# The Impact of Phonemic Awareness Instruction on Reading Growth in Pilot and Non-Pilot Schools and on Reading Growth in High Socio-Economic and Low Socio-Economic Schools

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## Abstract

The purpose of this study was to examine the impact of the first year of district-wide implementation of phonemic awareness instruction in the River Bluffs School District on reading growth, as measured by the Text Reading Comprehension (TRC). This study explored reading growth for kindergarten, first grade, and second grade students and examined the impact of phonemic awareness instruction on students from various socio-economic backgrounds. Additionally, the study examined differences in reading growth between schools according to whether phonemic awareness instruction had been implemented one or two years.

Data revealed that phonemic awareness instruction yielded statistically significant growth in reading for all grade levels at every TRC data point: beginning of year to middle of year, middle of year to end of year, and beginning of year to end of year. Students in each socio-economic status (SES) category (low, middle, high) demonstrated significant growth in reading at every TRC data point: beginning of year to middle of year, middle of year to end of year, and beginning of year to end of year. Finally, the analysis revealed no statistically significant differences in reading growth as a result of implementing one year or two years.

## Dedication

This dissertation is dedicated to my amazing and talented husband, Jeff, and my beautiful and curious daughter, Jada.

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This dissertation would not be possible without the contributions of my family, friends, and dedicated advisors. It is because of your time, resources, patience, love, and understanding that I was able to complete this journey.

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## Table of Contents

## List of Tables

## List of Figures

# Chapter One

## Introduction

Nationwide, schools are striving to implement the latest reading strategies and research; however, many of our schools still fail to increase National Assessment of Education Progress (NAEP) reading scores, as well as to meet adequate yearly progress measures of No Child Left Behind. The National Center for Educational Statistics reported that only 32% of the nation's fourth graders performed at or above proficient levels on the NAEP reading assessment (*The Nation's Report Card*, 2011). These NAEP results indicate that there have been relatively no changes in reading performance fo the nations fourth graders since 2009, and Missouri is one of only two states that scored lower in 2011 than in 2009 (*The Nation's Report Card*, 2011).

According to Juel (1988), a researcher known for her longitudinal studies on reading acquisition in children, first grade readers who struggled in reading almost always remained struggling readers by the end of fourth grade. Additionally, Gewertz (2007) reported that 44% of lower income students who scored in the advanced levels of reading fell out of advanced reading levels as they progressed through their elementary school years. In comparison, 31% of advanced readers in families with incomes above the national average dropped from advanced reading levels as they progressed through elementary school. Byrne and Barnsely (1993) identified phonemic awareness as the skill necessary to make and maintain adequate reading gains and found that students enrolled in school with sophisticated levels of phonemic awareness scored considerably higher on literacy measures.

The National Reading Panel (NRP) (2000) defined phonemic awareness as the capacity to concentrate on and manipulate phonemes in expressed words. The NRP (2003) report states,

> Phonemes are the smallest units constituting spoken language. English consists of about 41 phonemes. Phonemes combine to form syllables and words. A few words have only one phoneme, such as "a" or "oh." Most words consist of a blend of phonemes, such as "go," with two phonemes, "check," with three phonemes, or "stop," with four phonemes. Phonemes are different from graphemes, which are units of written language and represent phonemes in the spellings of words. (p. 2)

The NRP (2000) further clarified that phonemic awareness instruction should not be confused with phonics instruction, which is the instruction of letter sounds with their correlating graphemes, or letters. Simply defined, phonemic awareness is the sound, and phonics is the print of our alphabet. Knowing that literacy instruction can impact the reading outcomes of students, especially those most at risk, is encouraging information. Research has indicated that phonemic awareness is not only a predictor for early reading success, it is also most often the missing component of struggling readers (Adams, 1990). Phonemic awareness has been identified as an essential component in reading development that, if implemented properly, can improve the reading achievement of children.

**Conceptual Framework and Background**

The participating school district is referred to as the River Bluffs School District, a small urban school district in Missouri with a student population that fluctuates around 11,400 students. River Bluffs School District encompasses three high schools, four middle schools, and 16 elementary schools, with additional schools for alternative placements and technical training. Missouri's Department of Elementary and Secondary Education (DESE) Comprehensive Data System and 2011 District Report Card revealed that the composition of the River Bluffs School District was as follows: 83.2% White, 9.7% Black, and 5.8% Hispanic, and 1.3% other. Of the district student enrollment, 55.7% of students met the qualifications for free and reduced lunch. The River Bluffs School District had an average mobility rate of 27.03%, with the highest mobility among the elementary schools ranging from 48.38% to 56.63%. The 16 elementary schools included three high (less than 35% free and reduced lunch) socio-economic status (SES) schools, five middle (between 35% and 70%) SES schools, and eight low (more than 70% free and reduced lunch) SES schools (DESE, 2011). The elementary school sizes ranged from 290 students per building to over 500 students per building (DESE, 2011).

The River Bluffs School District's Curriculum, Instruction, and Assessment Department were concerned with data suggesting poor reading achievement for primary students. Evidence of a learning gap between high SES and low SES schools began to emerge as students eligible for free or reduced lunch, while poverty continued to rise. Knowing that reading achievement did not align to the district's standards along with the research of the NRP (2000), curriculum directors in the River Bluffs School District recognized that new reading instructional approaches were necessary. In 2009, three

pilot schools were selected to implement phonemic awareness instruction. In 2010, implementation of phonemic awareness instruction and interventions were implemented district-wide.

**Statement of the Problem**

School districts today are consistently facing more accountability as well as repercussions for not making adequate yearly progress according to No Child Left Behind. As districts strive to meet the needs of their students, particularly those from poverty, researching the effectiveness of current instructional practices, pilot programs, and curriculums is necessary.

Despite dedicating many hours of professional development on reading instructional practices, the River Bluffs School District was not satisfied with reading achievement in primary grades. Ultimately, district leaders recognized the role of phonemic awareness instruction in reading achievement, and therefore, began the arduous process of implementing an entirely new way to address literacy instruction in the district. Phonemic awareness, a newly implemented reading component in reading instruction, had yet to be evaluated for its impact on reading growth in the River Bluffs School District for students in kindergarten through second grade. As the district moved closer to implementing each of the five reading components outlined in the NRP (2000) report, reading growth was analyzed. The five reading components include instruction in phonemic awareness, phonics, fluency, vocabulary, and comprehension (NRP, 2000). In order to remain responsible fiscal stewards of public funds, the River Bluffs School District needed to assess the use of professional development, the reading growth of its students, the use of its resources, and its staffing in terms of phonemic awareness instruction and reading improvement.

**Purpose Statement**

The purpose of this study was to analyze the growth of reading scores for children in kindergarten through second grade after district-wide implementation of phonemic awareness instruction. In addition, the impact of phonemic awareness instruction on reading growth between high and low SES schools on reading growth first-year implementers compared to second-year implementers were examined. Reading growth, as measured by the Text Reading Comprehension (TRC) reading assessment, was determined by examining data at three testing times, once at the beginning of the year, once in the middle of the year, and once at the end of the year.

**Significance of the Study**

This study's significance was two-fold: first, it contributed to the research on phonemic awareness and its effectiveness in reading instruction, and secondly, it provided information important to River Bluffs School District and the Superintendent's council. This data were a central component in the council's fiscal decisions. The Superintendent's Council includes the Superintendent, the director of human resources, the director of curriculum, instruction, and assessment, chief operating officer, chief financial officer, and director of special services. The decision to implement phonemic awareness instruction impacted the responsibilities of every member of the superintendent's council. Each of the steps necessary to launch phonemic awareness instruction in the River Bluffs School District, from implementing professional development, updating curriculum, purchasing assessment hardware and software, and hiring interventionists involved every member of the superintendent's council. This study provided vital information for the future implementation of phonemic awareness instruction and phonemic awareness interventions for primary classrooms in the River

Bluffs School District. In addition, the study provided information about the district's implementation of phonemic awareness instruction for students of all SES backgrounds as well as provided information on the effectiveness of phonemic awareness instruction for schools at various levels of implementation.

**Delimitations**

The following are delimitations identified for the study:

1. Participants were public elementary school students in kindergarten through second grade. The schools were part of a small urban school district located in the Midwest.
2. The researcher used data from the 2010-2011 school year.
3. The researcher utilized TRC scores for students who had completed all three reading assessment data points: beginning of year, middle of year, and end of year, thus, excluding the scores of mobile and transient students.
4. Aggregate school SES was used rather than each student's SES status.

**Assumptions**

The following assumptions were made in this study:

1. The Text Reading Comprehension (TRC) assessment is a valid and reliable system of assessment to measure student reading levels.
2. Principals and teachers submitted the correct information into the TRC database for the assessment department.
3. Implementation fidelity was effective in all schools as directed by the building principals and district-level directors.

4. Data were accurately reorganized in a Microsoft Excel document by both the River Bluffs School District assessment department and the researcher.

**Research Questions**

1. To what extent does phonemic awareness instruction impact the growth in kindergarten students' TRC scores across three designated data points?
2. To what extent does phonemic awareness instruction impact the growth in first grade students' TRC scores across three designated data points?
3. To what extent does phonemic awareness instruction impact the growth in second grade students' TRC scores across three designated data points?
4. To what extent is there a difference in the change in reading growth in kindergarten TRC scores, between identified high SES and low SES schools?
5. To what extent is there a difference in the change in reading growth in first grade TRC scores between identified high SES and low SES schools?
6. To what extent is there a difference in the change in reading growth in second grade TRC scores between identified high SES and low SES schools?
7. To what extent is there a difference in the reading growth of kindergarten TRC scores between students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year implementers of phonemic awareness instruction?
8. To what extent is there a difference in the reading growth of first grade TRC scores between students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year implementers of phonemic awareness instruction?

9. To what extent is there a difference in the reading growth of second grade TRC scores between students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year implementers of phonemic awareness instruction?

**Definition of Terms**

The following are definitions of key terms used throughout the study:

*Balanced Literacy.* Balanced literacy as defined by Fountas and Pinnell (1996), is a framework for classroom lesson plans that incorporate the use of, read-alouds, guided reading, shared reading, and independent reading and writing. Ravitch (2007) defines balanced literacy as

> an approach to reading instruction that emphasizes the primacy of constructing meaning from authentic texts while also including instruction in skills. Balanced literacy classes incorporate elements of whole-language instruction, such as the use of complete and authentic (as opposed to decodable or vocabulary-controlled) texts and the teaching of common sight words, as well as providing some instruction in phonics. Such classes employ diverse strategies, including reading aloud sessions, word walls, guided reading, and reading circles. Advocates laud the method because it relies primarily on teacher judgment and initiative. Critics note that balanced literacy programs retain the spirit of whole-language instruction while including enough phonics instruction to meet the requirements of state standards. (p. 27)

*Basals and Basal Readers*. "Textbooks with a controlled vocabulary used to teach beginning reading. Basal readers contain fiction and nonfiction, written in language that is appropriate for specific grade levels" (Ravavitch, 2007, p. 27). Harris and Hodges (1995) defined basals as "a collection of student texts and workbooks, teacher's manuals, and supplemental materials for developmental reading and sometimes writing instruction, used chiefly in the elementary and middle school grades" (p. 18).

*Comprehension.* Harris and Hodges defined comprehension as the "intentional thinking during which meaning is constructed through interactions between text and reader" (1995, p. 38).

*Fluency*. Fluency is the capability to read correctly and rapidly (Armbruster, Lehr, & Osborn, 2003).

*Grapheme*. Harris and Hodges (1995) defined graphemes as "A written or printed representation of a phoneme, as b for /b/ and oy for /oi/ in boy" (p. 101).

*No Child Left Behind*. Public Law 107-110, authorized January 8, 2002, states that No Child Left Behind (NCLB) is an act to close the success difference among subgroups (race, SES level, special education) with accountability and school choice to ensure all students receive an adequate education.

*Phoneme*. Ravitch (2007) defined phonemes as "Any minimal unit of sound that is used to distinguish between words in a language – that is, the vowels and consonants … that serve to distinguish words from one another in a language" (p. 167).

*Phonemic Awareness.* "Phonemic awareness is the ability to notice, think, and work with the individual sounds in spoken language. Before children learn to read print, they need to become aware of how the sounds in words work. They must understand that

words are made up of speech sounds or phonemes, which are the smallest parts of sound in the spoken word" (Armbruster, Lehr, & Osborn, 2003, p. 2).

*Phonics Instruction.* "Phonics instruction teaches children the relationship between the letters (graphemes) of written language and the individual sounds (phonemes) of spoken language" (Armbruster, Lehr, & Osborn, 2003, p. 12).

*Phonological Awareness*. "The term phonological awareness refers to the general appreciation of the sounds of speech as distinct from their meaning" (Snow, Burns, & Griffin, 1998, p. 51). Phonological awareness is when the knowledge that words can be separated into a system of phonemes (Snow, Burns, & Griffin, 1998). Phonological processing "refers to the many aspects of speech and language perception and production…such as perceiving, interpreting, storing (remembering), recalling or retrieving, and generating the speech sounds system of language" (Moats, 1994, p. 81).

*Read-Aloud*. A read-aloud is part of a reading lesson in which the teacher reads to students and students listen. The teacher may choose to verbally express his/her thinking and ask questions while reading the text (Fountas & Pinnell, 2001).

*Running Record.* "Running records are the observational notes made by the teacher about a student's oral reading ability. The teacher identifies the student's errors (or miscues) and documents the student's progress or problems. By looking at the running record, the teacher can analyze the type of reading and instruction that is best suited for the student" (Ravitch, 2007, p. 186).

*Socio-Economic Status (SES)*. Socio-economic status is referred to as the child's home and background and is classified into low, middle, or high based on the family's income (Ravitch, 2007).

*Sight Words/Sight Vocabulary.* Sight words/sight vocabulary are commonly used words that children memorize as a whole, without use of decoding strategies (Ravitch, 2007).

*Strategy*. Strategy is defined as a "… systematic plan, consciously adapted and monitored, to improve one's performance in learning" (Harris & Hodges, 1995, p. 244).

*Title I.* Title I is a "… federally funded program designed to improve the academic achievement of low-income students.…Funding is intended to supplement, not replace, state and district funds and is based on the number of low-income students in a school (generally those who are eligible for the free/reduced price meals program)" (Ravitch, 2007, p. 218). Title I provides federal funding and federal mandates for participating school districts.

*Text Reading Comprehension (TRC)*. TRC is a reading comprehension assessment used to measure reading text level and comprehension in primary students. The TRC combines running records with comprehension questions.

*Vocabulary*. Vocabulary is all the words in a given language, those that exist in dictionaries, words spoken and written, and words used by persons or groups (Harris & Hodges, 1995).

*Whole Language.* Whole language is a "… philosophy and teaching method that focuses on reading for meaning in context. In its purest form … whole language avoids linguistic analysis of any kind, such as phonics instruction, and instead stresses the importance of the wholeness of words and text" (Ravitch, 2007, p. 228-229).

**Overview of Methodology**

This study was a quantitative analysis of the dependent variable, student reading growth, using the Text Reading Comprehension (TRC) reading assessment as the measurement tool over three data points (beginning of year, middle of year, end of year). A purposive sampling of 3,375 student TRC scores was included in this study. The independent variables in this study were identified as the implementation of phonemic awareness instruction for students in kindergarten through second grade, the schools' test times, the students' SES status, and the length of time phonemic awareness instruction had been implemented. TRC data were obtained from the school district access to the mClass®, Reading 3D™ database. SES status and data as indicated by the percentage of students who met the requirements for free and reduced lunch were obtained from Missouri's Department of Elementary and Secondary Education (DESE).

The purpose of this study was to examine the growth of reading achievement following the implementation of phonemic awareness instruction. To examine the reading growth of kindergarten, first grade, and second grade students between beginning of year to middle of year, middle of year to end of year, and beginning of year to end of year, a one-factor Analysis (ANOVA) was conducted. Tukey's HSD (honestly significant difference) post hoc test was conducted as the follow-up for each of the ANOVAs. The differences between the means had to be greater than the critical value to be considered statistically different ($\alpha = .05$); the kindergarten critical value was 0.28, the first grade critical value was 0.54, and the second grade critical value was 0.62.

Secondly, this study examined the growth of reading achievement following the implementation of phonemic awareness instruction between low SES and high SES

students. Two-factor ANOVAs with one repeated measure and one between were utilized to examine the difference in growth between low SES and high SES kindergarten, first grade, and second grade students' reading growth between beginning of year to middle of year, middle of year to end of year, and beginning of year to end of year. Tukey's HSD post hoc was used to examine the reading growth between test time one and test time two, test time two and test time three, and test time one and test time three for students in kindergarten, first grade, and second grade between schools. The differences between the means had to be greater than the critical value to be considered statistically different ($\alpha = .05$); the kindergarten critical value was 0.68, the first grade critical value was 1.31, and the second grade critical value was 1.48.

Finally, this study examined the growth of reading achievement in schools with one year of phonemic awareness instruction implementation and two years of phonemic awareness instruction implementation. Two-factor ANOVAs were utilized to determine whether there were significant differences in students' reading achievement based on whether phonemic awareness instruction had been implemented one year or two years. The differences between the means had to greater than the critical value to be considered statistically different ($\alpha = .05$).

**Organization of the Study**

The first chapter provided an overview of this study, including the statement of the problem, the significance of the study, a rationale for the study, delimitations and assumptions, research questions, and an overview of the methodology used. Chapter two begins with an in-depth review of the theoretical foundation of reading instruction and provides a comprehensive, relevant, and historic look at reading instruction in America.

In addition, chapter two identifies various researchers, theorists, and scientists, along with their contribution to education and what we know about learning today. Chapter two continues with a description of bottom-up and top-down reading theories in which researchers argued about best practice in regards to traditional reading instruction methods and whole language. Chapter two concludes with the most recent reading instruction research. Chapter three details the methodology of the study. The results from the research questions identified in chapter one are reported in chapter four. Finally, chapter five concludes with summary findings, further implications of the results, and recommendations for potential research.

# Chapter Two

## Review of Literature

The work of today's most reputable researchers, the design of teaching strategies, the applications of our most effective teachers, the current status of the educational system, the degree of government funding, and the nature of political discourse in reading instruction are all grounded in the theories of learning and psychology dating back to 400 B.C. Tracy and Marrow (2006), define theory as "an explanation for phenomenon that is widely held by a large group of people" (p. 13). In order to weigh in with authority on educational decision-making related to policy, curriculum, or funding, educators need to be aware of the complex inner workings of theories which should guide or influence decisions. Often educators do not realize they are implementing opposing theories; thus, they are left wondering why their hard work and dedication are unsuccessful. When educators can coordinate their understandings of theories, they are better able to provide learning interventions for students and are more successful in meeting individual student needs.

### Top-Down Theorists

Many educators subscribe to the philosophy of education defined by top-down theorists (Marlow & Page, 2005). Top-down theorists are those that take a more constructivist approach to learning. The name *top-down* comes from the concept that constructivism focuses on developing higher-order thinking skills (such as comprehension or synthesizing) rather than beginning with bottom-up, lower order thinking skills (such as memorizing or identifying) (Smith, 2002). Constructivism is described by Marlowe and Page (2005), as the process of learning whereby students

construct, "create, invent, and develop their knowledge through questioning, investigating, and applying not through memorization or rote practice" (p. 7). Constructivism is associated with inquiry learning, hypothesis testing, problem-based learning, learning by doing, hands-on learning, and whole language. Constructivism continues to thrive today, focusing on social learning and other soft skills such as decision-making, collaboration, cooperation, and reasoning and is contrary to the methods of direct instruction found in Behaviorism (Tracey & Morrow, 2006).

The Associationism era provided a foundation for constructivist teaching concepts by establishing the knowledge for ideas such as schema and metacognition. John Locke was the leader of the Associationism era. Locke wrote about his theory, called Tabula Rasa, or Blank Tablet Theory (1894). Tabula Rasa suggested that people are born without any internal, innate knowledge and that students must be provided with background information to activate their schema. Teachers implement Associationism daily in their classrooms through the use of KWL charts, Venn diagrams, story mapping, metacognition (actively discerning about one's own thoughts), reading think-alouds, and comprehension strategies such as making connections (Tracey & Morrow, 2006). "…By the classical principals of association (contiguity, recency, and similarity) - we acquire concepts. We acquire categorical knowledge about the objects and events in our environment and about their forms, their uses, and their contexts…"(Adams, 1990, p. 198-199).

Instructional strategies related to Associationism are also interrelated to strategies indicative of Bartlett's (1932) Schema Theory, which proposes that experiences help one to remember. The Schema Theory (Bartlett 1932) and Metacognition (Flavell, 1976)

contributed to comprehension instruction today. Bartlett (1932) described schema as "an active organization of past reactions, or past experience" (p. 201). Anderson and Pearson (1984) described Schema Theory as the process of building meaning by attaching old information with new knowledge met in text, while Harris and Hodges (1995) define it as "a view that comprehension depends on integrating new knowledge with a network of prior knowledge" (p. 227).

Another important component of comprehension instruction is metacognition. The Metacognition Theory is the "awareness and knowledge of one's mental processes" (Harris & Hodges, 1995, p. 153). According to Hattie (2009), metacognitive strategies in the classroom indicate large effect sizes, including $d = 0.71$ on reading comprehension and an overall effect size of $d = 0.69$ scoring in the "zone of desired effects" meaning that the effects are representative of teaching strategies that have the greatest impact on learning. Both Associationism and Schema Theory established the work that supports comprehension strategies used in classrooms today.

Continuing the foundation for constructivist learning models is the Unfoldment Theory. Rousseau (1762) believed that learning should unfold naturally, hence, the name *unfoldment*. Rousseau argued that educators should take the child's lead regarding what it is he or she wanted to learn and that adults should intervene very little. Rousseau also argued that nature should be at the center of a child's educational experiences and that reading and writing instruction is best postponed until the child is ten to fifteen years old. Literacy centers and collaborative activities during independent reading time are both Unfoldment hallmarks. During the time period of 1782-1852, the term *natural* became associated with constructivism. Unfoldment provided the basis for whole language

theorists because they believed that children did not need to be explicitly taught skills. Instead, those theorists believed skills could be acquired naturally through exposure to high quality literature and literacy activities.

Influenced heavily by Rousseau, John Dewey developed inquiry and problem-based learning during the progressive era. More concerned with developing students in a democratic society than with student achievement, Dewey's work continues to influence the 21st century pedagogy used in classrooms today through the use of collaborative processes such as critical thinking, problem-based learning, and collaborative use of technology (Marlowe & Page, 2005). Dewey (1990) wrote about the more important purpose of education, going beyond achievement alone, as an education that should include the skills necessary for creativity and critical thinking. Dewey's work inspired the concept of student choice in reading and the utilization of real-world text to authentically comprehend, rather than teaching discrete skills in isolation.

Hattie (2009) conducted a meta-analysis of studies that examined student control over learning, inquiry teaching, and problem-based learning. By converting thousands of studies into effect sizes so results could be examined using a universal scale, Hattie determined that each strategy had small effects on learning. An effect size of $d = 1.0$ for all studies would mean a rate of improving learning by two to three years or 50 percent; ultimately, it was determined that any study which scored above 0.40 fell into the zone of desired effects (Hattie, 2009). Student control over learning had an effect size of $d = 0.04$, scoring low in "developmental effects." Inquiry-based teaching scored $d = 0.31$, and problem-based learning scored low with $d = 0.15$ (Hattie, 2009). Thus, some commonly used teaching strategies appeared to be less effective than theorized.

Still, Dewey's work in preparing students for a democratic society focused on developing skills in collaboration and reasoning, rather than focusing only on achievement scores. In regard to these soft skills, Hattie (2009) reported some positive effect sizes for students. Positive effect sizes were noted in the areas of increased critical thinking skills ($d$ = 1.02) and the actual application of knowledge ($d$ = 0.40) (Hattie, 2009). Hattie also noted that that constructivist teaching models were most effective at the elementary level and decreased as students progressed through school (Hattie, 2009). The conflicting results of achievement scores and constructivism caused schools to question what they deemed most important, academic achievement or building creative and critical thinking skills necessary beyond the schooling years. Dewey's work has been central to the argument driving the "reading wars" in deciding on whether or not education's main purpose is student achievement or preparing students for real-world experiences.

Other theorists driving the constructivist movement include Goodman and Goodman (1979) whose Psycholinguistic Theory is the study of links between psychology and language in terms of how humans acquire language, interpret language, and organize, store, and employ knowledge (Tracey & Morrow, 2006). From the Psycholinguistic movement came the concept of miscue analysis used today in running records. Miscues are errors during reading that are categorized as either syntactic errors (relating to the syntax of language); semantic errors (relating to the meaning of words); and graphophonic errors (cue errors in the visual patterns of words) (Clay, 1993). The Psycholinguistic Theory movement was vital to the use of running records, which

provide an assessment of text reading, widely used today to assess students and inform instruction for guided reading groups.

Frank Smith (1971) extended the work established in the Psycholinguistic Theory, solidifying the Whole Language Theory. Drawing from the Unfoldment Theory, Whole Language Theory is a philosophy about how children learn about literature and writing, in that reading is a natural process that should be authentic and social, shifting from a focus on text to an emphasis on how readers construct meaning (Goodman, 1986). While Goodman and Goodman (1979) felt that "learning to read is natural, just as learning to speak and listen is," they did not feel that learning to read was innate (p. 140). Goodman (1976) focused on the need for literacy instruction to teach strategies in comprehension and the believed that reading was a natural process.

Throughout the late 1970s and into the 1980s, various researchers debated the implementation of whole language and the phonics-based approach. In regards to achievement, Hattie (2009) found that whole language programs have little to no effect on reading achievement, including word recognition and comprehension. More specifically, studies found that students of low-socioeconomic status did consistently better with basal reader instruction than students who received whole language instruction; however, studies did report gains in students' attitudes towards reading in whole language programs (Hattie, 2009). Similarly, Hattie's findings regarding Dewey's constructivist teaching philosophies, indicated low effect sizes for achievement, but gains in attitude toward learning. In contrast to Goodman and Goodman, Jeanne Chall (1967) published a comprehensive look at reading methods, and found that phonics is more effective than whole-word methods. While the whole language methods indicated poor

results for academic achievement, the movement did have a positive impact on classrooms today; teachers are now more cognizant of using authentic or real text, and the instructors concentrate more on understanding literature rather than simply word calling the text.

Other theories of the constructivism era were the theories of literacy development, which were founded on Piaget's theory of cognitive development. Piaget, a developmental theorist often described as a constructivist, defined the Theory of Cognitive Development, which describes how children learn over time according to what is developmentally appropriate (Tracey & Morrow, 2006). According to Piaget and Inhelder (1969), the stages of child development are affected by each of the following factors: biological maturation, activity, social experiences, and equilibrium (the ability to cognitively balance when information dissonance occurs). Piaget and Inhelder (1969) established the concept of phases and allowed educators to assess students beyond their age but also by the developmental skills they had grasped. The notion that children traveled through stages of development allowed the education arena to recognize that phonemic awareness is best utilized in the primary grades.

In addition to Piaget and Inhelder's stages of cognitive development, Social Constructivism focuses on the social aspect of learning. Lev Vygotsky, one of the earliest researchers of social learning theories, is most well known for describing the zone of proximal development: "the discrepancy between a child's actual mental age and the level he reaches solving problems with assistance" (Vygotsky, 1986, p. 187). Disagreeing with Piaget,'s levels of cognitive development, Vygotsky stated, "only part of the child's development can be measured, which is far from the whole story" (1986, p.

187). Where Piaget proposed that development preceded learning, Vygotsky proposed that learning results from social interactions. Tracy and Morrow (2006) supported Vygotsky's beliefs as being valid noting, "Tasks that children can independently complete do not fall within the zone of proximal development and therefore, according to this theory, are not ideal for promoting children's development" (p. 109). The term *scaffolding*, "learning with the gradual withdrawal of adult/teacher support, as through instruction, modeling, questioning, feedback,…" (Harris & Hodges, 1995) is grounded on Vygotsky's zone of proximal development. Scaffolding is widely used today to describe the support designed in lesson plans for literacy instruction.

The final social learning theory is Critical Literacy Theory, a theory made widely known by Paul Freire (1970), who researched the ways social learning influenced the poor and undereducated people of Brazil. According to Tracey and Morrow (2006), Critical Literacy Theory examined the political aspects of literacy in terms of success and failures. Freire (1970) believed that the social aspect of dialogue is one of the most important components of learning in education. In fact, Freire was so successful in educating the illiterate citizens of Brazil that the government forced him into exile for his strong political and social beliefs in advocating for justice. His work is an example of how effective social learning is for impoverished students in education. The Social Learning Theory and the Critical Learning Theory provided the theoretical foundation for small-group instruction and could explain why phonemic awareness was most effective in small groups rather than in one-on-one instructional settings.

**Bottom-up Theorists**

In contrast to top-down theorists, bottom-up theorists concentrate on learning in discrete order before more complex tasks can be mastered, meaning students should learn low-level skills before higher order thinking skills (Marlow & Page, 2005). For example, bottom-up theorists believe that students should learn to identify their letters before they try to read words and before they try to comprehend meaning. Behaviorists such as Pavlov, Skinner, and Thorndike all influenced bottom-up theories. During Behaviorism, the focus of psychology shifted from the workings of the inner mind (unconscious, feelings, drives, impulses, and wishes) to observable behaviors that could be studied and explained (Smith, 2002). According to Skinner (1988), Behaviorism is the experimental analysis of behavior. Phonemic awareness instruction is often associated with bottom-up theorists because it concentrates on teaching smaller, discrete skills before reading words and text.

Providing the foundation for the direct instructional strategies found in Behaviorism is the Mental Discipline Theory, the view that the mind is a muscle that can be exercised and strengthened (Tracey & Morrow, 2006). Educators today implement the Mental Discipline Theory in their classrooms each day. Anytime a teacher asks a student to practice a skill or an objective, they are exercising the Mental Discipline Theory. Examples of Mental Discipline Theory include rereading passages, practicing mathematics facts, working with vocabulary, practicing sight words, writing spelling words, and reading silently. According to Snow, Burns, and Griffin (1998), the importance of practice is evident in research studies in a wide variety of areas affecting

children's reading achievement such as "oral language development, phonemic awareness, exposure to print, and experience with storybook reading" (p. 217).

Beginning the Behaviorism movement was Ivan Pavlov, who discovered the Classical Conditioning Theory when he noticed that his dogs salivated at the mere sight of their food bowl, even when there was no food in the bowl, is credited with beginning the Behaviorism movement. He later conditioned the dogs to salivate to other stimuli, including the sounding of a bell, hence the name Classical Conditioning. While Pavlov's work did not directly impact instructional practices in education, it did provide a foundation for the continuous practice of reinforcing behaviors.

Later, Edward L. Thorndike extended the theory of Classical Conditioning when he applied conditioning effects to the stimuli that occurred after a behavior. Thorndike believed that conditioning the stimuli would affect future behaviors (Tracey & Morrow, 2006). Thorndike (1913) proposed four laws: the Law of Effect, the Law of Readiness, the Law of Identical Elements, and the Law of Exercise. The Law of Effect, also known as the Principal of Reinforcement (Tracey & Morrow, 2006), is the concept whereby a response is met with a "satisfying state of affairs" strengthening the connection (Thorndike, 1913, p. 172). If, however, the responses are met with an "annoying state of affairs," the strength of the connection decreases (Thorndike, 1913, p. 172). The Law of Readiness is the basic concept that the body must be ready to respond to stimuli and must do so in order to create a connection. The Law of Identical Elements states that the more one set of situation and response is like another situation and response, the greater the connection, specifically in the areas of feelings and behavior, such as laughter and fear. The Law of Exercise is comprised of two components: the law of use and the law of

disuse. The Law of Exercise states that the longer something is used, such as the spelling of a word or a math fact, the greater chance the answer is correct, therefore, increasing the strength of connection. The law of disuse states that when there is an increase in time between uses there will be a decrease in strength of connection (Thorndike, 1913). Adams, (1990), adopted the connectivist framework because she felt that it best explains the data on human word recognition and performance. The Law of Exercise is related to the Mental Discipline Theory in that both theories support the concept of practice and repetition. Thorndike's four laws are representative of direct instruction in the classroom. The Law of Readiness represents phonemic awareness instruction because it explains the concept of beginning instruction with smaller and more basic concepts, such as sounds, before focusing on words, sentences, or meaning. The Law of Identical Elements explains the delay children of low SES often experience upon entering school. Some children from low socio-economic backgrounds lack experiences with rich literature and conversational vocabulary and are not as able to replicate and utilize grade level expectations in the areas of phonemic awareness, let alone vocabulary.

The final and third theory in Behaviorism is the Operant Conditioning Theory. B.F. Skinner developed the use of reinforcement and punishment schedules to change behavior. Skinner (1953) believed that the size and amount of reinforcement affect the rate and immediacy of responses. Behaviorism is dominant in education and classrooms today and is evident when teachers and computer programs/games alike build reinforcement into their instruction to praise children for correct answers. Phonemic awareness instruction utilizing computer programs/games has been shown to positively

affect student outcomes in reading and is just as effective as instruction given by the teacher (NRP, 2000).

In sharp contrast to Rousseau, who advocated the more constructivist Unfoldment Theory, Hattie (2009), discussed at length the benefits of direct instruction, indicative of Behaviorism in today's classrooms. Direct instruction was shown to have an effect size of $d = 0.59$, scoring in the "zone of desired effects."

The next phase of bottom-up instructional theories is the Stage Models of Reading, which began in the 1980s and helped define proficiency levels as we know them today (Tracy & Morrow, 2006). Educators began to express interest in stages or levels of reading that their students would go through as they read. Under the Stage Models of Reading, there is a common belief that as children mature they go through stages of reading development. The stages of Stage Model Theory are the following:

- Visual Cue Reading is the stage at which children use visual cues as their primary method of word recognition, such as memorizing words, using pictures, or identifying common restaurants and other logos;
- Alphabetic Stage is the stage in which children use phonetic cues to identify words; this stage includes finger pointing at words in predictable and patterned texts;
- Phonological Recoding Stage, also referred to as the, Orthographic Stage, is the stage in which students use automatic and fluent knowledge of letter-sound relationships and patterns, such as word families (Tracey & Morrow, 2006, p. 83.)

Stage Model theorists believed that as children's reading skills develop, children increase the amount of reading strategies they are able to employ while retaining the ones they have already mastered (Tracey & Morrow, 2006). Stage Model Theorists Ehri (1987), Chall (1967), Gough (1996), Juel (1998), and Griffin (1998) have all influenced the beliefs in Stage Model of Reading Theory and have noted the importance of phonological awareness/instruction in the classroom. Phonemic awareness and phonics-based instruction are most commonly associated with bottom-up theorists due to the student's need to master lower-order thinking skills (e.g., letter identification, memorization of sounds) before mastering higher order thinking skills (e.g., metacognition, comprehension of a story). In the 1940s, teachers began to differentiate phonemic awareness instruction and phonics instruction, calling it auditory discrimination (phonemic awareness) and visual discrimination (phonics) (Smith, 2002). The Stage Model Theory helped educators understand the progression of skills in acquiring the knowledge to read and could begin applying the skills at the earliest of grade levels.

**Ecologically Balanced Approach**

As researchers, theorists, and educators began to utilize science to discover how students acquired knowledge in learning to read and recognized the multiple components to reading, an ecologically balanced approach to reading emerged (Smith, 2002). The balanced approach to reading acknowledged that a reader may carry out lower-order thinking skills (e.g., discrete skills in letter recognition and sound) along with higher-order thinking skills (e.g., skills in comprehension and metacognition). At a time when school districts were trying to decide whether they could compromise their constructivist

principles in order to implement instruction that most effectively increased student achievement, the balanced approach to reading provided an opportunity to blend authentic literature, social learning, with direct instruction (Smith, 2002). The balanced approach emerged in the same time period that the term phonemic awareness began to dominate the literacy circles. Phonemic awareness throughout the 1950s through the 1990s was studied in much more detail.

Perhaps the most recent and influential research associated with phonemic awareness was from Information/Cognitive Processing Perspectives theories that emerged in the 1950s. In the information/Cognitive Processing Perspectives, the bottom-up (lower order to higher order thinking stages) theory of reading was examined, and research on orthographic (word) and phonological (sound) processors was further developed. The Information/Cognitive Processing Perspectives era was known as the time when scientists and researchers, similar to Behaviorists, shifted their studies from observable behaviors (such as reading miscues), to the cognitive processes during reading (how the brain processes print and speech). Thus, the connection between phonemic awareness and phonics was evident.

Later, Philip Gough developed the bottom-up model of information processing, which became known as the Gough Model. The Gough Model is the mental progression of reading as a linear progression from lower-order thinking skills (e.g., decoding) to higher-order thinking skills (e.g., comprehension) in a series of discrete stages. Similarly, in 1974, the Automatic Information Processing Model (LeBerge & Samuels, 1974) represented another bottom-up model in which readers follow five basic components: visual memory (graphic input from text), phonological memory (sounds attached to

visual cues), episodic memory (context of information), semantic memory (other knowledge), and attention (Tracy & Morrow, 2006). The difference between the Gough Model and the Automatic Information Processing Model is that in the Automatic Information Processing Model the beginning reader comprehends by switching attention back and forth between decoding and comprehension, while the Gough Model is a linear reading process completed in order of discrete stages without switching attention back and forth. Later, in 1977, David Rumelhart expanded on the bottom-up theories by constructing the Interactive Model. In Rumelhart's model the cognitive process was not linear as in the Gough Model; instead, the Interactive Model converged simultaneously from the top and the bottom. Rumelhart's (1977) expansion represented his belief that higher level processing (comprehension) can help in identifying lower level (word identification) processing and vice versa.

Continuing the trend to seek and describe how the mind processes during reading, researchers in the 1980s brought the phonological core to the forefront. Research on the phonological core began in 1988 when Keith Stanovich published the Interactive Compensatory Model. Stanovich compared the works of bottom-up theorists with the works of top-down theorists. Stanovich (1980) concluded that processing is simultaneous and that neither bottom-up alone nor top-down alone described what is cognitively taking place during reading. Based on this conclusion, Stanovich (1980) stated that reading is not only linear (The Gough Model) or interactive (Rumelhart's Model), but it was also compensatory, meaning that when one processor was not working (orthographic, phonological) another would compensate the reader to make meaning. For example, if an individual were trying to read a blurred message, several processors (orthographic, or the

symbols seen by the reader, and phonological, the rules for speech) would assist the individual to aid comprehension. In the same year, Ehri (1980) focused on the orthographic processors, or the visual and printed text, and how words are captured into memory. Ehri's work has become known as the Orthographic Processing Perspective, which introduced such terms as *decoding* and *sounding out* into elementary teachers' everyday vocabulary. In 1988, Stanovich developed another model called the Phonological-Core Variable Difference Model. Stanovich's work, which stemmed from researching the causes of dyslexia in individuals, claimed that dyslexia was a result of a phonological processing deficit. According to Stanovich (1988), children with phonemic awareness deficits are slower to break the sound-symbol code of reading, which delays all other processes of decoding as well as delaying exposure to reading, causing fewer opportunities to practice reading, and, therefore, compounding problems so that phonological deficits materialize as cognitive disabilities. Stanovich (1986) described how phonemic awareness contributed to the fact that proficient readers continued to develop while the lack of phonemic awareness allowed poor readers to continue to struggle and sometimes regress.

Researchers in the 1990s introduced a body of knowledge that synthesized research into a comprehensive approach to reading instruction. Adams (1990) described the Parallel Distributed Processing Model and the four primary processors in the brain: orthographic processor (print); phonological processor (speech); meaning processor (vocabulary); and context processor (in which the reader constructs and monitors meaning). In this model, Adams (1990) outlined the components of reading instruction

as we know them today: phonemic awareness, phonics, vocabulary, fluency, and comprehension.

Continuing Stanovich's work, Wolf and Bowers (1999) found Stanovich's view of phonological deficiencies as the primary cause of reading disabilities to be incomplete. As a result, they proposed the Double-Deficit Hypothesis, which states that children also suffer from deficits in rapid-naming skills in which they are less able to identify colors, to rapidly name objects, or rapidly name letters and numbers. Wolf and Bowers (1999) believed that children fall into one of the following categories: phonological deficient, rapid-naming deficient, or both phonological and naming-speed deficient. Children having both phonological and naming speed deficiencies have the most severe debilities and are referred to as double deficit learners.

From the works of Plato to the research of Stanovich (1980) and Ehri (1980), reading theory and instructional philosophies have spanned the spectrum. Adams (1990) and Chall (1967) bridged the top-down and bottom-up spectrum by communicating and creating a balanced approach to literacy through their synthesized works (Justice & Kaderavek, 2004). This balance is best described by Morrow and Gambrell (2011) "Today, we must recognize that balance is not an external construct achieved by coordinating phonics and whole language components. Rather, achieving balance is a complex process that requires flexibility and artful orchestration of literacy's various contextual and conceptual aspects" (p. 40).

In the mid-1990s, the discourse of literacy research shifted from a whole language qualitative, interpretive research to a more scientifically-based research from the National Institute for Child Health and Human Development (Smith, 2002). From the

scientifically based research during this time, two themes emerged: phonemic awareness and phonics instruction. More importantly, tremendous amounts of research suggested that phonemic awareness is a critical piece of reading success (Smith, 2002).

Smith (2000) supported a balanced approach because it respects the wisdom of both practices and, due to the differences in student success, background, and ability, teachers need a toolbox full of various educational practices. Irene Fountas and Gay Su Pinnell (1996) referred to this framework of instruction as balanced literacy because whole language principles and attention to explicit skills allowed the teacher to initiate indirect instruction (facilitator) and provide direct instruction (instructor).

To summarize, each of these theories, theorists, and scientists contributed to what is known as reading instruction today. It is illogical that any one theory accurately described how literacy instruction should be administered (Woolfold, 1998); for this reason it is important to consider the strengths and weakness of each theory before it is rejected or accepted by school districts. However, the research presented during the balanced literacy era gave educators who are constructivist in nature permission to implement key components of reading development in their daily instruction, such as direct instruction in phonemic awareness and phonics.

**Present Day**

While the reading debate continued, in 2000, the National Reading Panel (NRP) published its meta-analysis of over 100,000 studies on reading instruction. In this meta-analysis, five areas of reading instruction were researched and discussed: phonemic awareness, phonics, fluency, vocabulary, and text comprehension. According to the NRP, incorporating all five components in classroom instruction is hailed as evidence-based

reading instruction grounded on the scientific research of literature on reading. Snow, Burns, and Griffin (1998) discussed many factors that contributed to reading. The five factors of adequate initial reading instruction required that children use reading to obtain meaning from print; have frequent and intensive opportunities to read; are exposed to frequent, regular spelling-sound relationships; learn about the nature of the alphabetic writing system, and understand the structure of spoken words.

In order to replicate how successful children learn to read, Adams (1990) studied what it is that proficient readers do: employ the complex relationship of orthographic, phonological, meaning and context processors working together. The connectionist framework was adopted throughout Adams's book because she believed that the framework best explained the data on human word recognition.

The works of Adams (1990), Snow, Burns, Griffin (1998) and the NRP (2000) are referred to often because the authors have been dedicated to researching reading instructional strategies and philosophies that are most effective in teaching children to read. These authors took neither side of the reading debate and were often criticized from both top-down and bottom-up theorists. As a result, for the purpose of this study, the aforementioned researchers were referenced to aid in the analysis of the impact of phonemic awareness instruction in the River Bluff School District and not to further debate the value of phonics in American schools today.

**Phonemic Awareness.**

Phonemic awareness is the awareness of sounds (phonemes) that make up a spoken word (Harris & Hodges, 1995, p. 185). Although some researchers noted in 1940 that students with reading disabilities could not distinguish the sounds in spoken words or

put sounds together, phonemic awareness did not gain attention until after Stanovich's identification of phonological deficits as a central factor for students with reading difficulties (Tracey & Morrow, 2006). Chall (1979) described phonemic awareness in the prereading stage, the stage at which children birth to six years old begin to notice that spoken words may be segmented, that parts may be added to other words, that some parts sound the same, and that some parts can be blended to form whole words. Marie Clay (1993), well known for her development of Reading Recovery, found in 1979 that many six-year-olds were not sufficiently learning to read or making adequate progress also seemed not to hear the order of sounds in words. Clay (1993) implemented a speech training program developed by a Russian psychologist, Elkonin (1973), to teach children how to manipulate sounds. This training required students to separate words into sound boxes, called Elkonin Boxes. For example, the word *boat* would be divided into boxes as follows, /b/, /oa/, /t/ (Clay, 1993).

Researchers throughout the 1960s and 1970s hinted at the important relationship between sound awareness and learning to read, (IRA, 1998) but it was not until 1990, when Adam's book was published, that phonemic awareness was widely accepted and researched, up until this point phonemic awareness instruction was not seen as a necessary component for classroom instruction. The NRP increased the attentiveness to phonemic awareness when it published its meta-analysis on scientifically-based reading instruction in 2000, crediting phonemic awareness as one of the five components of a scientifically-based reading approach.

Phonemic awareness is the ability to manipulate and recognize letter sounds and should not be confused with phonics, which is the letter-sound correspondence and

spelling patterns (NRP, 2000). Praised for her work in researching reading development in the area of phonemic awareness, Adams (1990) helped bring phonemic awareness to light when she summarized phonemic awareness in five different levels:

1. The most primitive level is measured by knowledge of nursery rhymes and involves nothing more than the child having an ear for the sounds of words.
2. At the next level, oddity tasks require the child to methodically compare and contrast the sounds of words for rhyme or alliteration; this task requires not just sensitivity to similarities and differences in the overall sounds of words but also the ability to focus attention on the components of the sounds that make the words similar or different.
3. The task at the third level, blending and syllable-splitting, requires that the child has a comfortable familiarity with the notion that words can be subdivided into those small, meaningless sounds corresponding to phonemes and, secondly, that she or he be comfortably familiar with the way phonemes sound when produced in isolation and, better yet, with the act producing the phonemes by oneself.
4. The phonemic segmentation task require not only that the child has a thorough understanding that words can be completely analyzed into a series of phonemes but further that she or he be able to analyze them into a series of phonemes, completely and on demand.
5. The phoneme manipulation task requires still further that the child has sufficient proficiency with the phonemic structure of words and that she or he

> be able to add, delete, or move any designated phoneme and regenerate a word (or a nonword) from the result (Adams, 1990, p. 80).

Also, bringing phonemic awareness to the forefront was Chall (1967) and the work of Bond and Dykstra's data analysis of United States Office of Education (USOE) Cooperative Studies, when they identified letter naming as the single best predictor of reading success and phonemic awareness as a close second. To help clarify what was most essential in phonemic awareness instruction, Adams (1990) noted that it is a student's ability to manipulate sounds that matters most and that, regardless of the instructional approach, the two predictors (letter naming and phonemic awareness) were still proven most effective. Many may question why phonemic awareness is such a problem or issue for children. After all, babies can already differentiate the letters they hear in sounds such as /ba/ and /pa/ (Adams, 1990). The problem is, in order to read an alphabetic script, a prereader must have working knowledge of what humans have learned not to attend to, simple sounds, but must master in order to read text (Adams, 1990). To facilitate attending to what we have learned not to attend to and to create better assessments for phonemic awareness, Adams divided the similarities and differences in phonemic awareness into six categories:

- phonemic segmentation tasks: for example, mat into /m/, /a/, /t/ (p. 68);
- phoneme manipulation tasks: for example, a child may be asked to pronounce hill without the /h/, monkey without the /k/, or nest without the /s/ (p. 71);
- syllable-splitting tasks: for example, the instructor says "bear" and the student says "b-b-b" (p. 72);

- blending tasks: for example, the instructor would say, "/m/…/a/…/p/" and ask the student to put the sounds together, to create "map" (p. 75);
- oddity tasks: for example, finding the first sound, final sound, or middle sound in a given word (p. 78); and
- knowledge of nursery rhymes (p. 79).

The assessment of phonemic awareness generally consists of students isolating or segmenting the phonemes verbally spoken, to blend a sequence of sounds into a word, or to exchange the sounds (phonemes) within a word with other sounds (phonemes) (Snow, Burns, & Griffin, 1998).

Research from the National Reading Panel, in conjunction with the National Institute of Child Health and Human Development, suggested that phonemic awareness instruction had a positive influence on reading outcomes. The overall effect size for phonemic awareness outcomes was large, $d = 0.86$; the results were moderate for reading outcomes and spelling outcomes, 0.53 and 0.59 respectively (NRP, 2000). Immediate post-tests for phonemic awareness instruction outcomes had an effect size of $d = 0.86$. To determine if students could retain skills in phonemic awareness, follow-up studies were conducted. Effect size on follow-up reports ($d = 0.73$) indicated significant gains in children's ability to read words and pseudowords as well as children's reading comprehension, and showed that phonemic awareness instruction was highly effective within all literacy areas and results (NRP, 2000).

Phonemic awareness instruction was separated and studied in four categories: Segmentation, Blending, Deletion, and Other. Segmentation, or identifying separate sounds in words, was shown to have a mean effect size of 0.87. Blending, the

combination of sounds together, was shown to have a mean effect size of 0.61. Deletion, identifying what a word would be without a letter, was shown to have a mean effect size of 0.82. The NRP (2000) gave this example of deletion: "What is the word smile without the /s/?" Lastly, all other instruction that did not include segmentation, blending, or deletion had an effect size of 0.72 (NRP, 2000).

While all instructional settings were effective, the NRP (2000) concluded that small group instruction yielded the highest effect sizes for phonemic awareness instruction outcomes ($d$ = 1.38). One-on-one instruction was shown to have a mean effect size of 0.60 and whole-classroom instruction resulted in a mean effect size of 0.67. Outcomes in instructional settings for phonemic awareness supported delivering whole group and small group instruction for children, rather than focusing on an individual child during a tutoring or conferencing session. This was encouraging information given that teachers can be more effective with more children instead of utilizing intensive amounts of time on one child.

The NRP (2000) also reported the mean effect sizes of length of training. Again, encouraging information for teachers was reported. The information was encouraging because the outcomes reported on length of training indicated that more was not necessarily better. Students receiving 5 to 9.3 hours of training and students receiving 10 to 18 hours of training reported the highest effect sizes of 1.37 and 1.14, respectively. While all lengths of training were effective, students receiving one to 4.5 hours ($d$ = 0.61) and 20 to 75 hours ($d$ = 0.65) did not make as much progress.

Another study conducted by the NRP (2000) examined the effect size of the trainer. The trainer is defined as either the classroom teacher, researchers in the field of

phonemic awareness, or the computer. The highest mean effect sizes were gained from researchers and others (e.g., non-teachers) conducting instruction ($d$ = 0.94); however, classroom teachers ($d$ = 0.78) and computers ($d$ = 0.66) were also effective in phonemic awareness instruction.

Next, the NRP (2000) studied the participants, or student groups, of phonemic awareness instruction to determine which group of students had the highest outcomes. Phonemic awareness instruction had the greatest results for children at risk of reading below grade level ($d$ = 0.95) and for normally progressing students ($d$ = 0.93). It was not as successful for readers diagnosed as disabled ($d$ = 0.62).

Finally, the NRP (2000) reported outcomes by grade level. Phonemic awareness instruction had the greatest effects for preschool children with a mean effect size of 2.73 and for kindergarten students with a mean effect size of 0.95. It was found least effective for first grade students with a mean effect size of 0.48 and was found more effective for second through sixth graders with a mean effect size of 0.70. The National Reading Panel suggested that the reason first graders may have lower effect sizes for phonemic awareness as a two-fold problem: (a) some first graders may be nonreaders, in which case they have little to no phonemic awareness and limited ability to perform advanced levels of phonemic awareness manipulations; (b) some first graders were already reading and writing and, therefore, showed little growth in phonemic awareness effect sizes (2000). However, as the NRP, reported, phonemic awareness instruction was still beneficial to all students (2000).

It is important to note that while few in the reading community outright disagreed with the conclusions of the NRP, some researchers argued with the way in which the

phonemic awareness instruction was delivered and with the way data were collected (Hattie, 2009). For example, Krashen (2004) suggested that the methods used in the NRP meta-analysis embedded phonics instruction within the instruction of phonemic awareness and, therefore, did not find the impact of the phonemic awareness results valid. Similarly, Adams (1990) described the development of phonemic awareness as often slow and difficult. She stated that children who begin to read without the knowledge of phonemic awareness could successfully learn to read developing phonemic awareness alongside their word recognition skills. However, children struggling to read always seemed deficient in phonemic awareness skills (Adams, 1990). Adams further noted that phonemic awareness had remarkably strong correlations and was a strong predictor for beginning reading acquisition (1990). In conclusion, it is imperative that school districts understand that phonemic awareness instruction is not a reading program alone; instead, it must be implemented with other literacy instruction strategies. It must also be accepted that phonemic awareness instruction, while an accurate predictor for future reading success, is not a prerequisite in learning to read.

**Phonics**.

Like phonemic awareness, phonics is much debated throughout the history of literacy instruction in America. Phonics is the "relationship between the letters (graphemes) of written language and the individual sounds (phonemes) of spoken language" (NRP, 2003, p. 12). Rudolf Flesch brought phonics to the forefront of education in 1955. However, Flesch's work was widely dismissed by educational research journals at the time due to some of his outrageous and unproven claims (Beck & Juel 1995). Perhaps Flesch's work would have been more widely accepted if it had not

been for his conspiracy theories, racial comments, and sexist beliefs (Adams, 1990). In 1967, Chall presented her research on the benefits of phonics instruction, which surprised many; Chall herself did not realize how important phonics instruction was in learning to read. Chall's research was widely accepted by the reading community and prompted additional research in the area of phonics instruction (Adams, 1990).

Further supporting phonics instruction, Snow, et al. (1998) classified phonics into three main approaches: whole language, embedded phonics, and direct code. These researchers concluded that a relatively large percentage of children who received whole-language and embedded phonics instruction exhibited no measurable gains in word reading over the school year; however, students who received direct code instruction showed growth in word reading that appeared more or less normally distributed.

Both the NRP (2000) and Hattie (2009) advocated the use of phonics instruction, citing positive effects for phonological outcomes, reading outcomes, and for spelling. Findings provided a concrete basis for systematic phonics instruction in order to positively impact children's growth in reading opposed to other programs delivering incidental or no phonics instruction (NRP, 2000). Hattie (2009) supported the NRP results on phonics instruction and reported phonics instruction in the highest zone of effects ($d = 0.60$). Hattie (2009) stated that phonics instruction was an effective way to improve word recall and reading comprehension.

While many disagreed with the National Reading Panel's findings due to the limited research pool, many other researchers have found similar results. In 1967, Chall found that there were considerable advantages for programs that incorporated systematic phonics and found that the advantages of systematic phonics were just as valuable (if not

more so) for children from low SES families or those with considerably fewer abilities in the primary grades as it was for more able and advantaged children. In 1990, Adams determined that explicitly teaching phonics was representative of quality reading instruction. Snow, et al. (2009) noted that while Chall did not intend for her book to endorse phonics instruction, it has been widely supported by proponents of phonics. In 1985, Anderson, Heibert, Elfreda, Scott and Wilkerson concluded that there was no longer the issue of whether or not children should be taught phonics; instead; the issue is how the teaching of phonics should be carried out. In phonics instruction, isolating sounds in text, offers an advantage when implemented in moderation and when incorporating good blending instruction (Beck & Juel, 1995).

**Fluency.**

A third component, fluency instruction, is another essential component to reading, according to the NRP (2000), is fluency, the act of reading with speed and accuracy. National Assessment of Educational Progress (NAEP, 2011) reported that 44 percent of fourth grade students did not display fluent reading behaviors with grade-level text (2011). The study also concluded that a close connection among fluency and reading comprehension existed, reporting that students that exhibited poor fluency could have difficulty comprehending. Concurring with the NRP (2000), Snow, et al., (1998) recommended fluency instruction, as a necessary factor in word recognition and appropriate reading speed so as not to interfere with comprehension.

The National Reading Panel researched two main methods for teaching reading fluency: repeated oral readings and increased independent reading/sustained silent reading. The National Reading Panel report indicated that guided oral reading had a

moderate impact on reading achievement, therefore, having a moderate impact on reading achievement. Hattie (2009) defined repeated reading programs as programs that required students to reread passages to improve timing. Hattie (2009) concurred with the findings of the National Reading Panel and categorized repeated reading programs to be the most effective ($d = 0.67$).

**Vocabulary**.

A fourth component of reading is vocabulary. Beck, McKeown, and Kucan (2002) defined vocabulary instruction as teaching information about words and word uses to increase comprehension and enhance language skills. According to the NRP (2000), the significance of vocabulary on reading success has been acknowledged for more than 50 years. Hattie (2009) stated that a mean effect size of $d = 0.97$ suggested that students who participated in vocabulary instruction had substantial gains in reading comprehension when given passages containing words previously taught. According to Hattie (2009) vocabulary programs had an effect size $d = 0.67$.

While it is widely agreed that vocabulary instruction is vital to comprehension and reading achievement, researchers concur that there is no one way to teach vocabulary. Unlike phonics, where researchers could not decide whether indirect or explicit/direct instruction was the best mode for learning, researchers agreed that multiple (indirect and explicit/direct instruction) strategies for teaching vocabulary were most effective (Beck, et al., (2002). Hattie (2009) proposed that the most successful vocabulary instruction techniques include both definitional (explicit) and contextual (indirect) information.

Stahl and Fairbank's (1986) research found the following: vocabulary instruction does result in increased word knowledge; vocabulary instruction results in increased

comprehension; and the most effective types of vocabulary instruction consisted of both information about word definitions and examples of words in context. These findings supported the National Reading Panel's (2000) and Beck, et al. (2002) conclusions which stated that vocabulary ought be explained directly and indirectly and that it is a necessary component of reading instruction.

**Comprehension.**

The fifth component of scientifically-based reading research, according to the National Reading Panel (2000), is comprehension. Text comprehension instruction is defined as the purpose for reading, or to understand what one is reading (NRP, 2003). Adams (1990) described comprehension as a hierarchy: at the lower levels, a reader must decode and read words, and at the higher levels a reader must interpret the words into one collective piece of reading in order to make meaning.

While the reading community has agreed that teaching comprehension strategies has positive impacts on reading achievement and should be taught, there is still little agreement on what exactly those comprehension strategies are. According to the NRP (2000) there are seven strategies for comprehension instruction that have firm scientific value: "comprehension monitoring, cooperative learning, graphic and semantic organizers including story maps, question answering, questions generation, and summarization" (p. 4). Hattie (2009) reported that teaching comprehension strategies was an effective way to raise student achievement with an effect size of 0.58. However, Hattie (2009) identified an effective yet different list of comprehension strategies, including the following: visually dependent strategies, concept-oriented strategies, inference, questioning during reading, summarizing, and monitoring comprehension.

Drawing on schema theory, Keene and Zimmermann (1997) listed meta-cognitive comprehension strategies as "activating prior knowledge, determining importance, creating visual and other sensory images, drawing inferences, retelling or synthesizing, and fix-up strategies" (p. 22-23). Zemelman, Daniels, and Hyde (2005) clearly stated that teachers should, in a developmentally appropriate way, teach students the strategies to actively visualize, question, connect, predict, and evaluate in collaborative ways. Snow et al. (1998) reported large effect sizes for comprehension strategies such as meta-cognition, self-questioning, identifying text consistencies, and reciprocal teaching. Baker (1998) claimed that it was unclear whether explicit instruction or implicit learning provided the greatest influence to student achievement. What was clear, according to Snow, et al. (1998), was that, during the primary grades, reading instruction should incorporate direct instruction on "summarizing the main idea, predicting events or information to which the text is leading, drawing inferences, and monitoring for misunderstandings, in order to comprehend" (p. 195).

**Socio-economic Status and Other Risk Factors of Reading Achievement**

Countless research has indicated that a child's socio-economic status (SES) has a large effect size on student reading outcomes and achievement in the United States (Hart & Risley, 1995, Hattie, 2009, 1995; NRP, 2000). Hattie (2009) described SES as relating to an individual's relative position in the social hierarchy as it related to the resources in the home, including parental income, parental education, and parental occupation (Hattie, 2009). Generally speaking, the SES of schools and communities as well as how Title I funds are allocated is calculated by the percentage of children who met the qualifications for free and reduced lunch in school.

Low SES risk factors originate from a multitude of influences including homelessness and receiving less than adequate nutrition, prenatal care, pediatric care, and mental health care. In addition, Snow, Burns, and Griffin (1998) described chronically low-achieving schools as a risk factor for students. These researchers defined chronically low-performing schools as schools with "low rates of on-task time, less teacher preparation of new material, lower rates of teacher communication of high expectations, fewer instances of positive reinforcement, more classroom interruptions, more discipline problems, and an unfriendly classroom ambiance" (p. 129). Individual risk factors for low student achievement or reading difficulties included children of parents who had reading difficulties, lack of exposure to literacy before schooling begins, lack of age-appropriate skills, or being diagnosed with a medical or learning disability (Snow, et al., 1998).

Hattie's (2009) meta-analysis on the influence of SES on student achievement, which included over 499 studies, concluded that SES constitutes as a significant factor in achievement. However, as Hattie (2009), Adams (1990) and Snow et al (1998) have indicated, it is not simply the factors of poverty on the individual child that were of highest influence on student achievement; instead, the group risk factors (school and community) of poverty were much more influential. This means that a student from a low SES background who lives in a higher SES community is less at risk than a student from a low SES family who also lives in a low SES community and attends a lower SES school (White, 1982). While individual low SES status was a risk factor for achievement, low SES was a much greater group risk factor. Thus, attending a school consisting mostly of low SES students was a risk factor. Such research could lead one to believe

that it is the schools that were inferior and, therefore, cause low achievement. However, one study has shown that students of low and high SES status learn at the same rate during the school year, it was during non-school times (before a child starts school or summer time) that low SES students fell behind academically and remained progressively behind (Alexander & Entwisle, 1996). Although low SES students can fall behind academically, researchers have concluded that the risk factors for poor readers did not determine their ability to learn to read successfully (Snow, et al., 1998).

The risk factors of poverty can impact behavior, language acquisition, and vocabulary, and brain development (Kaiser, Roberts, & McLeod, 2011). Jensen (2009) defined the effects of SES on the language system of the brain, the perisylvian systems stating that it was affected by more than 30 percent. This may explain why low SES student have been proven to learn differently than students from other SES groups. Hart and Risley (1995) discovered that the most powerful differences in a child's language and vocabulary did not originate from race, ethnicity, gender, or even birth order; instead, they found that these differences originated from a child's socio-economic status, which helped to explain how the perisylvian system of the brain was so heavily impacted. Graves and Slater (1987) reported similar findings, stating that first graders living in high SES backgrounds had double the vocabulary of children from low SES backgrounds. Since vocabulary growth was rapid throughout the preschool years (Snow, et al., 2006), this variance in vocabulary development was a fundamental attribute in student achievement differences. Dovetailing with language, classroom behaviors of low SES children adversely impacted reading achievement as well. According to Kaiser, Roberts, and McLeod (2011), children with poor language skills engaged less in the classroom,

struggled to communicate with children who possessed better language skills, were less able to problem solve, and exhibited less language growth than same-age peers. It is necessary that educators understand these risk factors and begin to address them at multiple levels because, as studies suggest, how well a child reads by the third grade serves as a reasonable prediction of graduation rates and overall academic achievement (Slavin, 1994).

In terms of instruction and low SES students, research indicates that low SES students can succeed. However, Chall's (1967) research revealed that students from different SES backgrounds learn differently. Instructional strategies that benefited low SES students were those that had a heavy emphasis on decoding because decoding through phonemic awareness and phonics instruction taught students to independently recognize words. Middle class and affluent homes provided children with more opportunities to discover words and children from those SES groups needed less decoding emphasis (Chall, 1967). However, phonemic awareness seemed to be one of the few strategies that transcended socio-economic status, as it has shown positive and significant effect sizes for students at all socio-economic levels (NRP, 2000). For low SES students phonemic awareness had an effect size of $d = 1.07$ and for students of middle to high SES backgrounds phonemic awareness had an effect size of $d = 1.02$. While the effects of phonemic awareness instruction for at-risk readers were greater than normally progressing readers, students seemed to benefit from phonemic awareness regardless of economic status. However, the transfer of phonemic awareness to reading and spelling was considerably greater between middle to high SES students (NRP, 2000).

**Summary**

This literature review provided a comprehensive background for reading development and best practices in reading instruction. Chapter two began with an overview of the theories of learning and how they pertained to reading development and instructional practices. Next, a brief description of reading instruction in America is followed by the reading debates of top-down and bottom-up theorists. A review of the five components of reading as defined by the National Reading Panel (2000) (phonemic awareness; phonics; fluency; vocabulary; and comprehension) were discussed with an in-depth review on phonemic awareness. Chapter two concluded with an overview on socio-economic status and other risk factors to reading achievement. Chapter three describes the research methods and design. Providing results, chapter four, describes the results for each research question.

# Chapter Three

## Methods

This study was conducted to determine the impact phonemic awareness instruction had on student reading achievement growth, as measured by the TRC. Secondly, the study examined the amount of reading growth for students at varying socio-economic levels. Finally, reading growth for students enrolled in schools in their first year of implementation of phonemic awareness instruction was compared with the reading growth of schools in their second year of implementing phonemic awareness instruction. Chapter three begins with a description of the research design. This is followed by the population, sample, and sampling procedures; description of instrumentation; collection procedures; an explanation of data analysis and hypothesis testing; and finally the limitations of the study.

### Research Design

This quantitative study consisted of a purposive sampling of 3,375 students' archived Text Reading Comprehension (TRC) data. The three independent variables tested in this research were: test time (beginning of year, middle of year, end of year), socio-economic status of school, and the length of implementation (one year or two years). Reading growth was calculated using test time: beginning of year to middle of year, middle of year to end of year, and beginning of year to end of year.

### Population and Sample

A sampling of 3,375 students from 16 elementary schools included three high socio-economic status (SES) schools, five middle SES schools, and eight low SES schools were included in this study. In 2011, the elementary school sizes ranged from

290 students per building to over 500 students per building. Table 1 displays the schools by letter name, the school's socio-economic status as determined by Missouri's DESE, and the school's free and reduced lunch rate.

**Sampling Procedures**

The researcher used purposive sampling. Lunenburgh and Irby (2008) describe purposive sampling as, "…selecting a sample based on the researcher's experience or knowledge of the group to sampled" (p. 175). Students were selected for this sample according to following criteria: the student had to be in kindergarten through second grade, attend schools implementing phonemic awareness, and had to have been assessed at all three test times.

Table 1

*Socio-Economic Status of Schools in the River Bluff School District*

| Status | School Name | Percentage of Free and Reduced Lunch |
|---|---|---|
| High | School A | 27.7% |
| | School B | 32.2% |
| | School C | 34.6% |
| Middle | School D | 63.0% |
| | School E | 67.1% |
| | School F | 52.3% |
| | School G | 60.7% |
| | School H | 58.9% |
| Low | School I | 88.0% |
| | School J | 80.6% |
| | School K | 81.1% |
| | School L | 92.6% |
| | School M | 85.0% |
| | School N | 79.4% |
| | School O | 75.5% |
| | School P | 85.4% |

*Note.* Free and reduced percentages are reported from the Missouri Department of Secondary and Elementary Education, classification of high, middle, and low SES as reported in the *Race to the Top Application for Initial Funding*, DESE 2010.

## Instrumentation

The Text Reading Comprehension (TRC) is a one-on-one reading assessment administered by a teacher on an iPad, that provides measurements for reading accuracy

from a running record and oral comprehension. To observe and measure student performance, the TRC utilizes authentic, or real, texts in either fiction or non-fiction. Each text is normed and leveled by mClass®, in accordance to the Fountas and Pinnell, guided reading levels. Reading accuracy was measured by a running record, adapted from the running records used by both Mary Clay (1993), founder of Reading Recovery, and Fountas and Pinnell (1996), well known for their research in balanced literacy. A running record is a "tool for coding, scoring, and analyzing a child's precise reading behaviors" (Fountas & Pinnell, 1996). Basically, the text is replicated on the iPad and the teacher makes notes and marks errors on the iPad text, based on what the child reads. Figure one is an example of what the running record looks like on the iPad.

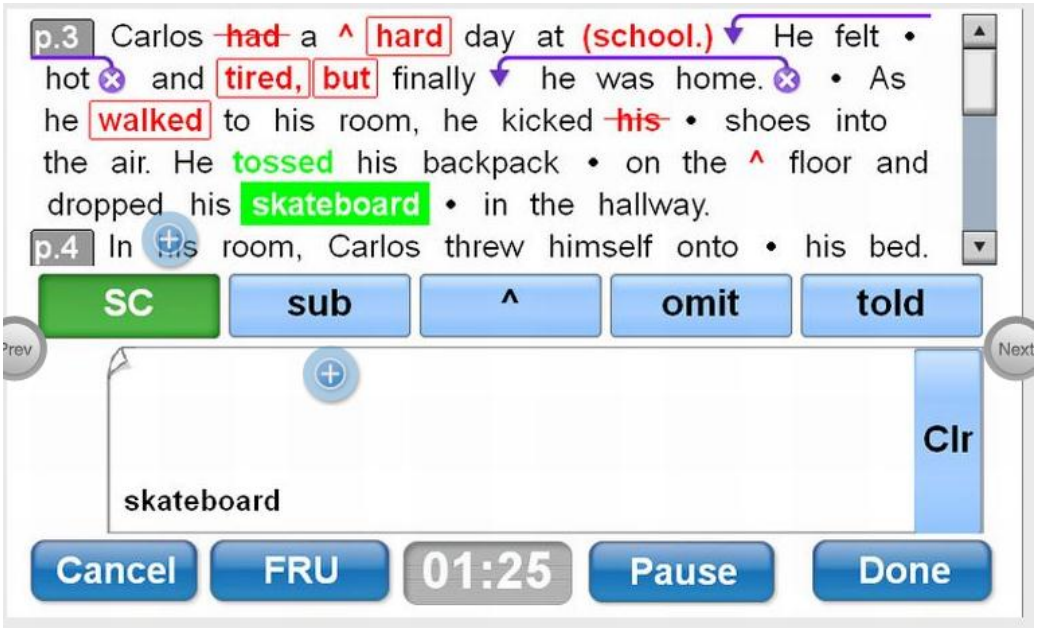


*Figure 1.* Running Record.

Note. Figure one is an example of a running record retrieved from, http://www.wirelessgeneration.com/.

In Figure 1 a child is reading a piece of text selected by the teacher based on the teacher's knowledge of the child's reading level. While the student reads the text, the teacher notes miscues or errors in the areas of meaning, syntax, or visual information

(reading big for bug, the words look alike but are different and cannot substitute one-another). After the assessment is complete notations for errors in meaning, syntax, or visual information help the teacher evaluate and diagnose reading needs for instruction. In this example the first word, *Carlos*, is read correctly and therefore has no notations. The second word, *had*, was omitted, therefore the teacher indicates in the box below that the word was omitted and presses the blue button with the word, *omit*, on it. The small red carrot indicates that the student inserted a word not written in the text. The word, *school*, read to the student by the teacher; thus, it was indicated by the teacher pressing the blue button, *told*, and the TRC reading assessment counts, *school*, as an error. The purple arrow over the words, *he felt hot*, indicate that the student repeated that section of text during reading. The words in boxes, such as *tired* and *but*, indicate that the child has substituted a different word for the one written in the text. For example, the child may have read, *tried*, instead of, *tired*. *Tossed* is highlighted in green because the child self-corrected his or her own error. Finally, the word, *skateboard*, is highlighted because that is where the child currently is in the assessment, the observer can see that the teacher is marking the *SC* button for self-correct. If the teacher is administering an assessment and believes the student is frustrated before the text is completed, he or she may press the *FRU* button to suspend the assessment for future use.

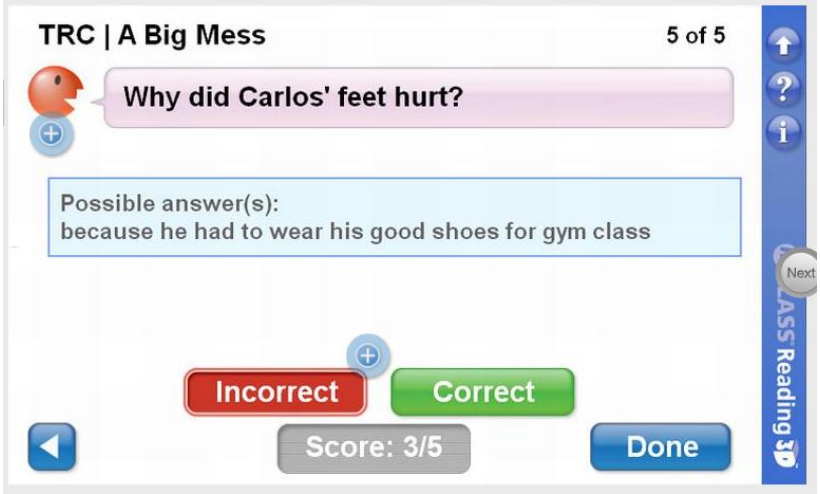


*Figure 2.* Comprehension Question.

*Note*. Retrieved from http://www.wirelessgeneration.com/, Figure 2 is a sample of comprehension questions from the TRC on the iPad.

If the child has read the passage at a 90 % or above accuracy rate, the teacher continues the assessment by asking three comprehension questions, one literal question, one inference question, and one critical thinking question, from a question bank provided by the TRC. A child can earn up to four points per question. In order to pass a given level, the child must have an accuracy rating at 90 % or more along with an average of 2.5 on the oral comprehension. After the running record and comprehension questions, data on reading results is reported to the teacher through the TRC electronic system. In order to calculate the accuracy rate, the teacher divides the number of words read correctly by the number of words (generally 100 words per passage). However, all calculations are completed automatically through TRC on the iPad. All words in the text can be counted as miscues, including the words, *and*, *the*, and names of people. However, reading a name incorrectly more than once counts as only one error. Word substitutions, omitted words, and inserted words are also classified as reading errors on a running record (Fountas & Pinnell, 1996).

Accuracy ratings fall into one of three categories: below 90 % is too hard for the child and is in the frustrational level, 90 % to 94 % is in the instructional level, meaning that reading of the text requires support from the teacher, 95 % to 100% is too easy for the child or falls in the child's independent reading level, meaning that they can read the book independently without teacher support (Fountas & Pinnell, 1996). If the child completes the reading accuracy at 90% or better along with an average of 2.5 or more on the oral comprehension portion, the child has passed that level. The teacher may then go on to the next level and repeat the same steps. Once the child has not passed a level, a guided reading level is established. For example, if the teacher selected a level G book and the child has passed the level G, the teacher would then move on to a level H book. If the child does not pass the level H book, the child's score would result in a level G.

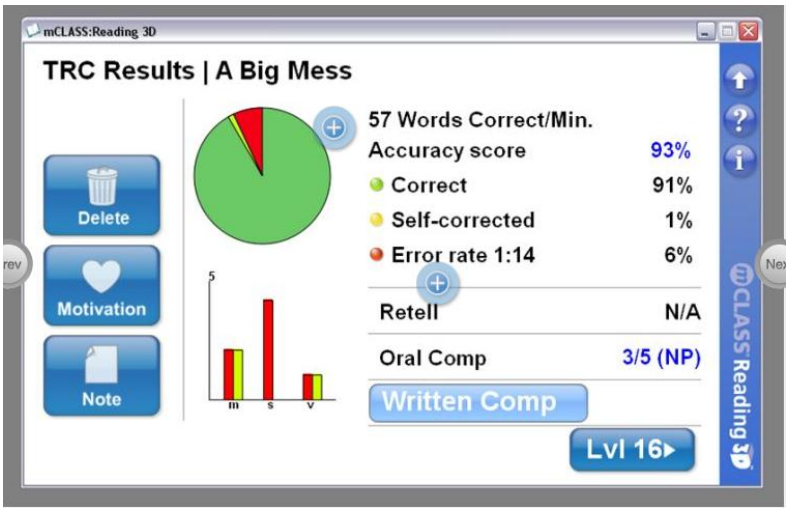


*Figure 3*. Data Report.

*Note*. Retrieved from http://www.wirelessgeneration.com/.

Figure three is an example of the data reported to the teacher. In this example the student read 57 words correct per minute, resulting in an accuracy score of 93 %. The student read 91% of all words correctly, self-corrected one percent, and had a 6% error

rate. The child answered three out of five comprehension questions correct. The teacher may note motivation behaviors by pressing the heart symbol, the motivation button. While the motivation notes will not affect the score, it is useful information for the teacher. Notes on motivation may include that the student was feeling ill, was not performing at their usual best, or that the student was upset because they were missing something in the classroom. Because the child read at a 90 % or better accuracy rate and answered the necessary number of comprehension questions correctly, the child's level is established at 16, noted in the bottom right hand corner.

Table 2 defines guided reading levels and their corresponding grade levels. PC indicates a pre-reading level, called print concepts. At this level students are beginning to understand how books and print work. For example, a student knows where the front of a book is, the difference between a letter and a word, and the difference between a capital letter and lower case letter. RB indicates another pre-reading level, reading behavior. In this stage a student understands directionality (reading left to right), return sweep (returning to the next line of text), one-to-one correspondence, and the reader can repeat patterns. Guided reading level A indicates the level at which student begins reading text combined with all the components of PC and RB, such as one-to-one correlation of reading and finger matching or return and sweep. First grade guided reading levels are B-I and second grade reading levels are I-L. Level M+ indicates guided reading levels M and beyond whereas 3+ indicates third grade and beyond.

Table 2

*Grade Level Bands for TRC Scores*

| Descriptor | Grade Level | TRC Reading Level | Corresponding Numbers |
|---|---|---|---|
| Beginning of year | K | PC | |
| | | RB | A |
| | | A | 1 |
| End of year | K | B | 2 |
| Beginning of year | 1 | B | 2 |
| | | C | 4 |
| | | D | 6 |
| | | E | 8 |
| | | F | 10 |
| | | G | 12 |
| | | H | 14 |
| End of year | 1 | I | 16 |
| Beginning of year | 2 | I | 16 |
| | | J | 17 |
| | | K | 18 |
| End of year | 2 | L | 20 |
| End of year | 3+ | M+ | 24+ |

*Note.* Retrieved from the TRC reporting website, Wireless Generation http://www.wirelessgeneration.com/. 3+ indicates third grade and above, M+ indicates, level M and above.

**Measurement**.

The TRC is designed to be an age and content area appropriate assessment. It measures both reading word accuracy and comprehension and is developmentally appropriate as indicated by Balanced Literacy proponents Founata and Pinnell (1996) for elementary students, particularly those in this study, kindergarten through second graders. The TRC is adapted from various reading assessments including Clay's (2001) Reading Recovery and Foutnas and Pinnell (1996) guided reading assessments. The TRC is both formative in that the teacher can provide interventions and differentiate instruction based on the child's miscues at the beginning of year and at the middle of year testing period. The end of year score is summative and is reported as the final score for the child and school. The data used in this study were obtained from beginning of year, middle of year, and end of year test times. Growth was calculated from beginning to middle of year, middle to end of year, and beginning to end of year.

**Validity and reliability**.

Lunenburg and Irby (2008) defined reliability as "the degree to which an instrument consistently measures whatever it is meaning" (p. 182). Clay's (2002) development of the observation survey, which includes running records as an essential component of reading text assessment, was found to be reliable by numerous researchers. Table 3 indicates reliability tests and results for Clay's work on reading assessments and running records.

Table 3

*Clay (2002) Reliability Estimates*

| Authors(s) | Date | Number of Children | Type of Reliability | Reliability |
|---|---|---|---|---|
| Concepts of print | | | | |
| Clay | 1966 | 100 | Split half | .95 |
| Clay | 1968 | 40 | KR-20 | .85 |
| Day & Day | 1980 | 56 | Split half | .84-.88 |
| Perkins | 1978 | | Test-retest | .73-.89 |
| Gilmore | 1998 | | Cronbach Alpha | .87 |
| Pinnell et al | 1990 | 106 | Cronbach Alpha | .78 |
| Letter identification | | | | |
| Clay | 1966 | 100 | Split half | .97 |
| Pinnell et al | 1990 | 106 | Cronbach Alpha | .95 |
| Word Reading | | | | |
| Clay | 1966 | 100 | KR-20 | .90 |
| Pinnell et al | 1990 | 107 | Cronbach Alpha | .92 |

*Note.* Clay, M. (2002). *An observation survey: Of early literacy achievement*. Portsmouth, NH: Heinemann.

The TRC is a reading assessment based on the research of Fountas and Pinnell (1996) and Clay (1993). Each of which analyzed reading accuracy, fluency, and comprehension via running records and miscue analysis. Although the TRC developers did not conduct reliability assessments of their own, it can be concluded that TRC reliability still exists because it is based on the running record assessment research from Clay, Fountas, and Pinnell.

Additionally, studies that have evaluated the validity of running records found Clay's application of running records to be a valid assessment. Lunenburg and Irby (2008) defined validity as "the degree to which an instrument measures what it purports to mean" (p. 181). The Washington Educational Research Association (2000) found correlations between running records and state assessments for vocabulary and word analysis to be in the moderate range, .71 and .54 respectively. Correlations providing acceptable evidence for validity are those that measure above .70; moderate to strong criterion validity for running records were indicated for Clay's research on observational surveys. Additionally, vocabulary and word analysis correlations were strong enough that one could predict a student's grade level status. Since the TRC is based on the same observational survey, it can be concluded that the TRC is valid as well.

The research of Rodgers, Gomez-Bellenge, Wang, and Schultz (2005) also supported Clay's research on the reliability of observational surveys. Rodgers et al.'s factor analysis of the six indicators on the observational survey revealed that one factor, reading, explained 52.75% of the total variance. It can be inferred that the TRC is valid, as it is based on Clay's measurement tool, which also measures the same factor. Furthermore, Tang and Gomez-Bellenge (2007) concluded that the validity and reliability

of the observational survey is a tool that can be used for program evaluation despite the fact that it is fundamentally a criterion-referenced assessment used to inform instructional practices.

In 2008, the Montgomery County Public School's (MCPS) Office of Shared Accountability in Maryland, analyzed the TRC for accuracy and error patterns from an analytic sample. The MCPS included an analytic sample of TRC scores for students in kindergarten through second grade over a three-year time span. Kindergarten scores did not predict state standard success until the student met the TRC benchmark for level five or higher. Nearly all of the first grade students who scored at or above TRC benchmark standards met state standards. Finally, second grade TRC scores indicated that over 90% of students who met the TRC benchmark standards scored proficient or higher on state standards. The TRC was found to be a quality predictor for Maryland's benchmark indicators (2008).

The combination of the results from various researchers, most notably, Clay (2002) and Fountas and Pinnell (1996), support the validity and reliability of the TRC. Moreover, the TRC is a low inference assessment, the reading accuracy measurement involves little or no inference. The TRC formulates results on observable reading behaviors. Simply put, the TRC measures how many errors a child makes during a reading sample. Heinemann, the publisher of both Clay's and Fountas and Pinnell's works stated, "The development of the Running Records actually stems from the research done by Marie Clay and others for Reading Recovery (Also known as a Reading Record). Reading Recovery's methods have been extensively researched and found to be valid and reliable and national norms have been developed to assist in interpreting the scores."

**Data Collection Procedures**

A proposal of research was submitted to and approved by Baker University Institutional Review Board (IRB). Permission was granted from the River Bluffs School District to conduct the study using TRC data from the school district data storage system (see approval in Appendix 1). All data obtained from the River Bluffs School District assessment office was exported into a Microsoft Excel spreadsheet. The spreadsheet was sorted so that TRC scores were arranged horizontally as beginning of year, middle of year, and end of year and coincided with the non-identifiable student identification number. Student scores that did not contain all three data points were removed from the sample by the researcher. In addition the socio-economic status level and years of phonemic awareness instruction were exported into the Microsoft Excel spreadsheet.

**Data Analysis and Hypothesis Testing**

Nine hypothesis tests were conducted to address the research questions:

1. To what extent does phonemic awareness instruction impact the growth in kindergarten students' TRC scores across three designated data points?
2. To what extent does phonemic awareness instruction impact the growth in first grade students' TRC scores across three designated data points?
3. To what extent does phonemic awareness instruction impact the growth in second grade students' TRC scores across three designated data points?
4. To what extent is there a difference in the change in reading growth in kindergarten TRC scores, between identified high SES and low SES schools?
5. To what extent is there a difference in the change in reading growth in first grade TRC scores between identified high SES and low SES schools?

6. To what extent is there a difference in the change in reading growth in second grade TRC scores between identified high SES and low SES schools?
7. To what extent is there a difference in the reading growth of kindergarten TRC scores between students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year implementers of phonemic awareness instruction?
8. To what extent is there a difference in the reading growth of first grade TRC scores between students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year implementers of phonemic awareness instruction?
9. To what extent is there a difference in the reading growth of second grade TRC scores between students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year implementers of phonemic awareness instruction?

Each of the research questions one through three were addressed using a one-factor repeated measures analysis of variance (ANOVA), to determine if statistically significant differences in student reading achievement existed as measured by the TRC among kindergarten, first, and second grade students in the River Bluffs School District as a result of phonemic awareness instruction. When appropriate, a follow-up post hoc analysis, the Tukey Honestly Significant Difference (HSD), was used to determine which pairs of means were statistically different. This involved examining the means from beginning of year to middle of year, middle of year to end of year, and beginning of year to end of year for each research question, one through three.

Next, each of the research questions four through six were addressed using a two-factor analysis of variance (ANOVA), one repeated measure and one between, to determine if the implementation of phonemic awareness instruction in schools of differing socio-economic backgrounds made a statistically significant difference in the growth of TRC scores for students in kindergarten through second grade. When appropriate, a follow-up post hoc analysis, the Tukey Honestly Significant Difference (HSD), was used to determine which pairs of means from the statistically significant interaction effects: beginning of year to middle of year, middle of year to end of year, or beginning of year to end of year TRC scores for high SES and low SES schools, for each research questions four through six.

Finally, for research questions seven through nine, a two-factor analysis of variance (ANOVA) was conducted to determine if the number of years of phonemic awareness instruction (one year or two years for pilot schools) had statistically significant differences in student reading achievement as measured by the TRC for students in kindergarten through second grade. When appropriate a follow-up post hoc analysis, Tukey's Honestly Significant Difference (HSD) was used to determined which pairs of means from the statistically significant interaction effect: beginning of year to middle of year, middle of year to end of year, and beginning of year to end of year TRC scores.

**Limitations**

Limitations, as defined by Lunenburg and Irby (2008), are the "factors that may have an effect on the interpretation of the finding or on the generalizability of the results" (p. 133). This study has the following limitations:

1. Not all students participated in testing at all three TRC test times: beginning of year, middle of year, and end of year, and were not used in this analysis, thus eliminating highly mobile or transient student populations.
2. The potential for data entry and maintenance errors by teachers and district employees is unknown.
3. The level of student motivation during the TRC reading assessment is unknown.

**Summary**

This chapter reviewed the purpose of the research study and detailed the process used to obtain TRC data necessary to answer each research question. The instrumentation was outlined including the validity and reliability of the TRC. An explanation of the data collection procedures was discussed and the statistical analysis of the data was explained. Chapter four will reports the result from the data analysis discussed in chapter three.

# Chapter Four

## Results

The purpose of this study was to determine the effectiveness of phonemic awareness instruction on reading achievement as measured by the Text Reading Comprehension (TRC) reading assessment for students in kindergarten through second grade in the River Bluffs School District. Reading growth was measured using three data test scores from the TRC: beginning of year, middle of year, and end of year. This study also examined growth in reading achievement in schools of varying socio-economic status (SES). Finally, this study sought to determine if years of phonemic awareness instruction had statistically significant differences on reading growth. Schools in their first year of implementation and schools in their second year of implementation were examined.

The following section, hypothesis testing, contains results from a one-factor ANOVA and post hoc analyses conducted to determine if phonemic awareness instruction had significant effects on student reading achievement as measured by the TRC. Results of two-factor ANOVAs and post hoc analyses were utilized to determine if phonemic awareness instruction had significant effects on reading achievement in schools of varying socio-economic status (SES). Lastly, two-factor ANOVAs was conducted to analyze the differences among schools in their first year of phonemic awareness instruction and schools in their second year of phonemic awareness instruction implementation.

**Hypothesis Testing**

RQ 1: To what extent does phonemic awareness instruction impact the growth in kindergarten students' Text Reading Comprehension (TRC) scores across three designated data points?

H 1: There is a statistically significant difference in student reading achievement as measured by the TRC for kindergarten students across all three data points (beginning of year, middle of year, end of year).

A one-factor analysis of variance (ANOVA) was conducted to test hypothesis one. The categorical variable used to group the students' scores was test time (beginning of year, middle of year, end of year). As shown in Table 4 the results of the analysis indicated statistically significant differences in the TRC between at least two means ($F$ = 764.780, $df$ = 2, 1540, $p$ = .000).

Table 4

*Test Statistics for the One-factor ANOVA Growth in Reading Achievement for Kindergarten*

| | *MS* | *df* | *F* | *p* |
|---|---|---|---|---|
| Kindergarten | 4206.13 | 2 | 764.78 | .000 |
| Error | 5.50 | 1540 | | |

A Tukey Honestly Difference (HSD) post hoc was used to determine which means were significantly different: beginning of year and middle of year, middle of year and end of year, or beginning of year and end of year. The Tukey's (HSD) critical value for kindergarten TRC scores was 0.28. The differences between the means had to be

greater than this value to be considered significantly different ($\alpha$ = .05). The difference between the beginning of year mean TRC score (0.11) and the middle of year mean TRC score (1.42) was statistically significant. Student scores increased 1.32, which is greater than the critical value (0.28). The difference between the middle of year mean TRC score (1.43) and the end of year mean TRC score (4.65) was statistically significant. Student scores increased 3.22, which is greater than the critical value. The difference between the beginning of year mean TRC score (0.11) and the end of year mean TRC score (4.65) was statistically significant. Student scores increased 4.54, which is greater than the critical value. Table 5 displays the means and standard deviation for the analysis of hypothesis one. Hypothesis one was supported.

Table 5

*Descriptive Statistics for Kindergarten TRC Test Times*

| Test Time | *Mean* | *Standard Deviation* | *n* |
|---|---|---|---|
| BOY TRC | 0.11 | .87 | 771 |
| MOY TRC | 1.43 | 2.33 | 771 |
| EOY TRC | 4.65 | 4.54 | 771 |

*Note.* Beginning of year = BOY, Middle of year = MOY, and end of year = EOY.

RQ 2: To what extent does phonemic awareness instruction impact the growth in first grade students' Text Reading Comprehension (TRC) scores across three designated data points?

H 2: There is a statistically significant difference in student reading achievement as measured by the TRC for first grade students across all three data points (beginning of year, middle of year, end of year).

A one-factor analysis of variance (ANOVA) was conducted to test hypothesis two, the results are indicated in Table 6. The categorical variable used to group the students' scores was test time (beginning of year, middle of year, end of year). The results of the analysis indicated a statistically significant difference between at least two of the means ($F$ = 1714.220, $df$ = 2,1514, $p$ = .000).

Table 6

*Test Statistics for the One-factor ANOVA Growth in Reading Achievement for First Grade*

| | *MS* | *df* | *F* | *p* |
|---|---|---|---|---|
| First Grade | 35026.81 | 2 | 1714.22 | .000 |
| Error | 20.43 | 1514 | | |

A Tukey Honestly Difference (HSD) post hoc follow up procedure was conducted to determine which means were significantly different: beginning of year and middle of year, middle of year and end of year, or beginning of year and end of year. The Tukey's (HSD) critical value for first grade TRC scores was 0.54. The differences between the means had to be greater than this value to be considered significantly different ($\alpha$ = .05). The difference from the beginning of year mean TRC score (3.58) and the middle of year mean TRC score (8.48) was statistically significant. Student scores increased 4.90, which is greater than the critical value (0.54). The difference from the middle of year mean TRC score (8.48) and the end of year mean TRC score (17.01) was statistically significant. Student scores increased 8.53, which is greater than the critical value. The difference between the beginning of year mean TRC score (3.58) and the end of year

mean TRC score (17.01) was statistically significant. Student scores increased 13.43, which is greater than the critical value. Table 7 displays the means and standard deviation for the analysis of hypothesis two. Hypothesis two was supported.

Table 7

*Descriptive Statistics for First Grade TRC Times*

| Test Time | *Mean* | *Standard Deviation* | *n* |
|---|---|---|---|
| BOY TRC | 3.58 | 4.34 | 758 |
| MOY TRC | 8.48 | 6.53 | 758 |
| EOY TRC | 17.01 | 9.19 | 758 |

RQ 3: To what extent does phonemic awareness instruction impact the growth in second grade students' Text Reading Comprehension (TRC) scores across three designated data points?

H 3: There is a statistically significant difference in student reading achievement as measured by the TRC for second grade students across all three data points (beginning of year, middle of year, end of year).

A one-factor analysis of variance (ANOVA) was conducted to test hypothesis three. The categorical variable used to group the students' scores was test time (beginning of year, middle of year, end of year). The results of the analysis indicated a statistically significant difference between at least two of the three means ($F$ = 1222.27, $df$ = 2, 26.912, $p$ = .000).

See Table 8 for the means and standard deviations of this analysis.

Table 8

*Test Statistics for the One-factor ANOVA Growth in Reading Achievement for Second Grade*

| | *MS* | *df* | *F* | *p* |
|---|---|---|---|---|
| Second Grade | 32893.27 | 2 | 1222.27 | .000 |
| Error | 26.91 | 1546 | | |

A follow-up post hoc, the Tukey Honestly Difference (HSD), was used to determine which means were significantly different: beginning of year and middle of year, middle of year and end of year, or beginning of year and end of year. The Tukey's (HSD) critical value for second grade TRC scores was 0.62. The differences between the means had to be greater than this value to be considered significantly different ($\alpha = .05$). The difference from the beginning of year mean TRC score (13.84) and the middle of year mean TRC score (19.39) was statistically significant. Student scores increased 5.55, which is greater than the critical value (0.62). The difference from the middle of year mean TRC score (19.39) and the end of year mean TRC score (26.83) was statistically significant. Student scores increased 12.99, which is greater than the critical value. The difference between the beginning of year mean TRC score (13.84) and the end of year mean TRC score (26.83) was statistically significant. Student scores increased 12.99, which is greater than the critical value. Table 9 displays the means and standard deviation for the analysis of hypothesis three. Hypothesis three was supported.

Table 9

*Descriptive Statistics for Second Grade TRC Times*

| Test Time | *Mean* | *Standard Deviation* | *n* |
|---|---|---|---|
| BOY TRC | 13.84 | 8.37 | 774 |
| MOY TRC | 19.39 | 8.99 | 774 |
| EOY TRC | 26.83 | 9.60 | 774 |

RQ 4: To what extent is there a difference in the change in reading growth in kindergarten TRC scores, between identified high SES and low SES schools?

H 4: There is a statistically significant difference in student reading growth as measured by the TRC for kindergarten students in schools of varying socio-economic status (SES) across all three data points (beginning of year, middle of year, end of year).

A two-factor ANOVA was conducted to test hypothesis four. The two categorical variables used to group the students' scores were test time (beginning of year, middle of year, end of year) and SES (low, middle, high). The two-factor ANOVA can be used to test the hypothesis, including a main effect for test time, a main effect for SES, and a two-way interaction effect (test time x SES). The interaction effect for test time by SES was used to test hypothesis four. The results of the analysis indicated a statistically significant difference between at least two of the nine means ($F = 3.64$, $df = 4,1536$, $p = .01$).

Table 10

*Test Statistics for the Two-factor ANOVA for High and Low Kindergarteners*

| | *MS* | *df* | *F* | *p* |
|---|---|---|---|---|
| Kindergarten | 19.87 | 4 | 3.64 | .006 |
| Error | 5.46 | 1536 | | |

A follow-up post hoc was conducted to determine which pairs of means were different. The Tukey's Honestly Significant Difference (HSD) critical value was 0.68. The differences between the means had to be greater than this value to be considered statistically significantly ($\alpha = .05$). See Table 11 for the means and standard deviations for this analysis.

Table 11

*Kindergarten TRC Scores Test Time x SES*

| Test Time | *SES Level* | *Mean* | *Standard Deviation* | *n* |
|---|---|---|---|---|
| BOY TRC | H | .10 | .752 | 147 |
| | M | .06 | .429 | 277 |
| | L | .16 | 1.14 | 347 |
| MOY TRC | H | 1.86 | 2.77 | 147 |
| | M | 1.42 | 2.45 | 277 |
| | L | 1.25 | 1.99 | 347 |
| EOY TRC | H | 5.42 | 4.43 | 147 |
| | M | 4.73 | 4.81 | 277 |
| | L | 4.27 | 4.33 | 347 |

The differences between the means were each greater than Tukey's HSD critical value of 0.68 ($\alpha = .05$) and were, therefore, statistically significant. The growth for high SES mean TRC scores from the beginning of year to middle of year was 1.77 and the growth from the middle of year to end of year was 3.55, both of which were greater than the critical value of 0.68. The growth for middle SES mean TRC score from the beginning of year to middle of year was 1.54 and the growth from the middle of year to end of year was 3.30, both of which were greater than the critical value. The growth for low SES mean TRC score from beginning of year to middle of year was 1.09 and the growth from middle of year to end of year was 3.02, both of which were greater than the

critical value. Regardless of socio-economic status, students, appeared to have all grown approximately the same amount from beginning of year to middle of year and middle of year to end of year. Hypothesis four was supported.

Table 12

*Kindergarten Growth in TRC Scores and SES*

| SES Status | Testing Period | Growth |
|---|---|---|
| High SES | BOY to MOY | 1.77 |
| | MOY to EOY | 3.55 |
| | BOY to EOY | 5.32 |
| Middle SES | BOY to MOY | 1.54 |
| | MOY to EOY | 3.30 |
| | BOY to EOY | 4.66 |
| Low SES | BOY to MOY | 1.09 |
| | MOY to EOY | 3.02 |
| | BOY to EOY | 4.11 |

*Note.* Tukey's HSD = 0.68. Beginning of year = BOY, Middle of year = MOY, and end of year = EOY.

RQ 5: To what extent is there a difference in change in reading growth in first grade TRC scores between identified high SES and low SES schools?

H 5: There is a statistically significant difference in student reading growth as measured by the TRC for first grade students in schools of varying socio-economic status (SES) across all three data points (beginning of year, middle of year, end of year).

A two-factor ANOVA was conducted to test hypothesis five. The two categorical variables used to group the students' scores were test time (beginning of year, middle of year, end of year) and SES (low, middle, high). The two-factor ANOVA can be used to test the hypothesis, including a main effect for test time, main effect for SES, and a two-way interaction effect (test time x SES). The interaction effect for test time by SES was used to test hypothesis five. The results of the analysis indicated a statistically significant difference between at least two of the nine means ($F = 10.517$, $df = 4$, $p = .000$).

Table 13

*Test Statistics for the Two-factor ANOVA Used to Test H5*

| | *MS* | *df* | *F* | *p* |
|---|---|---|---|---|
| First Grade | 209.624 | 4 | 10.517 | .000 |
| Error | 19.932 | 1510 | | |

A follow-up post hoc was conducted to determine which pairs of means were different. The Tukey's Honestly Significant Difference (HSD) critical value was 1.30. The differences between the means had to be greater than this value to be considered significantly different ($\alpha = .05$). See Table 14 for the means and standard deviations for this analysis.

Table 14

*First Grade TRC Scores Test Time x SES*

| Test Time | *SES Level* | *Mean* | *Standard Deviation* | *n* |
|---|---|---|---|---|
| BOY TRC | H | 4.74 | 5.12 | 151 |
| | M | 3.95 | 4.49 | 263 |
| | L | 2.78 | 3.64 | 344 |
| MOY TRC | H | 10.66 | 6.94 | 151 |
| | M | 8.08 | 6.02 | 263 |
| | L | 7.82 | 6.54 | 344 |
| EOY TRC | H | 19.42 | 8.06 | 151 |
| | M | 15.41 | 8.45 | 263 |
| | L | 17.17 | 9.95 | 344 |

*Note.* Beginning of year = BOY, Middle of year = MOY, and end of year = EOY.

The differences between the means were each greater than Tukey's HSD critical value of 0.68 ($\alpha = .05$) and were, therefore, statistically significant. The growth in reading for high SES mean TRC scores from the beginning of year to middle of year was 5.92 and the growth from the middle of year to end of year was 8.76, both of which were greater than the critical value of 1.30. The growth for middle SES mean TRC score from the beginning of year to middle of year was 4.13 and the growth from the middle of year to end of year was 7.33. The growth in reading for low SES mean TRC score from beginning of year to middle of year was 5.04 and the growth from middle of year to end of year was 9.36. Regardless of SES, students appeared to have grown approximately the

same amount of growth when you look at beginning of year to middle of year, middle of year to end of year, and beginning of year to end of year. Hypothesis five was supported.

Table 15

*First Grade Growth in TRC Scores and SES*

| SES Status | Testing Period | Growth |
|---|---|---|
| High SES | BOY to MOY | 5.92 |
| | MOY to EOY | 8.76 |
| | BOY to EOY | 14.68 |
| Middle SES | BOY to MOY | 4.13 |
| | MOY to EOY | 7.33 |
| | BOY to EOY | 11.46 |
| Low SES | BOY to MOY | 5.04 |
| | MOY to EOY | 9.36 |
| | BOY to EOY | 14.40 |

*Note.* Tukey's HSD = 1.307. Beginning of year = BOY, Middle of year = MOY, and end of year = EOY.

RQ 6: To what extent is there a difference in the change in reading growth in second grade TRC scores between identified high SES and low SES schools?

H 6: There is a statistically significant difference in student reading growth as measured by the TRC for second grade students in schools of varying socio-economic status (SES) across all three data points (beginning of year, middle of year, end of year).

A two-factor ANOVA was conducted to test hypothesis six. The two categorical variables used to group the students' scores were test time (beginning of year, middle of

year, end of year) and SES (low, middle, high). The two-factor ANOVA can be used to test three hypotheses, including a main effect for test time, main effect for SES, and a two-way interaction effect (test time x SES). The interaction effect for test time by SES was used to test hypothesis six, see Table 16. The results of the analysis indicated a statistically significant difference between at least two of the nine means ($F = 4.456$, $df = 4$, $p = .001$).

Table 16

*Test Statistics for the Two-factor ANOVA Used to Test H6*

| | *MS* | *df* | *F* | *p* |
|---|---|---|---|---|
| Second Grade | 118.86 | 4 | 4.45 | .001 |
| Error | 26.67 | 1542 | | |

A follow-up post hoc was conducted to determine which pairs of means were different. The Tukey's Honestly Significant Difference (HSD) critical value was 1.48. The differences between the means had to be greater than this value to be considered significantly different ($\alpha = .05$). All of the differences were greater than this value (1.48) when growth from test to test was analyzed for each SES group. See Table 17 for the means and standard deviations for this analysis.

Table 17

*Second Grade TRC Scores Test Time x SES*

| Test Time | *SES Level* | *Mean* | *Standard Deviation* | *n* |
|---|---|---|---|---|
| BOY TRC | H | 16.85 | 8.94 | 164 |
| | M | 13.94 | 7.76 | 268 |
| | L | 12.32 | 8.16 | 342 |
| MOY TRC | H | 21.41 | 8.50 | 164 |
| | M | 19.64 | 8.29 | 268 |
| | L | 18.22 | 9.57 | 342 |
| EOY TRC | H | 27.89 | 9.16 | 164 |
| | M | 26.92 | 9.37 | 268 |
| | L | 26.26 | 9.97 | 342 |

*Note.* Beginning of year = BOY, Middle of year = MOY, and end of year = EOY.

The differences between the means were each greater than Tukey's HSD critical value of 1.48 ($\alpha = .05$) and were, therefore, statistically significant. The growth for high SES mean TRC scores from the beginning of year to middle of year was 4.56 and the growth from the middle of year to end of year was 6.48, both of which were greater than the critical value of 1.48. The growth for middle SES mean TRC score from the beginning of year to middle of year was 5.70 and the growth from the middle of year to end of year was 7.28. The growth for low SES mean TRC score from beginning of year to middle of year was 5.91 and the growth from middle of year to end of year was 8.04. See Regardless of socio-economic status, students appeared to have grown approximately

the same amount from beginning of year to middle of year and middle of year to end of year. Hypothesis six was supported.

Table 18

*Second Grade Growth in TRC Scores and SES*

| SES Status | Testing Period | Growth |
|---|---|---|
| High SES | BOY to MOY | 4.56 |
| | MOY to EOY | 6.48 |
| | BOY to EOY | 11.04 |
| Middle SES | BOY to MOY | 5.70 |
| | MOY to EOY | 7.28 |
| | BOY to EOY | 12.98 |
| Low SES | BOY to MOY | 5.91 |
| | MOY to EOY | 8.04 |
| | BOY to EOY | 13.92 |

*Note.* Tukey's HSD = 1.478. Beginning of year = BOY, Middle of year = MOY, and end of year = EOY.

RQ 7: To what extent is there a difference in the change in growth of kindergarten TRC scores between students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year implementers of phonemic awareness instruction?

H 7: There is a statistically significant difference in student reading achievement as measured by the TRC for kindergarten students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year

implementers of phonemic awareness instruction across all three data points (beginning of year, middle of year, end of year).

A two-factor (kindergarten grade TRC scores) ANOVA was utilized to determine which pairs of means in the interaction effect were statistically different for TRC scores among beginning-of-year, middle-of-year, and end-of-year data points and years of implementation (one year or two years). The two categorical variables used to group the students' scores were test time (beginning of year, middle of year, end of year) and years of implementation (one year or two years). The two-factor ANOVA can be used to test the hypothesis, including a main effect for test time, main effect for length of implementation, and a two-way interaction effect (test time x length of implementation). The interaction effect for test time by length of implementation was used to test hypothesis seven. The results of the analysis indicated no statistical significant difference between at least two of the nine means ($F = 0.15$, $df = 2, 1538$, $p = 0.99$). It was concluded that no post hoc was warranted. Hypothesis seven was rejected.

RQ 8: To what extent is there a difference in the change in growth of first grade TRC scores between students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year implementers of phonemic awareness instruction?

H 8: There is a statistically significant difference in student reading achievement as measured by the TRC for first grade students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year implementers of phonemic awareness instruction. The two categorical variables used to group the students' scores were test time (beginning of year, middle of year, end of year)

and years of implementation (one year or two years). The two-factor ANOVA can be used to test three hypotheses, including a main effect for test time, main effect for length of implementation, and a two-way interaction effect (test time x length of implementation). The interaction effect for test time by length of implementation was used to test hypothesis eight.

A two-factor (first grade TRC scores) ANOVA was utilized to determine which pairs of means in the interaction effect were statistically different for TRC scores among beginning-of-year, middle-of-year, and end-of-year data points and years of implementation (one year or two years). The results of the analysis indicated no statistical significant difference between at least two of the nine means ($F$ = 134, $df$ = 2, 1512, $p$ = 0.87). In was concluded that no post hoc was warranted. Hypothesis eight was rejected.

RQ 9: To what extent is there a difference in the change in growth of second grade TRC scores between students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year implementers of phonemic awareness instruction?

H 9: There is a statistically significant difference in student reading achievement as measured by the TRC for second grade students in schools that are first-year implementers of phonemic awareness instruction and schools that are second-year implementers of phonemic awareness instruction. The two categorical variables used to group the students' scores were test time (beginning of year, middle of year, end of year) and years of implementation (one year or two years). The two-factor ANOVA can be used to test three hypotheses, including a main effect for test time, main effect for length

of implementation, and a two-way interaction effect (test time x length of implementation). The interaction effect for test time by length of implementation was used to test hypothesis nine.

A two-factor (second grade TRC scores) ANOVA was utilized to determine which pairs of means in the interaction effect were statistically different for TRC scores among beginning-of-year, middle-of-year, and end-of-year data points and years of implementation (one year or two years). The results of the analysis indicated no statistical significant difference between at least two of the nine means ($F = 146$, $df = 2, 1544$, $p = 0.87$). It was concluded that no post hoc was warranted. Hypothesis nine was rejected.

**Summary**

Chapter four reported the outcomes of the ANOVAs used to determine if phonemic awareness instruction resulted in statistically significant growth in reading achievement as measured by the TRC. Results of the hypothesis tests indicated that the implementation of phonemic awareness instruction had a statistically significant impact on reading growth for students in kindergarten through second grade in the River Bluffs School District. Results also indicated that students of all socio-economic backgrounds had statistically significant growth in reading achievement for students in kindergarten through second grade. Finally, the amount of years of phonemic awareness instruction implementation did not have statistically significant effects on student reading achievement. Chapter five reports major findings of hypothesis testing, describes the relationship of this study's results to literature, discusses implications for action, and provides recommendations for future study.

# Chapter Five

## Interpretation and Recommendations

The first chapter of this research study introduced the background, purpose, and significance of the study; chapter two contained a review of literature on the theoretical frameworks of reading instruction, the history of reading instruction in America, the five components of reading (phonemic awareness, phonics, fluency, vocabulary, and comprehension) and concluded with research on poverty and reading achievement. Chapter three described the research methods, the TRC reading assessment, and running records. Chapter four provided the results of hypothesis testing related to the research questions. Chapter five presents an overview of the problem, purpose, research questions, methodology, and major findings of the study. In addition, findings related to relevant literature on reading instruction and achievement, implications for actions, and recommendations for future research are addressed.

### Study Summary

According to Roberts (2004), the study summary serves as a "mini-version" of chapters one through four of the study. Therefore, this section provides an overview of the problem, the purpose statement, the research questions, methodology, and a presentation of the major findings of the study.

#### Overview of the Problem.

Many school districts face an urgency to meet No Child Left Behind mandates to achieve adequate yearly progress benchmarks. Sanctions and accountability measures in the form of funding, staffing, and professional development dollars all depend on the results of standardized testing (Ravitch, 2007). Rising levels of poverty in the River

Bluffs School District continue to impact the NCLB identified free and reduced lunch subgroups. In order to better prepare students for success in reading and writing as well as facilitate growth in meeting NCLB requirements, the River Bluffs School District implemented a new reading component called phonemic awareness. However, the new implementation of phonemic awareness instruction had not been analyzed for its effectiveness and impact on TRC growth for all students, in particular, the students of all socio-economic backgrounds in kindergarten through second grade.

**Purpose Statement and Research Questions.**

This study was designed to examine the reading growth of students from all socio-economic backgrounds enrolled in kindergarten through second grades who were receiving phonemic awareness instruction and attending schools in various stages of phonemic awareness instruction implementation (one year or two years) in the River Bluffs School District. Research questions one through three examined the growth of student TRC reading scores over three testing points. Research questions four through six examined the growth of student TRC scores by their SES status over three different testing points. Finally, research questions seven through nine examined the growth of student TRC scores by the amount of time phonemic awareness instruction had been implemented in each elementary school (one year or two years) in the River Bluffs School District.

**Review of the Methodology.**

This study included a sampling of 3,375 students' Text Reading Comprehension (TRC) scores. The three variables in this study included testing points (beginning of year, middle of year, end of year), SES status, and years of implementation. One-factor

ANOVAs were used to analyze the research questions one through three to determine if statistically significant differences in student TRC growth existed in kindergarten, first grade, and second grade students. Tukey's HSD was utilized for follow-up post hoc analyses. Two-factor ANOVAs were used to address the research questions four through six to determine the interaction effect between TRC growth and SES status (high, middle, low) for kindergarten, first grade, and second grade students. Again, Tukey's HSD was utilized for follow-up post hoc analysis. Finally, two-factor ANOVAs were used to address research questions seven through nine, examining the interaction effect between TRC growth and years of implementation (one year or two years) for kindergarten, first grade, and second grade students. Tukey's HSD was not warranted for follow-up post hoc analysis because no statistical differences were found.

**Major Findings.**

The findings indicated that phonemic awareness instruction resulted in statistically significant growth in reading scores for students in kindergarten, first, and second grades. Additionally, results indicate that phonemic awareness instruction resulted in statistically significant growth for students of all socio-economic backgrounds (high, middle, low) and at all data points (beginning to middle, middle to end, and beginning to end) regardless of socio-economic status. Lastly, there were no significant differences in reading growth between students who had received one or two years of phonemic awareness instruction.

## Findings Related to the Literature

Comparing and contrasting the results of this study to the studies presented in chapter two revealed similarities and differences. The results of this study provided

evidence that phonemic awareness instruction had a significant influence on reading growth. The results from this study support the research conducted by leaders in the field of reading education, which stated that phonemic awareness instruction is highly effective instruction for reading development and achievement (Adams, 1990; Chall, 1967; and NRP, 2000). The same results were published in the 2000 report of the National Reading Panel. The National Reading Panel reported students made significant reading gains due to phonemic awareness instruction. Phonemic awareness was identified as one of the five scientifically researched-based components of reading, the other four components include instruction in phonics, fluency, vocabulary, and comprehension. The NRP (2000) research is further supported in Hattie's (2009) meta-analysis on learning, in which he classified phonemic awareness instruction in the highest zone of desired effects. Finally, the researchers who laid the foundation for modern research in phonemic awareness—Adams (1990); Chall (1967); Snow, Burns, and, Griffin (1998); and Stanovich (1988) —all found that phonemic awareness was vital to reading success. Nevertheless, the National Reading Panel (2000) and other researchers such as Fountas and Pinnell (1996) agreed that phonemic awareness was simply one component of reading and should not alone become a reading program. Due to the widely held belief that phonemic awareness is beneficial to reading instruction for students, it is now no longer the question of whether or not to teach phonemic awareness but rather how it should be taught. Behaviorists, supported by Hattie's (2009) meta-analysis, found that direct teaching yielded the highest reading gains; however, researchers supporting the balanced approach to reading still believe that phonemic awareness and the other four components of reading are best taught using a combination

of direct and indirect teaching methods (Fountas & Pinnell, 1996). The River Bluffs School District believes in the balanced approach to literacy instruction, which includes phonemic awareness as one component of reading instruction through direct and indirect instruction.

Additionally, phonemic awareness was found to be effective for students from high, middle, and low socio-economic backgrounds by the National Reading Panel (2000). Again, the NRP (2000) research was conducted to answer how students of low SES best learn to read. Chall (1967) found that low SES students learn best from direct instruction with an emphasis in code-based teaching methods. Regardless of SES, phonemic awareness seems to have transcended the barriers of poverty and the inclusion of phonemic awareness indicated significant gains for all students. Direct, explicit instruction in phonemic awareness in this study was shown to result in growth equal to that of middle and high SES backgrounds. These results are supported by research and theories grounded in Behaviorism and Information/Cognitive processing models. The NRP (2000), Hattie (2009), and Chall (1967) all found that students of low SES benefit from phonemic awareness instruction. Hattie and Chall both found that students of low SES also benefited from direct instruction. Chall theorized that students of low SES were dependent on decoding to read and were less able to make meaning. This study suggests that phonemic awareness is a vital component in allowing students of low SES to become more independent in decoding skills, which allows these students of low SES more opportunities to construct meaning and comprehension. This study did not, however, indicate significant growth when implemented more than one year.

## Conclusions

### Implications for Action.

The River Bluffs School District has allocated significant resources in terms of time, funding, professional development, and staffing for the implementation of phonemic awareness instruction. The findings of this study as stated in chapter four, indicated that the current model has contributed to positive results for student growth on the TRC reading assessment in kindergarten through second grade students and for students of all levels of socio-economic backgrounds. Due to the significant growth in TRC scores, this researcher has concluded that the current model of phonemic awareness instruction should continue to be implemented district-wide and further attempts to improve the current model through additional staff and professional development should be considered for approval. The NRP (2000) also indicated that phonemic awareness instruction is highly effective for preschool students. Due to the dramatic reading growth for primary students in this study, it is highly recommends extending phonemic awareness instruction into the preschool curriculum. Other school districts with similar demographics may utilize this study to implement phonemic awareness instruction in their primary classrooms as it was shown to be effective for all primary students of all SES backgrounds.

### Recommendations for Future Research.

While the current study examined the impact of phonemic awareness instruction on the growth of TRC scores for students of all SES backgrounds in kindergarten through second grade and for students attending schools in various stages of implementation (one

year and two years), the following additional research is needed to address the limitations of this research study:

1. Replicate the current study using data from other school districts utilizing phonemic awareness instruction during their first year of district-wide implementation.
2. Replicate the current study using longitudinal data in the River Bluffs School District to assess how TRC growth is impacted over time.
3. Replicate the current study using longitudinal data in the River Bluffs School District to determine if students who received phonemic awareness instruction throughout their years in the primary grades show greater gains on the Missouri Assessment Program, the state standardized test.
4. Replicate the current study to examine the growth of English language learners; other variables such as class size, teacher experience, gender, attendance, and race could also be considered.

**Concluding Remarks.**

This study examined the impact of a district-wide, first-year implementation of phonemic awareness instruction on the growth of primary students' reading scores. The data were analyzed to determine the impact of phonemic awareness instruction on reading growth for grade levels kindergarten through second grade, the impact on students of various socio-economic levels, and the impact of schools implementing phonemic awareness for one year or two years. Analyses revealed statistically significant growth in TRC scores for all grade levels kindergarten through second grade and for all testing periods (beginning of year to middle of year, middle of year to end of year, and

beginning of year to end of year). Additionally, analyses revealed statistically significant growth in TRC scores for students of all socio-economic backgrounds (high, middle, and low). The TRC growth for student SES was found to be significant at every testing period, as well. However, the length of time of implementation did not show significant growth in TRC scores, indicating that whether a school was in its first or second year of implementation did not appear to impact student growth. It will be vital to continue this research in determining the significance of growth for students in the years to come in the River Bluffs School District. In the larger context, this study not only adds to the body of research on reading acquisition but this study also has the potential to impact all students of all SES backgrounds. Nationally, districts have the opportunity to implement phonemic awareness instruction to ensure that every student has the opportunity to become proficient in reading, the fundamental skill necessary not only for academic success but also for economic stability and the positive contributions that literate citizens will make to our global society.

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# Appendix A: IRB Application

BAKER UNIVERSITY

SCHOOL OF EDUCATION
GRADUATE DEPARTMENT

Date: January 3, 2012
IRB PROTOCOL NUMBER _____
(IRB USE ONLY)

IRB REQUEST
**Proposal for Research**
**Submitted to the Baker University Institutional Review Board**

**I. Research Investigator(s)** (Students must list faculty sponsor first)

**Department(s)** **School of Education Graduate Department**

Name Signature

1. Dr. Elizabeth Ann Sanders, Major Advisor _____

2. Margaret Waterman, Research Analyst _____

3. Dr. Judy Favor, PhD, University Committee Member _____

4. Dr. Laura Nelson, External Committee Member _____

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Faculty sponsor: Dr. Elizabeth Ann Sanders
Phone: 913-491-4432
Email: esanders@bakeru.edu

Expected Category of Review: X Exempt ___ Expedited ___Full

**II: Protocol:** The Impact of Phonemic Awareness Instruction on Reading Growth in Pilot and Non-pilot Schools and on Reading Growth in High Socio-economic and Low Socio-economic Schools.

_____

**Summary**

**In a sentence or two, please describe the background and purpose of the research.**

This study analyzes the district-wide implementation of phonemic awareness instruction for students, kindergarten through second grade. The research will examine: 1.) the collective reading growth of schools and grade levels for the first year of implementation, 2.) the collective reading growth of school in the first year of implementation of phonemic awareness and how it differs from buildings in second year of implementation, 3.) and how the collective reading growth in high socio-economic schools differs from the collective reading growth in low socio-economic schools.

Students in this research attend a small urban school district in Missouri with a student population of approximately 11,000. The district is comprised of 55.7% of students who qualify for free and reduced lunch of which 83.2% white; 9.7% black; and 5.8% Hispanic.

As poverty continued to rise, based on the number of students on free and reduced lunch, and with the new research from the National Reading Panel (NRP) in 2003, it became clear to the administrators and teachers in the district chosen for this study that new reading instructional strategies needed to be implemented. In 2009, five elementary pilot schools were selected to pilot phonemic awareness instruction and interventions. In 2010, full implementation of phonemic awareness instruction and interventions went district-wide.

**Briefly describe each condition or manipulation to be included within the study.**

There are no conditions or manipulations.

**What measures or observations will be taken in the study? If any questionnaire or other instruments are used, provide a brief description and attach a copy.**

No questionnaires will be used in this study. Archived data for Text Reading (TRC) scores will be analyzed.

All measures will be from the Text Reading Comprehension (TRC) assessment. Data will be obtained from both the mClass®: Reading 3D™ database for the school district participating in the study and the assessment database of the selected school district. Data for the 2009-2010 school year for schools in their second year of phonemic awareness implementation and data and the 2010-2011 data for all elementary schools will be imported into SPSS. This data will include the three TRC data points (beginning of year, middle of year, end of year), grade level, school, and socio-economic status. Multiple one sample *t* tests were used to examine the reading growth of kindergarten, first grade and second grade students between test time one and test time two, test time two and test time three, and test time one and test time three. Multiple independent

sample *t* tests were used to examine the difference between low SES and high SES kindergarten, first grade, and second grade students' reading growth between test time one and test time two, test time two and test time three, and test time one and test time three. Multiple independent sample *t* tests were used to examine the reading growth between test time one and test time two, test time two and test time three, and test time one and test time three for students in kindergarten, first grade, and second grade between schools with one year of phonemic awareness implementation and schools with two years of phonemic awareness implementation.

**Will the subjects encounter the risk of psychological, social, physical or legal risk? If so, please describe the nature of the risk and any measures designed to mitigate that risk.**

There is no risk of psychological, social, physical, or legal risk.

**Will any stress to subjects be involved? If so, please describe.**

There is no risk of stress to any of the subjects involved.

**Will the subjects be deceived or misled in any way? If so, include an outline or script of the debriefing.**

The subjects will not be deceived or misled in any way.

**Will there be a request for information which subjects might consider to be personal or sensitive? If so, please include a description.**

I will be requesting student TRC scores (reading data). However, this data will not be reported with student names. Names will be replaced with identifying numbers.

**Will the subjects be presented with materials which might be considered to be offensive, threatening, or degrading? If so, please describe.**

The subjects will not be presented with material that may be perceived as offensive, threatening, or degrading.

**Approximately how much time will be demanded of each subject?**

No time will be demanded of the subjects. Archived data will be used for the study.

**Who will be the subjects in this study? How will they be solicited or contacted? Provide an outline or script of the information which will be provided to subjects prior to their volunteering to participate. Include a copy of any written solicitation as well as an outline of any oral solicitation.**

The subjects will be students, kindergarten through 2nd grade. No solicitation will be made, as scores will be reported without student names by school. Data will be obtained from the school district's data reporting system as well as the mClass®: Reading 3D™ database.

**What steps will be taken to insure that each subject's participation is voluntary? What if any inducements will be offered to the subjects for their participation?**

No voluntary participation is involved.

This study will utilize archived data from the 2009-2010 school year for participating pilot schools and the 2010-2011 archived assessment data for all elementary schools in the selected district. This will be pulled from both the school district's assessment database and the mClass database.

**How will you insure that the subjects give their consent prior to participating? Will a written consent form be used? If so, include the form. If not, explain why not.**

No permission is needed from the subjects. Permission for access to archived data has been given by the selected school district, see appendix A.

**Will any aspect of the data be made a part of any permanent record that can be identified with the subject? If so, please explain the necessity.**

No data used will accompany a student's permanent record beyond that of the school district's assessment database. None of the reported data in this study will be attached to student names.

**Will the fact that a subject did or did not participate in a specific experiment or study be made part of any permanent record available to a supervisor, teacher or employer? If so, explain.**

There will be no permanent record of who participated in this study.

**What steps will be taken to insure the confidentiality of the data?**

Student data will be accessed from the school district's assessment database. Individual students will not be identified or named. Scores will be analyzed by building and grade level only.

**If there are any risks involved in the study, are there any offsetting benefits that might accrue to either the subjects or society?**

There are no risks involved in this study.

**Will any data from files or archival data be used? If so, please describe.**

All data utilized in this study will be archival data from the school district's assessment database and mClass®: Reading 3D™.

## Appendix B: IRB Approval

BAKER UNIVERSITY
Own Confidence

February 7, 2012

Jasmine Briedwell
2403 Shamrock Lane
St. Joseph, MO 64505

Dear Ms. Briedwell:

The Baker University IRB has reviewed your research project application (M-0126-0131-0207-G )and approved this project under Exempt Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

The Baker University IRB requires that your consent form must include the date of approval and expiration date (one year from today). Please be aware of the following:

1. At designated intervals (usually annually) until the project is completed, a Project Status Report must be returned to the IRB.
2. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
3. Notify the OIR about any new investigators not named in original application.
4. Any injury to a subject because of the research procedure must be reported to the IRB Chair or representative immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform Office of Institutional Research (OIR) or myself when this project is terminated. As noted above, you must also provide OIR with an annual status report and receive approval for maintaining your status. If your project receives funding which requests an annual update approval, you must request this from the IRB one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

Carolyn Doolittle, EdD
Chair, Baker University IRB

## Appendix C: Mean TRC Scores for All Students at All Three Testing Times

Table C1

*Increases in Mean TRC Scores at Three Testing Times*

| Grade | *1* | *2* | *3* | *n* |
|---|---|---|---|---|
| K | 1.32 | 3.22 | 4.54 | 771 |
| 1 | 4.90 | 8.53 | 13.43 | 758 |
| 2 | 5.55 | 12.99* | 12.99* | 774 |

Note. 1 = beginning of year to middle of year, 2 = middle of year to end of year, 3 = beginning of year to end of year.

* $p < 0.05$

Table C2

*Mean Scores at Three Testing Times*

| Grade | *BOY* | *MOY* | *EOY* | *BOY to EOY* |
|---|---|---|---|---|
| K | 0.11 | 1.42 | 4.56 | 4.54 |
| 1 | 3.58 | 8.48 | 17.01 | 13.43 |
| 2 | 13.84 | 19.39 | 26.83 | 12.99 |

Table C3

*Mean Scores at Test Times by SES School*

| Grade | *SES* | *BOY* | *MOY* | *EOY* | *BOY to EOY* |
|---|---|---|---|---|---|
| K | H | .10 | 1.86 | 5.42 | 5.32 |
| | M | .06 | 1.42 | 4.73 | 4.66 |
| | L | .16 | 1.25 | 4.27 | 4.11 |
| 1 | H | 4.74 | 10.66 | 19.42 | 14.68 |
| | M | 3.95 | 8.08 | 15.41 | 11.46 |
| | L | 2.78 | 7.82 | 17.17 | 14.39 |
| 2 | H | 16.85 | 21.41 | 27.89 | 11.04 |
| | M | 13.94 | 19.64 | 26.92 | 12.98 |
| | L | 12.32 | 18.22 | 26.26 | 13.94 |