentage:
   \[
   \text{WCPM} \div \text{WPM} \times 100
   \]

6. If the student finishes the passage in less than one minute:
   Number of words in the passage – the number of errors/the time to read the passage X 60.
## Rating Prosody

NAEP Oral Reading Fluency Scale

<table>
<thead>
<tr>
<th>Fluent</th>
<th>Level</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>Reads primarily in larger, meaningful phrase groups. Although some regressions, repetitions, and deviations from text may be present, these do not appear to detract from the overall structure of the story. Preservation of the author’s syntax is consistent. Some or most of the story is read with expressive interpretation.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Reads primarily in three- or four-word phrase groups. Some small groupings may be present. However, the majority of phrasing seems appropriate and preserves the syntax of the author. Little or no expressive interpretation is present.</td>
</tr>
<tr>
<td>Nonfluent</td>
<td>Level 2</td>
<td>Reads primarily in two-word phrases with some three- or four-word groupings. Some word-by-word reading may be present. Word groupings may seem awkward and unrelated to larger context of sentence or passage.</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Reads primarily word-by-word. Occasional two-word or three-word phrases may occur—but these are infrequent and/or they do not preserve meaningful syntax. A score of 1 should also be given to a student who reads with excessive speed, ignoring punctuation and other phrase boundaries, and reads with little or no expression.</td>
</tr>
</tbody>
</table>

When the student has finished reading the passage aloud, record the appropriate prosody rating by circling the appropriate score in the Prosody Rating box on the data intake form.
## Marking Miscues Errors

<table>
<thead>
<tr>
<th>Error Type</th>
<th>Student response</th>
<th>Text Script</th>
<th>Error</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole word omission</td>
<td>He wished</td>
<td>He secretly wished</td>
<td>1 error</td>
<td>Circle:</td>
</tr>
<tr>
<td>Partial word omissions</td>
<td>In</td>
<td>inside</td>
<td>1 error</td>
<td>Circle:</td>
</tr>
<tr>
<td>Contiguous word omission</td>
<td>Dad wouldn’t be back</td>
<td>Dad wouldn’t be back for at least two hours</td>
<td>2 errors</td>
<td>Circle:</td>
</tr>
<tr>
<td>Whole word insertions</td>
<td>Wanting his very own puppy</td>
<td>very own Wanting his puppy</td>
<td>1 error</td>
<td>Carat:</td>
</tr>
<tr>
<td>Inserts of prefixes and suffixes</td>
<td>return Unhappy Counted as substitutions</td>
<td>un Turn happy</td>
<td>1 error</td>
<td>Carat:</td>
</tr>
<tr>
<td>Mispronunciation</td>
<td></td>
<td></td>
<td>1 error</td>
<td>Line through word:</td>
</tr>
<tr>
<td>Provided word</td>
<td>3 second pause</td>
<td>Teacher provides word</td>
<td>1 error</td>
<td></td>
</tr>
<tr>
<td>Repetition</td>
<td>On the moon, on the moon, there is…</td>
<td>On the moon, there is…</td>
<td>No error</td>
<td>Underline:</td>
</tr>
<tr>
<td>Reversal</td>
<td>Something was wrong</td>
<td>Was something wrong</td>
<td>1 error</td>
<td>Slash</td>
</tr>
<tr>
<td>Substitution</td>
<td>Dad worked in another town</td>
<td>Dad works in another town</td>
<td>1 error</td>
<td>Line through word:</td>
</tr>
<tr>
<td>Self-correction</td>
<td></td>
<td></td>
<td>No error</td>
<td></td>
</tr>
<tr>
<td>Disregarded punctuation</td>
<td></td>
<td></td>
<td>No error</td>
<td></td>
</tr>
<tr>
<td>Pauses</td>
<td></td>
<td></td>
<td>No error</td>
<td></td>
</tr>
</tbody>
</table>