California State University,

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RESPONSE TO INTERVENTION AND READING OUTCOMES

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By

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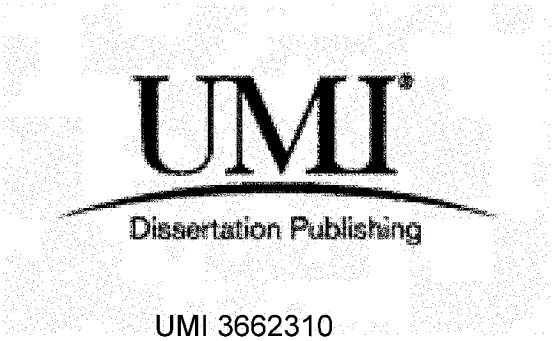

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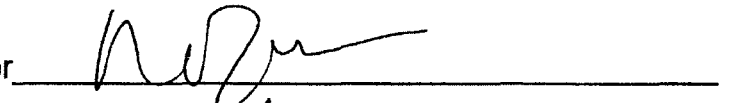
Professor 

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ABSTRACT

Schools today continue to intensify the need to find effective interventions for students who are at risk for reading failure. Many have turned to a multi-tiered Response to Intervention (RtI) model to provide reading interventions that will assist educators in improving reading outcomes. This one-group pretest-posttest design study examined the relationship between participation in RtI reading intervention and reading outcomes among 117 students grouped in a Tier 2 reading intervention. Using Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Next reading assessment composite scores, I analyzed reading change for three benchmark time periods for the 2012-2013 school year. Results from descriptive statistics, *t*-test measures, and a multiple regression analysis produced positive results. The majority of students (95%) participating in a Tier 2 reading intervention demonstrated statistically significant growth in reading outcomes with a reading change mean of 95.93 points regardless of their gender, English learner status, or free and reduced-price lunch status. Improvement in reading outcomes occurred in all three designated time periods measured. This quantitative study indicates that the majority of students who participated in RtI reading interventions improved reading outcomes from the beginning of the year to the end of the year and made gains in closing the achievement gap for reading.

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DEDICATION

To my loving husband, Fred, my soul mate and champion,

who always allows me to grow and learn beyond my expectations.

To my two amazing children, Joshua and Corey, who have grown up to be great individuals who will truly make a difference in our world.

To my parents, George and Nancy, who encouraged me to aim high, get the most schooling possible, and never give up on my dreams.

I love you all!

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CHAPTER 1

INTRODUCTION

If children do not learn to read well by the end of third grade it is not likely they will be able to catch up with their peers. The National Institute for Literacy (2008) states that although the United States is considered a highly literate country, many children slip through the education system having a particularly difficult time learning to read. Literacy skills are especially important for the individual as well as the society. Those individuals with higher degrees of literacy are more likely to complete their education and secure higher paying jobs. Higher literacy in individuals leads to higher self-esteem and a greater likelihood of participating in the community. The development of successful reading skills at an early age has an impact on economic and social realms of our society (National Institute for Literacy, 2008; National Reading Panel, 1999; Zeece, 2006).

Background of the Problem

This chapter provides an introduction to and overview of the dissertation. There are three key issues that define the background of the problem addressed by this research: (a) increased accountability for academic achievement in American public schools, (b) the significance of reading, and (c) the need for interventions to be implemented to improve reading outcomes and achievement. The background of the problem is followed by the problem statement, the

purpose of the research, and the study's significance. Research questions, definitions of terms, and the limitations of the study follow. The chapter concludes with an overview of the proposal.

Increased Accountability

Accountability for achievement in American public schools has a long history beginning with the launching of Sputnik in 1957. That event marked changes in the world and the perceived need for the federal government to involve itself in educational curriculum (Ellis, 2007). Early on, one of the most important and influential studies initiating questions about our nation's schools was the Equality of Educational Opportunity (EEO) study, commonly known as the Coleman Report of 1966 (Haller & Kleine, 2001). Almost 20 years later, the publication of *A Nation at Risk* in 1983 led to additional increased political attention and scrutiny of American public schools. Americans made fundamental changes in the way they thought about public education when this document was released from President Reagan's National Commission on Excellence in Education (Borek, 2008; Deville & Chalhoub-Deville, 2011). It provoked a national discussion about the quality and purpose of education.

There were four findings and recommendations identified in *A Nation at Risk* related to content, expectations, time, and teaching. The central theme of the report was the need to improve curriculum, or what students learn. This involved the fundamentals of scope and sequence. As a result, high school graduation requirements were strengthened. These became the new basics for students' requiring higher expectations, more time for each subject area, and

higher quality teaching (Hewitt, 2008). The commission recommended the pursuit of equity and excellence in public education, shifting from minimum standards to high standards (Borek, 2008). The findings and recommendations ignited waves of reforms during the 1990s, including President Clinton's signing Goals 2000 into law and pushing for the establishment of national standards and testing (Deville & Chalhoub-Deville, 2011; Granger, 2008; Hewitt, 2008). A quarter of a century later these reforms led to the current No Child Left Behind Act (NCLB) of 2001. NCLB, which included mandated state standards and assessments, became President George Bush's version of an accountability system (Hewitt, 2008; Hunt, 2008; Deville & Chalhoub-Deville, 2011).

Three distinct educational movements during the 1980s led to the implementation of NCLB: the excellence, restructuring, and standards movements. The standards movement embedded in NCLB was the most profound of the reforms for educators. Improving teaching and learning became the central concern of educators as the American public demanded more intense reforms to improve academic performance in public schools. The movement redirected the focus from teaching activities to achievement of students. Its principal emphasis was on improving academic performance by improving teaching and learning (Hunt, 2008).

When NCLB was enacted in 2002 its goal was to ensure that all children have a fair, equal, and considerable opportunity to gain a high-quality education and reach minimum proficiency on challenging academic state standards (No Child Left Behind [NCLB], 2002; Rush & Scherff, 2012). With this defining

purpose, all students, including those with disabilities, were included in state assessment and accountability systems (Lazarus, Thurlow, Lail, & Christensen, 2009). Improving reading and math for all children by raising achievement became the priority in NCLB's high-stakes accountability policy. In addition, the goal was to narrow the gap between disadvantaged, low-achieving, and minority students and their peers (Lee & Reeves, 2012). The goal of NCLB—to close the achievement gap and "leave no child behind"—was considered worthwhile and admirable (Ellis, 2007, p. 232).

The focus on improved student learning brought about in NCLB acted as a call to action to hold all public school students to the same challenging academic content and achievement standards . . . all children were expected to achieve high levels of learning (Rush & Scherff, 2012). NCLB set the stage for improvements in recent years by focusing on data-based decision making and accountability. Requirements included that states report disaggregated student test scores, and this exposed serious deficiencies among many of the country's most vulnerable students (Henderson, 2012). NCLB in 2002 and the reauthorization of IDEA in 2004 mandate that children have access to effective, scientifically based instructional strategies and academic content (Case et al., 2010; Ellis, 2007).

Significance of Reading

Success in school is practically synonymous with success in reading. Reading has been identified as one of the most valued skills in the nation and is reported to impact a student's achievement in all areas; lack of reading skills can

adversely affect a student's ability to access the general education curriculum (Earles-Vollrath, 2012; Stewart, Benner, Martella, & Marchand-Martella, 2007). Reading failure of children in early grades is costly to the education system in terms of special education, retention, delinquency, and remediation. In addition, low reading skills are often associated with dropout rates and unemployment, which negatively affect the entire society (Chambers et al., 2011; Cummings, Kaminski, Good, & O'Neil, 2011). With a high social and financial benefit to society and the expectations of NCLB, reading has become a primary concern for educators. Many states have adopted accommodation policies that would help level the playing field for students, especially those who struggle in reading (Lazarus et al., 2009). Those accommodation policies include early identification and intervention for all children at risk for reading failure, high standards for all, and the use of reading materials and instructional strategies that are scientifically based (National Reading Panel, 1999).

NCLB includes the goal of establishing reading programs for students in kindergarten through third grade based on scientific reading research to ensure that students read at or above grade level by the third grade (NCLB, 2002). The high expectations and rigorous standards set by NCLB mandates require educators to accelerate reading achievement.

According to Pruisner (2009), current regulations in NCLB to improve reading scores have changed the way educators teach and deliver reading models. In an effort to provide a new standard of performance known as data-driven student achievement, NCLB narrowed the view of reading, pitting skills-

based instruction against comprehension-based instruction and requiring five areas of beginning and developmental reading as determined by scientifically based reading research. The five areas for reading success as outlined in NCLB, which are also the core of the Reading First Program, include phonics, phonemic awareness, fluency, vocabulary, and comprehension.

For the past 40 years there has been an intense effort to study reading difficulties and accelerate reading outcomes for students with learning disabilities and students deemed "at-risk" (Richards, Pavri, Golez, Canges, & Murphy, 2007). Struggling readers experience significant difficulty catching up with their peers. According to researchers, the gap between struggling and proficient readers can be reduced (Chard et al., 2008; Cummings et al., 2011). Prior research indicates that educators can expect as many as 95% of students to reach adequate reading proficiency (Knutson, Simmons, Good, & McDonagh, 2004). Although the National Reading Panel provides educators with a blueprint for effective reading instruction as traditionally delivered in the general education classroom, there remains a subgroup of students who struggle and are in need of intervention (Case et al., 2010; Lipson, Chomsky-Higgins, & Kanfer, 2011). The National Assessment of Educational Progress reported in 2011 that two thirds of fourth grade students across the nation did not read at grade level and have difficulty catching up with their peers (Cummings et al., 2011).

Under NCLB, educators are held accountable for the academic performance of all children in public schools, especially low-performing students, such as children in special education, English learners, low socio-economic

status and those in need of reading assistance (Samuels, 2007). With increased emphasis on standardized testing and the threat of imposed sanctions, public schools continue to search for ways to improve reading, intensifying the need for reading remediation, targeted assessments, and intervention. Interventions must address the underlying difficulties in order to help improve reading (Murray, Munger, & Clonan, 2012; Ortlieb, Grandstaff-Beckers, & Cheek, 2012).

A Need for Interventions

Educators continue to struggle with how to meet the needs of individual learners. Students who are not making appropriate gains when provided scientifically based reading instruction in the classroom need more intensive intervention. However, the nature and efficacy of these interventions are not clearly defined in the research. Researchers have identified several interventions, such as more time, smaller group size, more opportunities for practice, explicitness of instruction with a step-by-step process, and reduction in the number of components taught (Harn, Linan-Thompson, & Roberts, 2008). A heightened interest in the Response-to-Intervention (RtI) model emerged because of its inclusion in the 2004 reauthorization of Individuals with Disabilities Education Act (IDEA), and it has been called a notable reform (Sparks, 2011). RtI aims to provide early intervention for at-risk learners and promote more valid identification of children with learning disabilities while accelerating academic achievement in reading and intensifying instruction (Fuchs, Compton, Fuchs, Bouton, & Caffrey, 2011).

A single definition of RtI has yet to be determined, and meaningful differences exist among models and implementation (Burns, Appleton, Stehouwer, 2005). Initial research on RtI indicates that this framework allows schools to organize resources to identify, assess, and support all students academically (Simonsen et al., 2010). In its simplest form, RtI has been defined as a method of determining if a child responds to scientific, research-based interventions (Kerins, Trotter, & Schoenbrodt, 2010). One goal of RtI is to shift resources to deliver and evaluate instruction that works for students thus redirecting the classification of students as having disabilities. Some students who are labeled with a reading disability may have struggled with reading in early grades and received ineffective instruction in reading. RtI is designed to be a prevention model that reduces inappropriate referral and identification in special education. When implemented correctly, the percentage of students with academic difficulties is reduced, according to a recent study (Wanzek & Vaughn, 2011).

School districts all over the country are implementing a hierarchical, tiered RtI model to address the varying needs of students (Sparks, 2011). States are increasingly moving toward RtI implementation, with 47 out of 50 states having developed a model of RtI, or are in the process of doing so to curb the over identification of students in special education and to address the needs of the struggling student. However, questions remain about the efficacy of RtI (Chard & Linan-Thompson, 2008). Little or no research has been done to measure the success of RtI frameworks (Hughes & Dexter, 2011). There is a consensus about

the need to implement early intervention strategies to assist struggling learners and to abandon the previous "wait to fail" methods, but there are still many unanswered questions about RtI. Kame'enui (2007) has reflected that RtI was both timely and premature. It is timely due to the nature of the language, purpose, and application of the law in regard to identifying students with a learning disability. RtI is a new construct, and it changes the way educators think and practice identification for special education. The implementation of RtI without proper discourse or establishment of common practice makes it premature, however. There is still a need for rigorous research on RtI interventions to determine if they are empirically sound and hold promise for practice in special education.

Problem Statement

The problem this study will address is the need for empirical research on the efficacy of RtI interventions. Interventions must be implemented correctly and monitored frequently to be effective (VanDerHeyden, Witt, & Gilbertson, 2007). Specialists and educators have been using the RtI approach in recent years as a supplement to general education without evidence of success or application with fidelity (Hughes & Dexter, 2011). In fact, intervention models are important since recent findings from a report on assessment and instructional practices revealed that teacher candidates were often inadequately prepared to assess the essential components of children's reading, with more than one third of those surveyed indicating that they did not know how to administer and interpret screening and diagnostic measures designed to identify children "at risk" for reading failure or

how to use the results of those assessments to improve instruction (McCombes-Tolis & Swerling, 2011).

Purpose of the Research

The purpose of this study is to examine the relationship between RtI implementation and student reading achievement. Using a multilevel design to study third-grade elementary reading scores in a suburban Southern California school district, I sought to determine whether recently adopted and implemented RtI models have been effective in raising reading scores as measured by Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Next reading assessments and California State Standards Tests. Since 2008, students and teachers have participated in a district model of RtI. This move to RtI represents a paradigm shift to improve student performance for all students, using data-driven instruction as the new norm (Bianco, 2010; Kame'enui, 2007). The goal of the district RtI model is to raise reading scores for all students who are considered at-risk, along with raising scores of their peers. This study seeks to determine the efficacy of the specific, three-tiered RtI model being implemented in the identified district.

Significance of the Study

This research is important and will make a significant contribution to educational leadership because previous research documenting the efficacy of RtI is minimal. Some studies indicate the consistent use of an RtI model has produced several results, including improved student outcomes in literacy, declining rates of referrals to student study teams for assessment, a decrease in

the number of students identified for special education, and positive feedback from teachers who worked with the RtI model (Bianco, 2010; Richards et al., 2007). However, randomized, controlled studies of an entire RtI model are lacking. Proponents of RtI report they have absolute confidence that RtI works. According to M. K. Burns, associate professor at the University of Minnesota in Minneapolis, people are taking what was intended to be an early intervention and prevention model and trying to make it a diagnostic model (Burns et al., 2010). Part of the intent was to help identify students with disabilities, and now it is being used on a whole-scale model and adopted as data-based school reform (Sparks, 2011).

This study used a one group pretest-posttest design to study the efficacy of an RtI model and to fill a gap in the research by focusing specifically on assessment scores in the area of reading by using two measures and accounting for nesting of students in schools within the district. I have particular interest in this area primarily because of my involvement in piloting and implementing several intervention programs and strategies to close the achievement gap, both as a teacher and administrator. Throughout my career in education, reading and improving reading achievement has been a passion because mastery of that skill is imperative if students are going to be prepared for the workforce and become productive members of society.

In recent years, with the implementation of NCLB, I have been directly involved and accountable as an educational leader in facilitating gains in struggling students' reading scores and improving the reading performance of all

students overall. RtI is of particular interest to me because I was on the original district steering committee and was a leader in formulating the district RtI plan in 2008. This steering committee researched, designed, piloted, adjusted, and implemented the district RtI model. After five years, I hope to determine the effectiveness of the RtI implementation and to examine the benefits the program offers and the challenges that remain.

This research will make a significant contribution to the literature to help guide educational leaders in using data in their decision making for implementing interventions and programs. The RtI implementation in this study is a specifically designed reading intervention program and is costly. With many programs and intervention opportunities in the field of education designed to improve reading scores, educators need to have current and relevant information from recent research to determine if the costs of newly adopted and implemented programs are sustainable and provide long-term benefits for improving academic success in reading. As resources continue to be maximized because of the economic recession and fiscal constraints in the state of California, it is critical that educators implement the most effective programs that will improve student learning and make a difference in reading outcomes.

Research Questions

The research questions this study investigated are:

1. What are the changes in reading outcomes for students who participated in a year-long Tier 2 RtI reading intervention?

2. Are there differences in outcomes for students who participated in a year-long Tier 2 RtI reading intervention for the three benchmarks?
3. After controlling for student demographics (gender, English learner status, and free and reduced-price lunch status), what is the effect of RtI on reading outcomes for those students in Tier 2 reading intervention?

Definitions of Terms

Academic Performance Index (API) is a numerical performance index based on several factors, weighted heavily on reading and math assessments, indicating a school's overall performance (Lazurus et al., 2008). NCLB requires that all students be included in state assessments and accountability systems.

Response to Intervention (RtI) is a process used to determine whether a child responds to scientific, research-based intervention or has a specific learning disability due to their lack of response to the intervention. RtI can be considered a change in behavior or performance as a function of the intervention (Kame'enui, 2007; Richards et al., 2007).

Scientifically based instructional practices are grounded in thorough scientific research that is empirically based (Richards et al., 2007; Kame'enui, 2007).

Tiered-level instruction is a three-level RtI reading intervention. The first level consists of the core; the second level is targeted, systematic intervention for small groups of students several times a week; and the third level is a more

intensive intervention conducted for 45-60 minutes each day (Richards et al., 2007).

Limitations of the Study

Delimitations

The participants in this study were selected from among 1,841 third-grade elementary school students attending 21 schools in a K-12 suburban school district in Southern California. Data was collected for all third-grade students who participated in the Tier 2 level or strategic intervention, including those attending six Title I and 14 non-Title I schools. The district is considered a high-performing district in a middle to upper middle class income area. Standardized test scores for the district, as measured by the state's API, have risen each year (859 in 2012). All students in elementary schools across the district participated in the RtI implementation for reading for the past 5 years. Training for staff began in 2008 and continued for the next 2 years. No formal training has occurred in the past 3 years. This population was chosen due to the convenience of accessing the achievement data, future interest in the outcome, and relevance to high-stakes accountability for students who are identified as struggling readers. These results may apply to districts with similar settings and a similar three-tiered model of RtI. However, districts using different models of RtI and with heavy populations of English learners and socioeconomically disadvantaged students may not find as many similarities in data for their districts.

Limitations

Limitations for this study are two-fold. First, maturation is often described as a limitation when a study takes place over a long period of time. Maturation involves the physiological changes that can occur as the participants become older and develop in different ways. In this study, maturation threats are negligible as a limitation because this research was conducted in a 1-year period which is a normal length of time for measuring student progress. Second, history can be considered a limitation and often affects a study through the wide variety of students involved and their varied experiences. However, in this study participant scores were gathered from all third-grade students in schools across the district regardless of background, ethnicity, socioeconomic status, or other varying factors. This could be a limitation, but all caution was taken to ensure the participants were representative of the population.

Overview of the Dissertation

Chapter 2 provides a review of the relevant research literature. All studies relating to reading interventions, the reading process, and students who struggle with reading and are considered underperforming are reviewed. Chapter 3 presents the research design, methodology, participants, instrumentation, and data collection. Finally, data analysis and validity are discussed. The findings of this research study are reviewed in Chapter 4 with a report of the quantitative data collected and a thorough analysis descriptive data, *t*-tests, and multiple regression. The dissertation concludes with Chapter 5, which provides

interpretations and conclusions along with implications for practitioners and recommendations for future research.

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter is intended to analyze existing literature regarding RtI and the effects is has on academic performance. Literature involving elementary reading components, interventions prior to the rise of RtI, and other literature involving special education identification and qualification was reviewed. This literature review is focused primarily on elementary reading and literature that involves RtI models or interventions that address literacy rather than those RtI models that focus on math or behavior. The literature reviewed for this study involved primary students: kindergarten through third grade. By narrowing the literature search, the most pertinent research aligning with this study was identified and reviewed.

Conceptual Framework

The conceptual framework for this research is grounded in three concepts. The first concept explored is reading instruction, including a focus on reading, the reading process, and the components of an effective reading program. Second, the literature review will examine reading interventions and the RtI models for students who are considered at risk. In this section, literature about reading interventions and how an RtI model is structured will be reviewed. The third section of the literature review will report on a variety of studies related to RtI and how effective RtI is as a reading intervention for elementary students and which

showed both positive and mixed results for elementary children participating in RtI.

Effective Reading Instruction

Reading in the primary grades is essential to learning. Those children who possess low literacy skills by the end of third grade require long-term support, have less access to the regular curriculum, and fall behind their peers in reading achievement and all areas of the curriculum. Low motivation, poor self-esteem, behavioral difficulties, underachievement in academic areas, and reduced opportunities for occupational or economic status are some of the negative ramifications for poor readers (Sloat, Beswick, & Willms, 2007). However, reading ability can be altered through identification and early intervention in primary grades. Effective reading programs and interventions ensure that all children become proficient readers and can dramatically prevent or reduce the number of children who are remedial readers (Sloat et al., 2007; Duffy-Hester, 1999; Allor, Mathes, Roberts, Cheatham & Champlin, 2010).

A Focus on Reading

The gap in reading appears in the early elementary years and is one of the most important issues in education. Educators must ensure that all children are proficient readers by the end of their primary years. Recent studies from NAEP show that over 40% of children nationwide do not meet grade-level standards in reading. This includes children who are disadvantaged, of minority status, and limited English-proficient children. In 2007, NAEP reported that 43% of White students achieved proficient levels on reading assessments while only

14% of African American, 17% of Hispanic, and 8% of American Indian children were proficient. A basic reading program may not be enough for these subgroups of students. Struggling readers will greatly benefit from teachers who provide them with additional support with the fundamentals of reading during regular classroom instruction, along with effective short-term interventions (Chambers et al., 2011; Haager, Dimino & Windmueller, 2007; Hester-Duffy, 1999).

The goal of instruction and reform of the last decade has been "every child a reader" (Allington & Gabriel, 2012, p. 10). Educators often make decisions about instruction that derail the engaged instruction that good readers need. By providing a high-quality instructional reading program, teachers can ensure that every child will read. There are several elements of a high-quality instructional program that should be experienced every day by proficient and struggling readers. First, every child needs to choose something that interests them to read. The more students read, the more they understand and continue to read in later years. Research shows that there is a significant positive relationship between the amount of reading and increased comprehension, vocabulary, and fluency. Fifth-grade readers who were in the 98th percentile rank on standardized tests read as much as 65 minutes per day, while those in the 10th percentile rank read as little as .1 minute per day. According to Krashen's work in 2011, access to self-selected texts improves students' reading performance (Allington & Gabriel, 2012; Honig, Diamond, & Gutlohn, 2000).

Second, every child should be placed in the appropriate level so they can read accurately and understand what they are reading. In order to accelerate

reading and comprehension, students need to be able to read with as much as 98% accuracy. It is important that children not only have the reading materials but also are able to have accurate, intense, and a volume of high-success reading at their instructional level. Reading passages with accuracy and vocabulary at their level will build word recognition, decoding, and word analysis skills. Students who spend a great deal of time with texts they cannot read become more disadvantaged. As they become frustrated by the difficulty of the text, they lose understanding, motivation, and confidence. Since understanding what is read is the goal, teachers must provide materials that are at each child's reading level to build accuracy and comprehension (Allington & Gabriel, 2012).

The third element recommended by researchers is the notion that every child be afforded the opportunity to talk with peers about reading and writing. In addition, they should write about something meaningful and listen to an adult read aloud fluently every day. However, few first-grade teachers read aloud every day in their classroom. Reading aloud fluently and modeling reading increases a student's fluency, comprehension, vocabulary, background knowledge, and awareness. When students talk about reading in a meaningful way by commenting, comparing, analyzing and thinking about what they have read, they demonstrate better outcomes in reading. As little as 10 minutes a day of a conversation about reading improved test scores. Finally, by writing about what they have read through a prompt, not just completing fill-in-the blank worksheets, a child goes through a process of composing their thoughts and putting them into a structure in their writing that improves their reading as well.

This is especially true for struggling readers. Teachers can make a difference in reading outcomes by focusing on these strategies for ensuring that all children read proficiently (Allington & Gabriel, 2012; Honig et al., 2000; Strickland, Ganske, & Monroe, 2002).

The Reading Process

Children begin learning at birth. Researchers report that the most foundational literacy skills are learned before the end of kindergarten and are found to be early predictors of reading success (Simmons et al., 2008). According to Cummings et al. (2011), to ensure that all children are on track for reading, educators must provide early core instruction along with interventions to prevent failure. By ensuring the core reading instruction is a scientifically based curriculum and delivers the components of effective reading instruction, educators will eliminate inadequate instruction as a factor for poor reading progress (Hughes & Dexter, 2011). The Committee on the Prevention of Reading Difficulties in Young Children suggests three essential components to ensure that children do learn to read early and well: (a) provide excellent literacy instruction for all children, (b) allocate supplementary resources and enhanced learning opportunities to at-risk children, and (c) reduce the effect of reading difficulties by providing intense interventions. The most effective literacy instruction applies continuous, systematic monitoring of these early fundamentals (Sloat et al., 2007).

Continuous, systematic monitoring of the early fundamentals of literacy includes several criteria that will determine how reading instruction is delivered.

The first step is to provide a profile of each child's readiness to learn at school. Second, direct assessments must be balanced with classroom-based assessments to provide context. The monitoring system should provide individualized information that clearly captures small increments of change over short periods of time to identify risk factors, inform instruction, and track reading growth. All of the measures should be valid and reliable to allow for comparison of same-age peers at regional and national levels. Finally, educators must follow standardized administrative procedures so that the aggregate data can be used to inform policy and practice in the classroom. By using a monitoring system for literacy as described, students can enter third grade with the reading skills they need to succeed (Sloat et al., 2007).

There has been an abundance of pivotal research on reading instruction in the past 20 years. Experts claim that only 2-5% of students will not learn to read. Cognitive scientists, reading researchers, and neurobiologists now understand more about how the brain works and about language development. All studies have indicated that a thorough, balanced approach to reading is the most effective means to assure reading success. In 1996, researchers Pressley, Rankin, and Yokoi found that teachers who successfully taught reading to kindergarten, first, and second graders used a comprehensive, balanced approach, including both whole language instruction and skills-based phonics instruction. Their approach included a direct teaching of phonemic awareness and phonics, as well as a varied and rich selection of literature (as cited in Honig et al., 2000).

Proficient readers have a typical pattern of success. Most children who are successful readers have average or above average language skills and are very motivated by early childhood experiences with books and literacy. They have been provided rich and purposeful opportunities to identify letters and print and even write their own names. Parents provide successful readers with an opportunity to develop an awareness of the internal structure of language through songs, rhymes, and language play. Adults listen to them, talk with them, and help them become aware of language in all forms. Effective schools where successful readers attend also contribute to their success by making more meaning with print, providing a multitude of opportunities for reading and writing, encourage the joys of literature, and demonstrate the nature of the alphabetic principle (Strickland et al., 2002).

Similarly, those children for whom reading is a difficult task and challenging share characteristics. Knowing that at-risk learners come with variables that impede their progress is valuable to educators since it can help drive instruction. Children who come with a history of preschool language impairment with delays in pronunciation or lack of complex sentences are more at risk in reading, especially if language delays are persistent. When a child has limited proficiency in English or comes from a home where a nonstandard dialect of English is spoken the likelihood of reading difficulty increases. Children with attention problems or hyperactivity disorder, and those with parents who exhibited a learning disability, are considered at higher risk for reading failure. Knowledgeable, skilled teachers are important in the development of reading

skills in children. The reading outcomes are contingent upon the teacher's ability to teach effectively, especially to diverse groups of children or those with a history of learning disabilities (McCombes-Tolis & Spear-Swerling, 2011; Strickland et al., 2002).

The lack of experiences with purposeful and pleasurable reading experiences also contribute to a lack of success in reading. Strickland and colleagues (2002) claim that children from poor neighborhoods or low socioeconomic status families are more likely to struggle with reading than those who come from higher socioeconomic families. Finally, children who attend schools where the classroom practices are ineffective with less time on task, less modeling by the teacher, little guided practice, lower academic expectations, more interruptions, more discipline problems, and less positive reinforcement find it difficult to read proficiently. This aligns with Marzano's (2003) research that identified school-level factors that support reading success: high expectations for student achievement, frequent monitoring of progress, time on task, and school climate (also see Strickland et al., 2002).

Effective Components of Reading Programs

The National Reading Panel, Reading First, and many researchers have replicated findings repeatedly indicating there is an extensive body of knowledge about the skills that children must possess to know how to read well. There are five components typically identified in the research as the building blocks or big ideas for reading:

- Phonemic awareness: The understanding that the sounds of spoken language work together to make words–the alphabetic principle
- Phonics: The relationship between the letters of the written language and the individual sounds of the spoken language
- Decoding and fluency: The ability to read text accurately and quickly–automaticity
- Vocabulary: The words one must know to communicate effectively
- Text comprehension: Understanding what one is reading

These components are aligned with the alphabetic principle, fluency, comprehension, and general reading achievement described in the practice guide for struggling readers published by What Works Clearinghouse and are commonly believed by educators to describe how students learn to read (Haager et al., 2007; Honig et al., 2000; Hughes & Dexter, 2011; Zeece, 2006). It is expected that these are the main features of any literacy program in a general education classroom where high-quality reading instruction and differentiation is provided to all students in the classroom. Regardless of risk factors, such as socioeconomic status or physical impairments, these features influence reading development. Using the above components, the core reading program should provide a "balanced, explicit, and systematic reading instruction that fosters both code-based and text-based strategies for word identification and comprehension" (Gerston et al., 2008, p. 4; also see Haager et al., 2007; Honig et al., 2000).

Researchers believe there is an optimal window of time in which a child will learn to read. A first-grade student is expected to be reading independently by the end of the school year. When a child does not achieve this goal they experience a loss of motivation, confidence, and self-esteem. According to Juell (1988) a student not reading at grade level by the end of first grade has a 1 in 8 chance of never catching up to grade level expectations. This can result in costly interventions. Struggling students fall further and further behind, eventually become frustrated and often dropping out of schools. Reading materials provided are sometimes too difficult, and struggling readers lose the benefits of gaining language, vocabulary, and background knowledge. This causes students to be less engaged and to suffer from less exposure to the text. The less a student reads in first grade the less they read in subsequent grades. This phenomenon has been a factor that contributes to the gap between proficient readers and struggling readers (Honig et al., 2000).

Juell (1988) confirmed that it is imperative for educators to provide effective teaching in their classroom reading programs that is based on research. This study also found that when intervention was initiated in kindergarten and focused on phonemic awareness and phonological recoding, it provided the skills for children to become successful readers in first grade and beyond. A more recent longitudinal study by Simmons et al. (2008) aimed to corroborate the hypothesis of Juell's study. It consisted of 41 at-risk kindergarten students from the Pacific Northwest who were assessed in the fall of each academic year using DIBELS skills assessment. DIBELS measures phonemic awareness in

kindergarten. Researchers followed the cohort of students through third grade. Students chosen for the study had received core instruction and fell below the 30th percentile on national norms for letter-naming fluency. They also scored in the bottom quartile for their cohort on initial sound fluency. This group of students received small-group interventions under a multi-tiered model over a 4-year period. They were reassessed each year to determine their performance level. Although some gains were statistically significant and others were not, the overall findings report that performance levels for reading increased exceeding the 50th percentile on a majority of the measures and changed the student's at-risk status. In fact, the probability that these students would no longer be identified in the at-risk range for reading was 95% (Simmons et al., 2008). Effective classroom teaching of reading based on research and small-group interventions improved reading outcomes in this study.

Teaching reading is complex. Effective and efficient reading requires a student to have automatic word recognition. This depends on rapid decoding, which is dependent upon phonics and word attack skills. Included in this are print concepts, recognizing the alphabet, and phonemic awareness. When students apply these foundations of reading with lots of practice they can "sound out" words in text and become proficient readers. These components of teaching reading are critical to students in their core instruction (Honig et al., 2000).

Reading Interventions

Education researchers propose that when interventions are needed the interventions can have a lasting effect to improve the performance of struggling

readers. However, interventions must be examined for effectiveness (Chambers et al., 2011). Finding the right intervention can help reduce the gap between struggling and proficient readers (Chard & Linan-Thompson, 2008). According to Murray et al. (2012), researchers agree that more targeted assessment and intervention would be beneficial in helping students improve reading. The National Center for Education Evaluation and Regional Assistance (NCEERA) has recommended that educators screen all students for potential reading problems every year at the beginning of the year and again at in the middle of the year during primary instruction. Only those students who fail to benefit from the high-quality, scientifically based instruction in the regular core classroom would be targeted for more intensive instruction (Gerston et al., 2008; NCEE, 2009; Wanzek & Cavanaugh, 2010).

Interventions Prior to Response to Intervention

For the past 40 years there has been an intense effort to comprehend reading difficulties and accelerate reading outcomes for students with learning disabilities and students at risk (Richards et al., 2007). A multitude of interventions with varying results have produced little movement in closing the achievement gap in reading. Although researchers claim the gap between struggling and proficient readers can be reduced, barriers to success continue to exist (Chard et al., 2008). The barriers that prevent schools from closing the achievement gap in reading have been identified as

- teachers' lack of implementation of research-proven comprehension instruction,

- teachers' failure to model first what they expect their students to do,
- the use of assessments that do not lead toward a better understanding of the students' difficulties in literacy,
- teachers always reading texts aloud and failing to put the responsibility on students,
- teachers replacing comprehension instruction with playing audiobooks or workbooks, and
- teachers giving their entire student body prefabricated notes (Ortlieb et al., 2012, p. 2).

With training for teachers, scientifically based core instruction, frequent monitoring, and providing effective intervention those barriers can be reduced. Harn et al. (2008) assert that explicit, systematic instruction is found to be most beneficial to struggling readers. Reading interventions typically have focused on improving foundational skills, particularly in the area of phonological processing with additional instructional time and small groups' size as key factors.

The most common features of successful interventions that affect student outcomes include (a) intensifying the instructional efforts; (b) lowering the group size; (c) the type of instructional delivery, or the way a lesson is taught; and (d) the amount of instructional time (Harn et al., 2008). Researchers agree on what should be taught, but the frequency and intensity varies in intervention models. In addition, the most intense interventions should be delivered in small-group settings focused on priority skills and instructional support. This targets the needs of the students and provides practice and corrective feedback. Reading

outcomes for students have been improved through interventions when they are based on basic literacy skills such as phonemic awareness, decoding, and word recognition through systematic, explicit step-by-step instruction. This helps students manipulate sounds and letter-sound correspondence (Wanzek, 2010). Although the recommended group size is one to five, schools with challenges in personnel can effectively teach up to eight students in a small group. Larger groups may minimize active engagement and student learning and present minimal improvement. Furthermore, it has been stated, "children do not acquire reading ability naturally, easily, or incidentally; it must be taught (Lyon & Chhabra, 2004, p. 6). The amount of time that a student is engaged in academic learning significantly contributes to their achievement (Harn et al. 2008).

Two particular studies used the common features of successful intervention models to improve reading achievement. The first study, from the University of Oregon and University of Texas at Austin, doubled the instructional time for intensive interventions to compare differences in student outcomes and found positive results. Researchers examined seven schools consisting of 54 first-grade students who were provided two types of intervention. All students were screened for phonological awareness and alphabetic understanding using Phoneme Segmentation Fluency and Nonsense Word Fluency from DIBELS assessments. Students were selected if their performance level was considered deficient and in need of intensive intervention on these measures (Harn, 2008).

The students in Oregon were placed in the most intensive tier with 60 minutes of intensive instruction, while those from Texas were placed in a middle

tier level with only 30 minutes of intervention. Both groups had no more than five students participating. The results found that the students from Oregon, in the more intensive intervention with additional time, outperformed those in the less intensive intervention from Texas. The effect sizes were medium (.022-.109) to large (.138-.500). The findings indicate that lower group size, more time, and intensified instruction benefits struggling readers, helping them to close the gap in their reading skills. Although the findings are encouraging, researchers caution that more rigorous research with larger group sizes is needed to validate the results (Harn et al., 2008).

The second study, using different levels of intervention components, was a longitudinal study conducted by Chard et al. (2008) that followed 668 kindergarten and first-grade students evaluating student progress in a multi-tiered intervention. Both DIBELS assessments and standardized test scores for SAT-10 were used. Boxplots for oral reading fluency measures to examine growth were followed from spring 2004 to spring 2006. In addition, vocabulary and comprehension measures on the SAT-10 were examined. Researchers aimed to predict third-grade performance on high-stakes testing, such as SAT-10 and oral reading fluency. The growth model indicated that oral reading fluency growth is not just linear but also curvilinear. The gains are larger from first to second grades than from second to third grades. This finding is meaningful as there is some tendency for students to decline in words per minute after second grade. Researchers noted the shift from learning to read to reading to learn at the end of the second grade and beginning of the third grade as another reason for

the larger gains in first grade. It was found that oral reading fluency and comprehension passage on DIBELS measures had strong positive effects on SAT-10 measure for comprehension. The most significant impact on students for passage of SAT-10 at the end of third grade was passing the comprehension in spring of first grade on the DIBELS measure (Chard et al., 2008). Other longitudinal studies following kindergarten and first-grade students have produced similar results. By using intensive interventions in kindergarten or first grade, researchers found these early interventions using effective components benefited struggling readers and prevented long-term reading difficulties (Vellutino, Scanlon, Small, & Fanuele, 2006).

Response to Intervention (RtI)

In 2004, the reauthorization of Individuals with Disabilities Education Act (IDEA) set the stage for RtI by authorizing it as a way of identifying students with learning disabilities. This allowed school districts to use a portion of special education funding to coordinate early intervention services for children who were not yet identified as needing special education but who needed additional support to succeed in reading. RtI is seen as an alternative to the intelligence achievement discrepancy model and a way to address the disproportionate number of ethnic minorities identified for special education. The most important driving force behind RtI is prevention (Grigorenko, 2008). RtI is a multistep or tiered-level approach to providing early and progressively more intense intervention within the general education setting. The purpose is to improve student achievement while monitoring frequently, which results in a more

accurate identification of children who demonstrate initial signs of learning disabilities (Fuchs et al., 2011; Grigorenko, 2008; Jenkins, Schiller, Balckorby, Thayer & Tilly, 2013; Knutson et al., 2004;).

Although RtI models can be used for interventions in behavior and math, most RtI models involve instruction and intervention in reading because most students identified as learning disabled have specific reading disabilities. RtI commonly uses a three-tiered model that targets specific reading skills for struggling readers. The first tier is generally the core classroom instruction, the second tier is targeted, systematic instruction for small groups, and the third tier is a more intensive instruction for a longer period of time. The development and implementation of an RtI model requires involvement of all school leaders, including district office and principals. General education teachers and specialists must be trained in reading acquisition and instructional strategies for the essential components of reading. They must also possess knowledge and skills for implementing assessments, especially screening, formative assessment, and progress monitoring (Kerins et al., 2010; McCombes-Tolis & Spear-Swerling, 2011; Richards et al., 2007).

RtI emphasizes the use of small-group remedial interventions for children who have difficulty reading (Chambers et al., 2011). According to the report from NCEERA, RtI has become a potential vehicle to prevent struggling readers from failure. The foundations for RtI frameworks align with essential components of the Reading First Initiative found in NCLB: scientifically based research, explicit instructional strategies, and consistent organizational and instructional routines

(Grigorenko, 2008; Hughes & Dexter, 2011). Multi-tiered models, such as RtI, do not wait for students to demonstrate significant problems before providing intervention as traditional special education identification models had in the past (Chard & Linan-Thompson, 2008).

RtI is concerned with underachievement and provides a fundamental concept of personalized assessments and intervention. The RtI model assumes that children who have weaker responses to scientifically based core instruction in the general education classroom will have difficulties acquiring academic skills. RtI is concerned with schooling, academic instruction, and skills. There are no assumptions about the level of the child's abilities; it is more about their academic performance. Children who are developmentally ready and of a certain age are expected to learn with proper teaching. In addition, RtI distinguishes between poor teaching and low achievement due to a student's individual profile. The teaching is assumed to be effective if the majority of other children in the class are learning at the expected rate and level. RtI also provides a clear understanding that average progress on any specific skill develops at a certain age and grade level resisting comparisons to the norm (Grigorenko, 2008).

Multilevel Three-tiered Models

A fully developed RtI model integrates general and special education while identifying and integrating school resources. This provides effective instruction and intervention for all students (Kerins et al., 2010; Wanzek, 2010). The RtI models are generally referred to as tiers. RtI models typically have three tiers, and the first tier encompasses the general classroom or core instruction.

Students are assessed at least three times per year, and core reading instruction is implemented based on scientific reading research. Student data is used to plan instruction and there is ongoing professional development for teachers (Kerins et al, 2010; McCombes-Tolis & Spear-Swerling, 2011; National Center for Education Evaluation and Regional Assistance [NCEERA], 2009; Wanzek, 2010). The most commonly used RtI model is represented below:

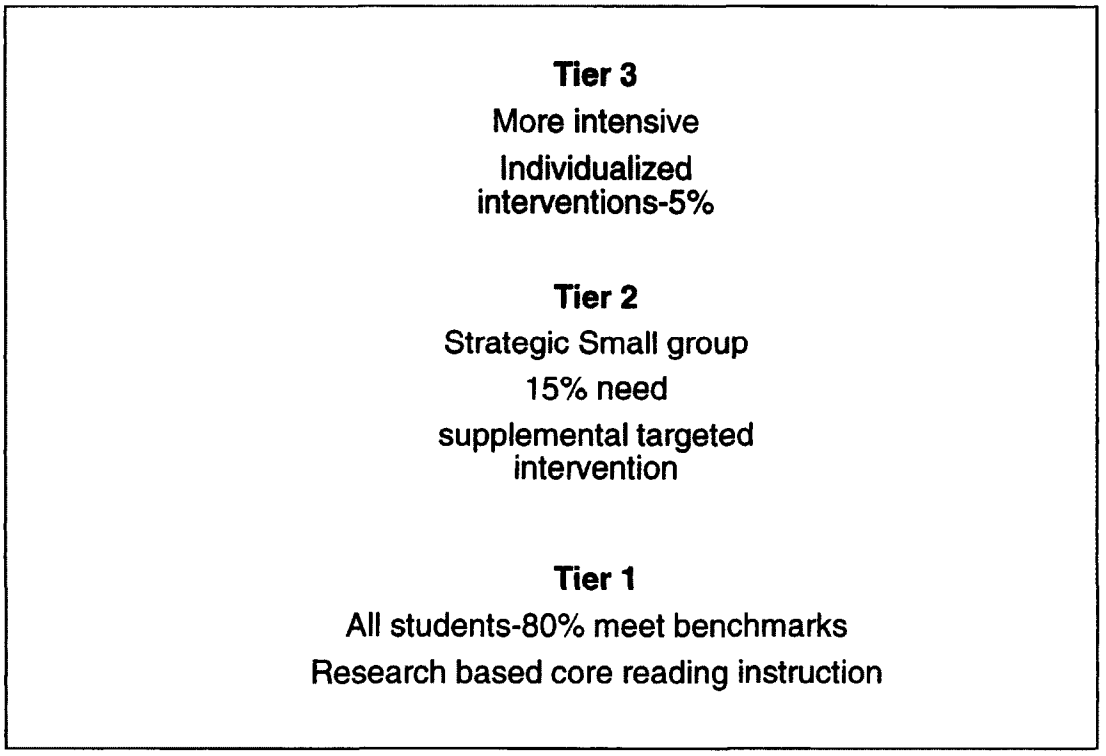

Figure 1. A Three-Tiered Model of RtI

The goal of Tier 1 is to provide high-quality instruction for all students in the regular classroom. Multiple tiers of instruction, beginning with Tier 1, are provided through general education prior to any referral to special education. This scientifically based first instruction consists of a balanced, explicit, and systematic reading instruction where teachers use code-based and text-based

strategies for reading and comprehension. Tier 1 must contain a dedicated, significant amount of time to provide uninterrupted reading instruction with high-quality trained teachers. This dedicated time for reading can include both whole group and small-group instruction. Most children, or approximately 80%, are able to learn to read in this tier of instruction (Abbott & Wills, 2012; Haager et al., 2007; Kerins et al., 2010; McCombes-Tolis & Spear-Swerling, 2011; NCEERA, 2009; Wanzek, 2010).

Tier 2 is a smaller, group-intensive supplemental intervention. Students who demonstrate difficulties despite the instructional efforts in Tier 1 are candidates for additional interventions. This intervention is called the strategic level in most RtI models and includes the most common components of successful reading interventions, such as small groups, more frequent progress monitoring, and intensified instruction on key components of reading. It is designed to accelerate reading progress, and it is believed that participation in this tier can help struggling readers catch up with their peers. Tier 2 intervention includes typically six to 10 students and is conducted for 20-30 minutes every day in addition to the core reading block. It is characterized by frequent monitoring on a weekly or every other week schedule. Researchers vary on the amount of children who require Tier 2 interventions, with numbers being anywhere from 10-20% (Haager et al., 2007; Kerins et al., 2010; McCombes-Tolis & Spear-Swerling, 2011; NCEERA, 2009; Wanzek, 2010)

There are a small, intensive set of students who require replacement curriculum or a mix of interventions in Tier 3. Students who continue to

demonstrate difficulty after receiving instruction in Tier 2 are provided with a third tier with even more time and fewer students, sometimes one-on-one tutoring or two to five students. Tier 3 is designed to be more intensive by adding additional time, and providing smaller groups and more specialized instruction. If a student does not make progress in this tier, it is recommended that the student be evaluated for special education (Haager et al., 2007; Kerins et al., 2010; McCombes-Tolis & Spear-Swerling, 2011; NCEERA, 2009; Wanzek, 2010).

RtI frameworks have become prevalent in school today, as every school is aiming to provide high-quality instruction and access to interventions for struggling readers. It is critical that those who have difficulty with reading early on are identified, supported, and provided with effective and targeted interventions to meet their individual needs. The idea that interventions are progressively more intense with a three-tiered RtI model provides opportunities to serve students who most need additional time, frequency, and duration in their learning. Small group sizes, immediate feedback, different scope and sequence for mastering content, more time for individual response, special focus on needed areas, and the specialization of the instructors contribute to the success of the tiered-intervention model. Collaboration among educators providing reading instruction in different tiers has also been recognized as an asset allowing educators to use objective data and make research-based decisions that drive instruction and improve student performance in reading (Mellar, McKnight, & Jordan, 2010; NCEERA, 2009).

The Components of RtI

The major components of an RtI model include (a) scientifically based core curriculum, (b) universal screening, (c) progress monitoring, and (d) decisions about adequate progress in other tiers. The number one reason for inadequate progress in reading is ineffective instruction. Many students placed in special education do not have disabilities but suffer from poor instruction causing deficits in reading. It is imperative that the core classroom teaching, or core instruction, is scientifically based and grounded in the core components of reading suggested by the National Reading Panel and Reading First (Hughes & Dexter, 2011). In 2009, NCEERA has provided a checklist for RtI models with five recommendations:

Recommendation 1. Screen all students for potential reading problems at the beginning of the year and again in the middle of the year. Regularly monitor the progress of students who are at an elevated risk for developing reading disabilities.

Recommendation 2. Provide differentiated reading instruction for all students based on assessments of students' current reading levels assessed (Tier 1).

Recommendation 3. Provide intensive, systematic instruction on up to three foundational reading skills in small groups to students who score below the benchmark on universal screening. Typically, these groups meet between three and five times a week for 20-40 minutes (Tier 2).

Recommendation 4. Monitor the progress of Tier 2 students at least once a month. Use these data to determine whether students still require interventions. For those still making insufficient progress, school-wide teams should design a Tier 3 intervention plan.

Recommendation 5. Provide intensive instruction daily that promotes the development of various components of reading proficiency to students who show minimal progress after reasonable time in Tier 2 small group instruction (Tier 3).

These recommendations support the RtI purpose of being an early detection and prevention strategy to identify struggling students and identify them before they fail (NCEERA, 2009).

Studies Related to RtI

In this section, the literature that specifically examines RtI design, implementation, and results with struggling readers will be addressed. Since RtI is a method designed to evaluate and address the needs of all students, helping to assess what their reading needs are to be successful and proficient in reading, the research demonstrating the findings of RtI is important. The important question on the minds of educators is whether RtI is the model that will accomplish the goal of closing the gap in reading that exists in our public schools today between those who are proficient readers and those who struggle.

Positive RtI Studies in the Literature

Overall, the research literature reflects positive findings regarding the effect RtI interventions have on improving reading scores for primary students.

Reading interventions have focused on improving foundational skills, particularly in the area of phonological processing, with additional instructional time and smaller group size as key factors (Harn et al., 2008). Providing systematic, explicit instruction with a group of fewer than 10 students is beneficial in helping them to achieve mastery of the core reading skills (Haager et al., 2007). In a case study following second-grade students, Bianco (2010) found that four students not making progress in reading decoding and fluency benefited from extra and more intense instruction. Other mechanisms were also introduced to support teachers in the interventions, including student intervention tracking forms, reading coaches, video clips of high quality teaching, and websites (Bianco, 2010). In this study the findings supported additional time and instruction with high-quality teaching.

Hughes and Dexter (2011), in a meta-analysis study, reviewed 13 field studies where a multi-tiered model of RtI was used. Each of the studies included a defined Tier 1 where there was a high-quality core instructional reading program. Individual components for the RtI models showed positive results for components of the program, although the results were mixed for the program as a whole. All of the field studies that were reviewed were published in peer-reviewed journals or edited textbooks, had at least two tiers of instruction in their RtI model, and provided quantifiable measures of student academic or behavioral outcomes. Out of the 13 studies, nine measured variables related to academic achievement, four measured reading outcomes and three measured math. One study focused on overall academic performance while another focused on other

related behaviors. Six of the studies were related to special education referrals. The general outcome of the review reported three findings: all studies examining the impact of RtI on academic achievement showed improvement, the outcomes were mostly in early reading and math, and overall rates for special education referrals remained constant with just slight decreases. These positive results suggest that students who received high-quality core instruction in the general classroom along with multi-tiered interventions were effective in improving their reading scores (Hughes & Dexter, 2011).

The wait-to-fail model of the past required that students demonstrate significant problems before receiving any intervention (Chard & Linan-Thompson, 2008). In a study using an RtI model led by Fuchs in 2008, a randomized control trial was implemented in first-grade classrooms to compare an intervention group with a group receiving no treatment. The goal was to measure the effectiveness of the intervention. Forty low-performing readers were identified, with 16 receiving regular instruction in the general education classroom without access to additional interventions and 24 receiving interventions. Students in the intervention group worked for 45 minutes four times a week for about 9 weeks. The children in the intervention group demonstrated greater growth on the word identification fluency measure than those not participating in the intervention. They also received higher scores on word attack, decoding, and sight-word fluency (Fuchs, Compton, Fuchs, Bryant, & Davis, 2008). This study corroborates the benefits of a tiered model of intervention such as RtI utilizing smaller groups and more time and targeting specific reading goals.

Another study by Case and colleagues (2010) validated similar positive results for first graders participating in short-term reading interventions under an RtI model. Students were from three suburban non-Title I schools in the mid-Atlantic region from nine specific classes. It was an experimental study where students were randomly assigned to a control group; an experimental group with students in the intervention group received 16 hours of intervention. Progress monitoring was done in the following areas: letter-sound fluency, word identification fluency, decodable word fluency, spelling, and math calculation fluency. The results of the study produced medium to large effect sizes, suggesting that the intervention group outperformed the control group. The findings were considered significant for decodable word fluency in particular, but not all measures produced significant results. The authors propose cautious optimism and are hesitant to propose that the success of the interventions could be transferred (Case et al., 2010). However, their results demonstrate the benefits of using the components of a successful intervention programs, such as more time, targeted instruction and smaller group size.

Similarly, an experimental design following kindergarten students to second grade found positive results for students participating in direct multi-tiered interventions. Nonsense-word fluency and oral reading fluency from DIBELS, as well as the Woodcock Reading Mastery Test-Revised, a norm-referenced reading assessment, were the measures used in this study. The findings indicated significant gains for the participants while important differences were found in the types of curriculum used with tertiary level students. The most

beneficial curricula for growth in phonemic awareness and decoding skills were Direct Instruction and Open Court. Supporting research found using highly structured explicit instruction for students at risk improved reading (Kamps et al., 2008).

Other first- and second-grade students demonstrated progress in a multi-tiered model of intervention using computer-assisted tutoring to improve their reading outcomes. Thirty-three high poverty Success for All (SFA) schools in nine states participated in this study where struggling readers participated in a Tier 2 intervention using a computer model called Team Alphie. First-grade students in the treatment group significantly outperformed the control group on all three reading measures on a standardized reading test. No significant differences for second graders were found. Researchers claim this is notable because computer-assisted programs could be used in other settings as an intervention to improve readings skills (Chambers et al., 2011). All of these studies used an RtI model that increased time for interventions, decreased the size of the group of students instructed, and provided targeted instruction based on the most effective components of reading.

Mixed RtI Studies

The results of studies of RtI intervention and its impact on student performance are mixed. Tran, Sanchez, Arellano, and Swanson (2011) performed a meta-analysis study of the literature to compare responders to nonresponders for reading interventions. A search was done for frequently cited authors on RtI and interventions, and 160 articles were found dating from 1975 to

2009. Thirteen of these studies were coded and analyzed. The study followed findings from Al Otaiba and Fuchs in 2002 where it was determined that a key characteristic of children who were nonresponders was lack of phonological awareness. In fact, 70% of the studies in their syntheses demonstrated that phonological awareness was the critical component. A pretest and posttest were used to identify children who were responders and nonresponders. Two questions were asked in this meta-analysis: (a) what characteristics were evident for responders and nonresponders and (b) what variables can be identified that affect posttest outcomes? After determining correlations, effect sizes, and hierarchical linear modeling, support for the two assumptions in this study was weak. Performance on a pretest for phonological awareness did not better predict the posttest performance, and there was no increase in magnitude of effect sizes, and no reduction, between responders and nonresponders on the posttest (Tran et al., 2011). Using reading interventions without all the components to provide targeted intervention did not demonstrate there was a significant difference in responders and nonresponders in this synthesis.

Using assessments to identify struggling readers who need RtI interventions, monitor student progress, and inform instruction is part of the RtI structure. The use of formative assessments is well documented and has been defined as including (a) regular assessment of student performance, (b) data-based problem solving and feedback for modifying instruction, and (c) individualized instruction for the needs of each student (Knutson et al., 2004). According to Reeves, "assessments must be used as a source of information for

both students and teachers" and "tests what we teach" (2007, p. 3). Even with standards being linked to assessments as a measure for student performance, it is imperative that teachers use the right formative classroom assessments that serve the purpose for monitoring progress to improve student performance (Reeves, 2005). Studies have linked dynamic testing assessments to RtI with positive results as a measure of formative assessments (Fuchs et al., 2011; Grigorenko, 2008).

In a qualitative case study using two 9-year-old second-grade students, researchers found that using formative assessments, reducing the group size, and implementing mastery learning criteria produced positive reading outcomes for oral reading fluency. By regularly assessing the student's performance, decisions about progress and instruction could be made to meet the needs of the student. DIBELS assessments using skill tests for initial sound fluency, segmentation, and letter-naming fluency at the beginning of the study were used and progressed to using oral reading fluency as the formative assessment measure for progress. After weekly progress monitoring and grade-level instructional material with interventions, both students made substantial progress. Michael, the first case study participant, scored 95% accuracy on oral reading fluency, while Alexandra, participant two, scored 90% accuracy. The results of this study reinforce that students can make adequate progress in reading when monitored using effective assessments and data-driven decisions about instruction (Knutson et al., 2004). Using effective screening measures as

outlined in the practice guide from What Works Clearinghouse is critical to providing effective interventions (Wanzek & Cavanaugh, 2010).

Assessments in the past were difficult, unreliable, and burdensome in structure. The most common assessment used in determining early phonemic awareness skills and RtI intervention progress is the DIBELS battery of tests and initial sound fluency. In a quantitative study where preschool and kindergarten children were assessed for phonemic awareness, researchers claimed that the direction for assessments should remain in those measures that are efficient and reliable and can result in valid decisions making. After 17 schools from three states in the Midwest, Rocky Mountain West, and Pacific Northwest participated in the study, it was determined that first-sound fluency measures are most effective and reliable in predicting reading improvement when assessing phonemic awareness. Better student outcomes can be realized if this measure is used as an indicator for reading success (Cummings et al., 2011).

However, Lipson et al. (2011) warn against a one-size-fits-all model for RtI. In their article, they claim RtI focuses too much on assessment and uses assessment for multiple purposes, such as screening, diagnostics, formative progress monitoring, benchmark progress monitoring, and summative outcome assessments. Claiming that the underlying reasons for reading difficulties are diverse, they suggest that focusing on the right instruction is more important and educators should gather as much information as possible to make good instructional decisions. Without good diagnostic information student performance cannot improve. Lipson champions "adopting systems that permit the effective

use of the information for instructional decision-making (2011, p. 3). Other research validates the use of DIBELS measures as a way to effectively measure expected student growth, allowing educators to make decisions about instruction and provide positive results for student outcomes (Hagans, 2008).

Increased time, smaller group size, and effective assessments are all evident in the research as being key factors of RtI that improve reading outcomes. Several other supporting factors appear to be necessary in an effective RtI program. As RtI emerges in its development, extensive ongoing professional development is needed to ensure fidelity. Administrators must demonstrate their support and become knowledgeable about the process, implementation, and monitoring of RtI. Establishing the need for RtI is critical for teacher buy-in and for the implementation of the intervention. If educators are to make data-driven decisions using assessments from progress monitoring, more time for dialogue and coordination is needed to adequately make instructional decisions (Hughes & Dexter, 2011). Time, encouragement, and motivation also play a role in student success in interventions. In a case study of two students, Devan and Nina, Devan made progress in reading fluency only after receiving targeted assessment, instruction, and individualized attention. Targeted assessment along with attention to the individual skills made the difference (Murray et al., 2011).

The goal of RtI is to help educators be responsive to the needs of students by providing first instruction that is balanced and high quality along with effective interventions. Implementing RtI effectively is of great importance and helps to

provide success to student in reading. Using scientifically based interventions and instruction and assessments and making high-stakes decisions that are based on the needs of the students provide a map toward more successful student outcomes (Burns et al., 2010). The multi-tiered model of RtI is one of prevention and early intervention that seeks to minimize failure for students at risk for reading, and in some respects it is synonymous with differentiated instruction (Kerins et al., 2010). As RtI is relatively new as an intervention model, studies are continuing to be conducted in regard to its efficacy. Research is varied thus far, with some results positive and statistically significant while others show no differences between treatment groups and control groups. Continued longitudinal research is needed.

Summary and Implications

Overall, the research literature on RtI is positive with some mixed results and caution. Several studies of RtI being used in early grades, such as kindergarten and first grade, show statistically significant results increasing effect sizes overall and increasing reading skills. Bianco (2010) reported that all students in her study benefited from the extra and more intense instruction provided during intervention. In addition, all studies examining the impact of RtI on academic achievement in a meta-analysis showed improvement (Hughes & Dexter, 2011). A study by Fuchs (2008) on 40 low-performing students indicated that the low-performing students participating in the intervention showed greater growth than those who did not participate. Most significantly, their scores for word attack, decoding, and sight word recognition improved. As RtI becomes

more prevalent, these studies, along with future research, will help guide educators to make informed decisions about the level of intervention, instructional diagram and quality, and groupings and time expectations for increased student success in reading. With effective intervention programs in place school districts can finally move toward closing the achievement gap.

CHAPTER 3

METHODOLOGY

Chapter 3 has three parts: the context, research design, and the chapter summary. The first part of the chapter begins with the context, which describes the district and communities that are the target of this research. Next, the research design using one group pretest-posttest with descriptive and inferential statistics is explained. Several research questions are posed. A general description of the population from which the data is collected will follow, including the assurance of ethical protection of the participants. The next part of the chapter will explain the instrumentation and data collection including a details of descriptive analysis, comparisons, multiple regression, and other data measures used in this study. The chapter concludes with a data analysis, limitations of the study, and a summary of the research.

Context

This study took place in a suburban Southern California school district. It is a large K-12 school district in the northeast section of Orange County, California. The district primarily serves two similar, large cities, as well as portions of three smaller cities and a developing territory that reaches to the Riverside County line. Of the 34 school sites in the district, there are 21 elementary schools, five middle schools, a K-8 school, four comprehensive high schools, one special education school, one continuation high school, a K-12

home school, and a 9-12 independent study high school. Total student enrollment in 2011-2012 was 25,747. It is a diverse district with the following ethnicities in 2011-2012: 44% White non-Hispanic, 38% Hispanic or Latino, 12% Asian not Hispanic, and 6% other ethnicities, including American Indian, Filipino, Pacific Islander, and African American.

Considered to be a high-performing school district with an API of 867 during the 2011-2012 school year, students in the district excel on standardized tests, outperforming other students in the county and the state each year. There are 23 California Distinguished Schools, five National Blue Ribbon Schools, one California Model Continuation High School, one California Exemplary Independent Study School, and one accredited K-12 home school in the district. Ninety-five percent of the graduates pursue post-secondary degrees, and the district reports 30 National and Commended Merit Scholars each year. Graduates are known to attend prestigious colleges and universities and have included appointments to the Air Force Academy, Annapolis, and West Point. Graduates from the district include a world-renowned opera singer, a nationally recognized physician, and gold medal winners in the Olympic Games.

In addition, staff members are frequently recognized for their expertise and contributions to education. Numerous county, state, and national awards have been presented to staff, including Teacher of the Year, Continuation High School Teacher of the Year, National Health Educator of the Year finalist, the nation's outstanding Director of Activities, New Drama Teacher of the Year, the nation's finalist for Technology Director of the Year, and Superintendent of the

Year. Over 78% of certificated staff members have earned advanced degrees. There is a strong connection between staff and the community, with more than 400 current employees having graduated from the district.

Two primary cities in the community are served by this school district. Both have upper middle income to middle income residents with some ethnic and socioeconomic diversity. The largest city reports a total population of 58,918 with a median income of $96,132, of which 19.4% report in excess of $150,000 annual income. There is a 69.3 % employment rate with 28.4% reported to be not in the workforce, mainly retirees and children. Over 49% hold management or professional positions in their occupation. Households are composed of 89.7% non-Hispanic with 10.3% of families of Hispanic heritage. Over 80% of families in this city report they speak English at home. In 1999, the city showed a 2.5% poverty status on the U. S. Bureau of the Census report. Eighty-five percent of households are owner occupied while only 15% are renter occupied. It is a newer community, with more than 83% of the homes built after 1970 and half of homes built during the 1980's.

In the second city served by the district there was a total population of 51,302 in 2011-2012 composed of 44.7% non-Hispanic White, 36.4% Hispanic, 14.9% Asian & Pacific Islander, 1.8% Black, and 2.4% all other races. It was incorporated in 1926 and encompasses 6.6 square miles. Residents report 85.5% are high school graduates with 36.3% holding a bachelor's degree or higher. There is a 66.9% homeownership rate with a median home value of $576,400. Median family household income was $76,678 in 2010 with 10.9% of

persons reported below the poverty level. Additionally, 36% of the population reported speaking a language other than English at home. This city has 28,021 registered voters with 8,567 claiming Democratic affiliation, 13,081 registered as Republicans, and 5,316 who decline to state their political party affiliation.

Research Design

Gathering objective data and expressing the data in numbers is the basis of quantitative research. Quantitative methods of evaluation allow a researcher to draw conclusions about the effectiveness of a program. Such methods are frequently used to draw conclusions about a target population (Haller & Kleine, 2001). According to Haller and Kleine (2001), quantitative research comprises three research designs: descriptive, relational, and experimental (also known as descriptive, associative, and differential). Experimental designs are considered the best for evaluating outcomes and the impact of a program or intervention and involve evaluating the participants who have been randomly assigned to one or two or more groups. One group receives the intervention while the other does not. This is also referred to as randomized controlled trials (Bickman & Rog, 2009). Such experimental studies in education are questionable, making quasiexperimental designs preferred. This study used a quasiexperimental design.

Quasiexperimental design allows the researcher to examine the effects of an intervention by comparing the results of two groups, but it lacks the key factor of experimental design: randomization (Bickman & Rog, 2009; Haller & Kleine, 2001). This approach is used to reduce the effect of outside events on the

assessment of a program's effectiveness when experimental design is not practical. When using quasi experimental design, the researcher must be cautious and takes steps to ensure that the intervention group is similar to the comparison group. While experimental design minimizes the effects of outside influenced, quasi experimental design reduces them (Bickman & Rog, 2009; Haller & Kleine, 2001).

This research uses a one-group, pretest-posttest design to analyze descriptive statistics, associations, and differences. By conducting a statistical analysis using a one-group pretest-posttest design, I aimed to explore the relationship between RtI reading intervention and reading outcomes. For this study, the intent was to describe data, demonstrate how two variables are related, and compare scores for benchmark periods and of subgroups in the study. An analysis of descriptive statistics, a dependent paired sample *t*-test to measure differences, and a multiple regression were used to show the differential effects of three data periods and independent variables (Bickman & Rog, 2009).

Research Questions and Hypotheses

Studies that use inferential statistics must have hypotheses that are closely related to research questions.

The research questions this study investigated are:

1. What are the changes in reading outcomes for students who participated in a year-long Tier 2 RtI reading intervention?

Hypothesis: Participation in RtI intervention improves reading outcomes for Tier 2 students as measured by DIBELS Next reading assessments.

2. Are there differences in outcomes for students who participated in a year-long Tier 2 RtI reading intervention for the three benchmarks?

   Hypothesis: Participation in RtI intervention improves reading outcomes incrementally during each benchmark for Tier 2 students.

3. After controlling for student demographics (gender, English learner status, and free and reduced-price lunch status), what is the effect of RtI on reading outcomes for those students in Tier 2 reading intervention?

   Hypothesis: Reading achievement for students participating in Tier 2 RtI interventions improves regardless of gender, free and reduced-price lunch status or English learner status.

Population

For the purpose of this study, I examined assessment data provided by the district for a cohort of 1,850 third-grade students from all 21 elementary schools during the year 2012-2013. This included data from all schools: Title I and non-Title I. Students in third grade are typically 8 to 9 years of age and are developmentally ready for internalizing the reading process. All elementary schools in the district participated in the RtI intervention model during the past several years. All third-grade students in this sample were enrolled for the first day of school and participated in the DIBELS Next reading assessments in September of 2012 for benchmark one. Students considered advanced and

proficient in reading as, measured by the California State Standards Tests in language arts for the year 2011-2012 while in second grade were not assessed.

Three of the elementary schools are considered large schools with student, populations over 700, while the rest of the schools serve 400-600 students. Seven of the elementary schools in the district serve K-5 students, one is a K-8, and the remaining 12 schools serve K-6 students. Six of the 21 elementary schools receive Title I federal funding for socioeconomic hardship. With a maximum state limit of 32 students per classroom for third grade, classes ranged from two third-grade classes per school to five third-grade classes per school, depending upon the enrollment at each specific school site.

Third grade students are pertinent to this study and were chosen for a number of reasons. With the inception of NCLB in 2002, the federal government set goals for establishing reading programs for students in kindergarten through third grade that are based on scientific reading research and ensure that students read at or above grade level by the third grade (NCLB, 2002). However, results from standardized tests indicate that the gap has not closed and there is a continued need to address reading proficiency. In 2010, the National Assessment of Educational Progress reported that two thirds of fourth-grade students across the nation do not read at grade level and have difficulty catching up with their peers (Cummings et al., 2011). In addition, the literacy skills that students acquire by fifth grade lay a critical foundation for success in higher education and career readiness so it is imperative that by the end of third grade students are well on their way in their reading abilities.

These skills become a partial predictor in how successful students become in the later years in preparation for the employment industry, especially in math and science fields. In the most recent report on the conditions of children in Orange County, fifth-grade students in California scored a mean scale score of 366 in language arts during the 2011-2012 school year. The percent of students achieving proficient and advanced levels in English Language Arts was 69%, with only 32% of English learners scoring in those ranges (Report on the Conditions of Children in Orange County, 2012). The belief of district leaders is that third grade is a pivotal year in a student's elementary education where students are shifting from "learning to read" in the primary grades to "reading to learn" in the upper grades. This philosophy was another primary reason for choosing the third-grade level to examine reading scores to determine if the RtI intervention model has had any impact on improving reading outcomes.

Instrumentation and Data Collection

This study examined individual reading scores from the district multiple measures reading assessment, DIBELS Next. This assessment consists of three benchmark periods and includes an overall DIBELS composite score (DCS), along with individual scores for fluency, retell comprehension, retell quality, and a comprehension measure called the DAZE, which uses a reading passage with blank spaces which students must fill in depending on their knowledge of context clues in the passage. This is done on the computer. DIBELS Next is considered an adequate measure of reading progress representing the probability of meeting reading outcomes based on educational research. This reading assessment was

developed in the early 1990s through research that builds on measurement procedures from curriculum-based management and general outcome measurement. The measures used in DIBELS assessments include (a) phonemic awareness, (b) phonics, (c) fluent reading of connected text, (d) vocabulary and language skills, and (e) comprehension. They are designed to be efficient and economical measures to indicate a student's progress toward reading. Research after widespread use of DIBELS has documented the reliability and validity of the measure. The research of DIBELS has been expansive and resulted in the DIBELS Next version in 2010 (Hall, 2006).

In using this measure, the best overall estimate of a student's early literacy skills and reading proficiency is the DCS, which is a combination of the multiple skills measuring overall performance in reading. This overall score provides benchmark goals and cut points for risk three times per year. It indicates a student's overall level and likelihood of achieving reading goals. The three levels of instruction are: *at or above benchmark, below benchmark,* or *well below benchmark.* A student who scores *at or above benchmark* is 80%-90% likely to achieve early literacy goals while only 40%-60% of those students in the *below benchmark* range are likely to achieve those goals without needing intensive support. Furthermore, students who score in the *well below benchmark* range are 10%-20% likely to meet reading outcomes without intensive intervention (DIBELS Next Training Manual, 2010). The third-grade measures included in the DCS are fluency and comprehension. The DCS is a determining factor for which reading instruction a student will receive for the school year.

DIBELS Next assessments were administered to third-grade students examined in this study three times during the 2012-2013 school year beginning in September of 2012. Each time the data was recorded through the use of a computer to assess the students, and the DCSs were generated by the computer data management system. A final report of student scores was available immediately after the assessments, with individual measures and scores for every child assessed. The DCS indicated the student's score level using defined cut points for determining who would be at-risk students and which reading instruction they would receive.

Once these scores were available, the grade-level team of teachers reviewed the data and organized students into groups based on their score, determining the instructional program or intervention that each child would receive for reading instruction. Additional members of the team decision included the administrators, special education staff, and the psychologist in some instances. The RtI model used by the district recommends all students *at the benchmark level* participate in Tier 1, students *below benchmark* participate in Tier 2, and students scoring *well below benchmark* participate in Tier 3. Students were enrolled in their RtI reading group as their score indicated and instructed at that level for reading for a period of 30-45 minutes per day in addition to their regular language arts block. The baseline benchmark is administered in September, with benchmark two and three occurring in January and May respectively. Below is a table indicating the third grade benchmark goals and cut points for risk as defined by Dynamic Measurement Group, Inc.

Third Grade Benchmark Goals and Cut Points for Risk

Measure	Score Level	Likely Need for Support	Beginning of Year	Middle of Year	End of Year
DIBELS	At or Above Benchmark	Likely to Need Core Support	220 +	285 +	330 +
Composite	Below Benchmark	Likely to Need Strategic Support	180 - 219	235 - 284	280 - 329
Score	Well Below Benchmark	Likely to Need Intensive Support	0 - 179	0 - 234	0 - 279
DORF	At or Above Benchmark	Likely to Need Core Support	70 +	86 +	100 +
Words	Below Benchmark	Likely to Need Strategic Support	55 - 69	68 - 85	80 - 99
Correct	Well Below Benchmark	Likely to Need Intensive Support	0 - 54	0 - 67	0 - 79
DORF	At or Above Benchmark	Likely to Need Core Support	95% +	96% +	97% +
Accuracy	Below Benchmark	Likely to Need Strategic Support	89% - 94%	92% - 95%	94% - 96%
	Well Below Benchmark	Likely to Need Intensive Support	0% - 88%	0% - 91%	0% - 93%
Retell	At or Above Benchmark	Likely to Need Core Support	20 +	26 +	30 +
	Below Benchmark	Likely to Need Strategic Support	10 - 19	18 - 25	20 - 29
	Well Below Benchmark	Likely to Need Intensive Support	0 - 9	0 - 17	0 - 19
Retell	At or Above Benchmark	Likely to Need Core Support	2 +	2 +	3 +
Quality of	Below Benchmark	Likely to Need Strategic Support	1	1	2
Response	Well Below Benchmark	Likely to Need Intensive Support			1
Daze	At or Above Benchmark	Likely to Need Core Support	8 +	11 +	19 +
Adjusted	Below Benchmark	Likely to Need Strategic Support	5 - 7	7 - 10	14 - 18
Score	Well Below Benchmark	Likely to Need Intensive Support	0 - 4	0 - 6	0 - 13

The benchmark goal is the number provided in the At or Above Benchmark row. The cut point for risk is the first number provided in the Below Benchmark row.

Figure 2. Third Grade Benchmark Goals and Cut Points for Risk

An approval from the California State University, Fullerton Institutional Review Board (IRB) was obtained to protect the rights of individuals participating in this research (Appendix A). The IRB process assures that the researcher has assessed the potential risks, such as physical, emotional, social, economic, or legal harm to any participant in the study. Confidentiality and security of the research data was procured to protect identities as well (Creswell, 2009; Creswell & Plano Clark, 2007). Other multiple permissions were obtained to

collect the assessment data, including permission from the Superintendent and Assistant Superintendent Educational Services (Appendix B). Collecting secondary quantitative data using instruments that measure individual performance on aptitude or standardized tests has been common over the years. In addition, ethical issues such as handling the data as sensitive information and disclosing the purpose of the research were addressed with personnel in the educational services division who handled the data (Creswell & Plano Clark, 2007).

Data Analysis

Data analysis for this one-group pretest-posttest study was quantitative in nature using nationally normed standardized reading assessment results. The data analysis consisted of two stages. Stage 1 comprised the quantitative analysis of the demographic data using descriptive statistics. Stage 2 involved inferential statistics using a paired sample *t*-test and a multiple regression model. The data from DIBELS Next and other demographics data were entered into an Excel spreadsheet and prepared for the statistical model. It was entered into the Statistical Package for the Social Sciences (SPSS), Version 19.0 for analysis. SPSS is one of the most commonly used computer software packages for data analysis (Field, 2009).

Stage 1. The function of descriptive statistics is to summarize and describe the data. DIBELS Next data was collected and integrated into an Excel spreadsheet assigning numbers for the 21 schools for confidentiality and specific coding for benchmark periods and subgroups. To explore the data, the frequency

and distribution of scores in each benchmark were tabulated. Next, measures of central tendency were taken and organized within a table, indicating minimum, maximum, and mean scores for each benchmark period. Standard deviation was also calculated. These descriptive statistics indicated the details of the sample group and the changes in reading outcomes for students who participated in the Tier 2 reading intervention.

Stage 2. Stage 2 involved using inferential statistics with the same data set. Identification codes and participants scores were included in each file to conduct a paired sample *t*-test to measure differences in the benchmark time periods for the sample. By comparing the two sets of data collected, I sought to determine if those differences are large or small and if they occur by chance or due to the intervention. Statistical significance was also examined for the changes in scores. The dependent sample *t*-test helped determine significant differences in the three benchmark periods. In order to determine if there are any differences in demographics (gender, English learner status, and free and reduced price lunch status), a multiple regression was conducted. Regression techniques examine the relationship between variables as a linear model. This assumes that the relationship is linear and that the error is normally distributed and uncorrelated with the predictor (Bickman & Rog, 2009; Field, 2009). The regression model used the following equation:

$$\text{Outcome Y (reading achievement)} = \beta_0 + \beta_1 \text{ (gender)} + \beta_2 \text{ (free and reduced-price lunch)} + \beta_3 \text{ (English learner status)} + \beta_4 \text{ (RtI participation)} + \varepsilon$$

Validity

In order to ensure the internal validity of such a study the researcher must guard against two factors; history and maturation. History "refers to events occurring outside of a study that might impinge on its outcomes" (Haller & Kleine, 2001, p. 102). Students are surrounded by a multitude of experiences, and these experiences can affect the students' knowledge or tested achievement apart from the intervention. Maturation involves the physiological changes that can occur within participants while involved in the particular study. This can affect the internal validity of the study when students are involved for a long period of time or are going through rapid changes. When a study accounts for the threats to internal validity, it is more likely that the results can be generalized to the general setting (Bickman & Rog, 2009; Field, 2009; Haller & Kleine, 2001).

To control for internal validity in this study, I examined scores from a nationally normed reading assessment that is familiar to students. Students in this sample not only have been accustomed to these reading assessments for several years but they also have a history of participating in the RtI model and groupings that were examined in this study. Since the three-tiered RtI model of reading groups was established in the district in 2008, students who have been enrolled in the school district since 2008 were familiar with the processes and procedures of the assessment, changing classes for reading groups, and using different curricular materials. For the chosen year, 2012-2013, no major changes or shifts in district policies and procedures occurred. This reduces the internal threat to validity in regard to history. Since the study was conducted for a short

period of time, one school year, there is minimal chance of maturation validity threats.

Validity for change is required in this study to determine if the measure shows an observable difference as a response to the signal or intervention effects. Measures that are valid for change will respond when an intervention alters the characteristic of interest and shows a contrast between groups. With studies such as this one, measuring the intervention involves assessing for the internal validity. A one-group pretest-posttest design is relatively simple to implement; however, researchers warn of the design's susceptibility to threats. This refers to whether or not accurate conclusions can be established as to the how the treatment made a difference in the outcome. Internal validity should be a researcher's first concern (Bickman & Rog, 2009).

While threats to internal validity are of concern for a one-group pretest-posttest design, the plausibility of an internal threat also depends on the particular content and context of the study. Threats of history and maturation are not likely in short time frame study as this one. It is important to consider the particular circumstances of the study when choosing a quasiexperimental design. This research took steps to collect data in a secured manner and rule out the validity threats to the one-group pretest-posttest design to which it is susceptible (Bickman & Rog, 2009). In the context of this particular study I have considered all threats to validity and found familiarity of the assessments, consistent policies and procedures for implementation, and frequent monitoring and collection of

data to be factors in making any threats to the validity of this study relatively negligible.

Chapter Summary

This research is a quasiexperimental study using a one-group pretest-posttest design. This study explores the relationship between reading outcomes and RtI participation. Specifically, reading scores for third-grade students who participated in Tier 2 of the RtI model during the year 2012-2013 are examined. DIBELS Next is the reading assessment used as the measure.

In Chapter 4 descriptive data will be examined reporting minimum and maximum scores along with the mean and standard deviation to determine changes in reading outcomes for those students who were grouped in the Tier 2 reading intervention through RtI. In addition, the data from a paired sample *t*-test is reported to compare differences in the designated benchmark periods 1, 2, and 3, and to determine statistical significance or any changes that are evident. Changes in reading outcomes for three demographic independent variables, gender, free and reduced-priced lunch and English learner status, are examined.

CHAPTER 4

FINDINGS

This chapter presents findings of the research study. The chapter begins with an introduction of the research design and the RtI model implemented that is the focus for this study. The results of a data analysis are reported, including demographic report of population, descriptive analysis of the participants, results of the dependent sample *t*-test, as well as the findings of a multiple regression analysis. I used the data collected to examine statistical significance in reading change. This data analysis explores the relationships between the variables, RtI reading intervention and reading outcomes. All findings relevant to the research questions and hypotheses are presented. The chapter concludes with a summary.

Research Design

The one-group pretest-posttest design in this study examines data from one group of participants over a specified time frame, measuring changes between the dependent variable and the independent variable or variables. There were 1,850 students enrolled in the third grade during the 2012-2013 school year in the district chosen for this study. Data was analyzed for only those students who were identified as Tier 2 candidates based on their initial reading assessment using DIBELS Next assessments as the measure. This group of Tier 2 students took an initial DIBELS Next reading assessment at the beginning of

the school year in September 2012. This was administered by a credentialed teacher using a computer to record results. Each student's results for the reading assessment was automatically tabulated through the DIBELS Next assessment program. The assessment materials and procedures used during the evaluation were selected by the district and are not considered to be racially, culturally, or sexually discriminatory. DIBELS Next assessment is considered a valid assessment for the specific purposes of determining a child's reading progress. The first assessment in September of 2012 was considered the first benchmark and the pretest. The final assessment period at the end of the year in May was considered the posttest in this design.

The next benchmark fell at the end of January 2013 and was considered to be a midyear assessment. The final assessment for the year, or the posttest, was administered at the end of May 2013. To determine if the students were identified as Tier 2 students, their overall DCS, consisting of measures for fluency, retell, comprehension, and quality of retell and comprehension, was used. The DCS is considered a valid measure of reading progress taking into account several subtests measuring reading skills. All tests were administered in conformance with the instructions provided by the publishers of the assessments. Teachers who administered the assessments were trained by the publishers to correctly administer the reading assessment or by district trainers who had been trained by the publishers. DIBELS Next is accepted by educational researchers as a valid measure for reading. Each benchmark represents a picture of the actual levels of performance for every child. Testing was completed over several

days as to not tire the student in one sitting and to provide the best possible results. The district provided a 1-month window for assessing all students for each of the three assessment periods.

This study took place in a suburban southern California school district using a three-tiered RtI design for reading interventions. It is the most commonly used model used for RtI and consists of Tier 1 for students are reading at grade level, Tier 2 for students who are slightly below grade level (6 months to 1 year below grade level), and Tier 3 for those students who are significantly behind in their reading skills by 2 or more years. The model was piloted in 2007 by a small group of six elementary schools and fully implemented district wide in all 21 elementary schools at the beginning of the 2008 school year. The purpose of implementing the RtI intervention model was to provide early intervention for those students struggling in reading, creating a structure to remediate reading skills in order to prevent students from being falsely identified for special education. This goal was to meet guidelines for improving reading scores to reflect 100% of students reading in the advanced or proficient ranges by the year 2014 as designated by NCLB and the district goal of ensuring that every child meet their academic potential.

Research Questions

This research investigates the reading outcomes of students participating an RtI model of intervention for reading. The design and data in this study was used to answer the following research questions:

1. What are the changes in reading outcomes for students who participated in a year-long Tier 2 RtI reading intervention?
2. Are there differences in outcomes for students who participated in a year-long Tier 2 RtI reading intervention for the three benchmarks?
3. After controlling for student demographics (gender, English learner status, and free and reduced-price lunch status), what is the effect of RtI on reading outcomes for those students in Tier 2 reading intervention?

Data Analysis

Descriptive statistics. Descriptive statistics are used to describe and summarize data. By analyzing descriptive data, I was able to make information easier to read, to understand, and to assimilate into the inferential statistics. Types of data measured in descriptive analysis included mean, median, mode, frequency and distribution of scores, deviations from the mean, and measures of central tendency and range. The average value of the scores of the distribution (mean), differences between the maximum and minimum scores (range), and the variance of the scores (standard deviation) were the most critical to examine

Population demographics. This study examined assessment data provided by the district for a cohort of 1,850 third-grade elementary students for

the year 2012-2013. Data was collected from all 21 elementary schools including Title I and non-Title I schools. Students in third grade were chosen because they are typically 8 to 9 years of age and are developmentally ready for internalizing the reading process. A district-wide RtI model of intervention for reading was implemented in all elementary schools and every school participated in the RtI model for the preceding 5 years. The RtI model, student groups by Tier levels, materials, and staffing were all familiar to the staff and students. All third-grade students in this sample were enrolled for the first day of school and participated in the DIBELS Next reading assessments in September of 2013. Data for this study was collected for students who were identified as the Tier 2 level students from the results of the September 2013 DIBELS Next reading assessments. The population demographics are described in Table 1.

The data indicates there was a total of 1,850 students enrolled in third grade for the 2012-2013 school year. There were 943 male students and 870 female students in the sample comprising 52% males and 48% females, respectively. Of the 1,850 students enrolled that year, 1,813 students attended the 21 elementary schools and were a part of the population demographics. The remaining 37 students were a part of home education, home hospital, independent study, or private school. Approximately 35% of the students in the population of 1,813 qualified for free or reduced-priced lunch. There were 236 English learners in this population, representing 13% of the third grade.

Table 1

Demographics for Third-Grade Students in 2012-2013

School	Total *N*	Male	Female	EL	FRL	*n* Tier 2 student
1	72	42	30	9	13	9
2	93	44	49	3	5	4
3	73	44	29	0	10	2
4	65	40	25	6	27	5
5	119	65	54	6	14	4
6	104	40	64	0	6	2
7	80	59	21	1	7	6
8	72	34	38	9	22	1
9	97	45	52	54	82	7
10	76	35	41	14	42	8
11	171	81	90	68	128	28
12	76	35	41	3	10	2
13	60	32	28	32	60	9
14	89	31	58	6	18	6
15	82	43	39	28	70	10
16	89	40	46	1	4	5
17	79	49	30	35	67	2
18	60	25	35	0	15	2
19	59	43	16	1	16	5
20	130	75	55	2	3	0
21	97	59	38	1	7	0
Totals	1,813	943	870	236	637	117

According to the DIBELS Next DCSs for the first assessment for baseline, 117 of the 1,850 third-grade students were identified as Tier 2 students. A typical

RtI model shows 80% of students reading at grade level in Tier 1, while 10%-15% may fall in the Tier 2 struggling range, and 5% fall in the Tier 3 intensive range. In the district studied, the student participants in the Tier 2 struggling range were determined to be 6% of the grade level, which falls in the normal range of 10%-15% of students who struggle in meeting grade level expectations for reading progress in a typical RtI model.

Participant demographics. There was a total of 117 students identified as a group for this study based on their DIBELS Next reading assessment DCS. Their DCS for reading indicated they fell in the Tier 2 level for reading intervention. These students were placed in a reading intervention for a period of 30-45 minutes per day for at least 4 days per week. Groups of Tier 2 students were small, most in the 8-12 participant range with some groups including only 5-8 students. Each Tier 2 small-group reading intervention was taught by a credentialed hourly teacher specifically trained by the district to use remedial curricular materials, such as Project Read Phonology and Voyager. Site administrators were responsible for ensuring schedules were in place to provide maximum uninterrupted instructional time for Tier 2 students, as well as to provide these same Tier 2 students with access to grade-level language arts reading materials during the school day. Table 2 provides the descriptive data for participating Tier 2 students.

Table 2

Descriptive Statistics for Students in Tier 2 Intervention

Variable	*n*	%
Gender:		
Male	76	65.0
Female	41	35.0
English learner status:		
No	73	62.4
Yes	44	37.6
Free and reduced-price lunch status		
No	56	47.9
Yes	61	52.1

Of the 117 students identified as Tier 2 students, there were 76 male students and 41 female students. Approximately 38% of the students, or a little over one third, were English learners. Students who qualified for free or reduced-priced lunch represented 52% of the Tier 2 group. As reported, the group of 117 students in Tier 2 represented 6% of the total third-grade student population during the 2012-2013 school year. During the first baseline assessment in September there were 117 students assessed, and the number of students dropped to 114 midyear. The final assessment benchmark in late May yielded 108 valid scores. The change in participant numbers equates to an 8% drop in participants for the final reporting period.

Table 3 indicates the reading outcomes for students in Tier 2 reading interventions with minimum, maximum, mean, and standard deviation scores.

Table 3

Reading Outcomes for Students in Tier 2 Intervention

Reading Outcome Scores	*n*	Min	Max	*M*	*SD*
Baseline (September)	117	180	219	200.24	12.59
Midyear (January)	114	129	246	245.40	41.21
End of year (May)	108	120	445	296.48	50.47
Change score (May – Sept.)	108	62	248	95.93	49.89

The average (mean) baseline reading score at the beginning of the year was 200 DIBELS DCS points. For the midyear assessment, the mean was 245 DIBELS DCS points. This is an increase of 45 points in the mean score from September until the end of January. By the end of the year, the mean was 296 points, representing an average growth of 96 points in the mean score from the beginning of the year until the end of the year. The largest point growth occurred in the second half of the year, from February to late May, with a 51-point growth compared to a 45-point growth from September to January. Students participating in Tier 2 reading intervention through the RtI model showed a large mean change score from September to May of 95.93 points.

At the beginning of the year, the minimum score for the first baseline benchmark was 180. The minimum score dropped to 129 midyear and to 120 by the end of the year. This is a change of 62 points throughout the year. This

shows a decrease of 62 points in the minimum scores from the beginning of the year until the end of the year. Maximum scores for the DCS were 219 at the first baseline assessment, growing to 346 midyear, and finishing with a final maximum score of 445. This growth in the maximum score represents a reading change score of 248 DCS composite points from the beginning of the year until the end of the year for maximum scores. The range for the first benchmark was 39, midyear was 117, and for the final period in May was 325. The participants in this study showed an average growth of 95 points on their reading scores by the end of the year, as indicated by the mean score for reading change. Although many of the students did not move out of the Tier 2 range for "at risk," the average growth of 248 points in the DCS scores moved students closer to the benchmark.

Standard deviation is an estimate of the average variability of the data spread (Field, 2009). The standard deviation for the baseline data in September was 12.59, signifying a small deviation. This demonstrates that the scores were tightly grouped around the mean and there was not much variance. The final assessment period indicates a standard deviation of 50.488, a large standard deviation. The data points for the final assessment period in late May were spread far apart and indicate a large variance from the mean. The reading change shows a large standard deviation of 49.88. Since the standard deviation was relatively small at the beginning of the year, this indicates that student scores were close to the mean and clustered. However, by the end of the year when the standard deviation for scores and reading change were relatively large,

the student scores were further apart and showed more extremes in reading outcomes, some achieving growth and others regressing or staying the same.

t-Test Statistics

The *t*-tests are designed to compare two means based on related data. A dependent *t*-test can measure data from the same people measured at different times. In this research study the intent was to examine data collected from the same participant sample at three different assessment benchmark periods throughout the year. The first benchmark period was in September, another assessment period was conducted in late January, and the third and final assessment was administered in late May. This provided three sets of data: (a) beginning to midyear, (b) midyear to the end of the year, and (c) beginning of the year to the end of the year. Scores were evaluated to determine if the means for the different benchmark periods differed by a small amount or a large amount. Using these data statistical significance can be determined.

Paired samples statistics. A dependent paired sample *t*-test was conducted for this study to determine the differences and compare the two sample means of the assessment periods, September to January and January to May. It also included a comparison of differences from the baseline (September) until the end of the year assessment in May. This was used to test the hypotheses that there is a statistically significant change in reading outcomes for students participating in Tier 2 reading intervention during each assessment period. The analysis includes results from the *t*-tests, significance, and standard deviation. Table 4 below reports the data for the paired sample statistics.

Table 4

t-Test Results for Paired Samples Statistics for Three Benchmark Assessments

Pairs	*M*	*n*	*SD*	*Std. Error Mean*	*t*	*Sig (2 tailed)*
Pair 1					-11.779	.000
Baseline (Sept)	200.06	114	12.672	1.187		
Midyear (Jan)	245.40	114	41.213	3.860		
Pair 2					-13.132	.000
Midyear (Jan)	245.88	105	42.169	4.115		
End of year (May)	297.47	105	50.638	4.942		
Pair 3					-19.983	.000
Baseline (Sept)	200.56	108	12.592	1.212		
End of year (May)	296.48	108	50.468	4.856		

For the first pair from baseline to midyear the change in mean was 45.34, while the change in mean for the midyear to the end of the year was 51.59. The largest difference in the means occurred in the third pair from baseline to the end of the year, with a change of 95.93. This confirms the results found in the descriptive statistics. The standard deviation increased for each benchmark assessment period, which indicates more variance from the mean by the end of the year. On average, participants experienced greater reading outcomes for the period between the benchmark period in September ($M = 200.06$, $SE = 1.187$), to the end of the year in May ($M = 296.48$, $SE = 4.856$). Participants in Tier 2 reading intervention for this model showed reading growth in mean scores in all

three assessment periods, with the largest growth reported from the beginning of the year to the end of the year.

Between the baseline in September and the midyear assessment in January there was a decrease of 3 students in the group from 117 to 114. Of the 114 students assessed, 99 students increased their reading score, which represents 87% of those third-grade participants in Tier 2 who demonstrated growth. From the second benchmark period in January until the third benchmark period in May, the group numbers declined to 108 students. During that period 94 students, or 82%, made progress on their DCS reading scores. The final period measured was from September (baseline) to May (end of the year), and during that time 103 of the 108 students showed an increase in reading scores, representing 95% of the third-grade students participating in Tier 2. Only 5% of students participating in the Tier 2 reading intervention through RtI stayed the same or failed to show progress.

Paired samples correlations. This study examined the relationship (correlation) between time spent in RtI over the three benchmark assessment periods and reading outcomes. In order to examine whether more time in Tier 2 of RtI reading intervention improves, decreases, or maintains outcomes, the researcher used a paired samples correlation. The results displayed in Table 5 show effect size and probability as factors in determining the relationship between variables.

Table 5

t-Test Results with Sample Correlations by Data Collection Period

Time A	Time B	*n*	Correlation	Sig.
Baseline	Midyear	114	.163	.084
Midyear	End of year	105	*.637	.000
Baseline	End of year	108	.171	.077

*$p < .001$.

The data indicates that students' participation in Tier 2 RtI reading intervention from midyear to the end of the year has a large effect size (.637) and is statistically significant at $p < .001$. The probability of getting this correlation if there were no relationship between the variables is very low. This correlation measures covariance between the variables but does not indicate causation. Since this is a positive correlation, it shows the strength of the relationship. Therefore, there is a positive relationship between students' participation in Tier 2 of RtI reading intervention and improved reading outcomes. The two variables are significantly correlated. Since the period from midyear to the end of the year was 15 weeks as opposed to 10 weeks and this is a statically significant correlation, more time spent in RtI yields greater growth in reading scores.

Paired samples test. Three samples of data were collected and the sample means calculated. These means were analyzed for minor and major differences. The reading assessment data comes from the same participants in Tier 2 of the reading intervention. Large differences in the means for the three assessment benchmark periods would provide confidence that the sample

means differ due to the intervention. Outlined in Table 6 below are the paired samples *t*-tests for reading outcomes by collection period.

Table 6

I-Test Results Comparing Reading Outcome Scores by Data Collection Period

					95% CI	
Time A	Time B	*M* difference (A-B)	*SD*	*t*	LL	UL
Baseline	Midyear	-45.34*	41.10	-11.78	-52.97	-37.72
Midyear	End of year	-51.59*	40.26	-13.13	-59.38	-43.80
Baseline	End of year	-95.93*	49.89	-19.98	-105.4	-86.41

*$p < .001$.

The results of the repeated measures analysis of variance (ANOVA) indicated that the overall change model incorporating baseline, midyear, and end-of-year DIBELS DCSs was statistically significant across all three data collection periods—$F(1.86, 104) = 253.53$, $p < .001$. Individual comparisons between time periods are displayed in Table 6. All *t*-test comparisons yielded statistical significance at the $p < .001$ level. The largest mean score difference was between baseline and end-of-year DIBELS DCSs—$t(107) = -19.98$, $p < .001$. Students participating in Tier 2 reading intervention in this RtI model demonstrated statistically significant growth for each of the three benchmark assessment periods, with the largest significant growth measured from the beginning of the year to the end of the year, with a 95.93 point growth. This provides confidence that the change in reading scores is positively related to the intervention.

Multiple Regression Statistics

Regression analysis was the final series of statistical analyses conducted. A way of predicting the value of one variable from another, regression analysis is often used as a linear model of the relationship between two or more variables (Field, 2009). In a regression model, a predictor (independent variable) and the outcome (dependent variable) are continuous. In this study, I identified predictors that may influence reading outcomes. Since data was collected from all schools across the district for third grade, and this group was representative of the district make-up, independent variables or predictors, including gender, free and reduced-priced lunch qualification, and English learner status, were used as independent variables. These are considered factors by researchers, district, state, and federal educators that may have an effect on reading outcomes. The equation that was used was:

$$\text{Outcome Y (reading achievement)} = \beta_0 + \beta_1 \text{ (gender)} + \beta_2 \text{ (free and reduced-price lunch)} + \beta_3 \text{ (English learner status)} + \beta_4 \text{ (RtI participation)} + \varepsilon$$

The statistics examined in this multiple regression include descriptive, correlations, model summary, ANOVA, coefficients, and an overall results table. Descriptive statistics report the number of the sample, mean, and standard deviation. Correlations use Pearson correlation (*r*), significance, and number of participants to determine if the independent variables and dependent variable are related. In the model summary the *r*, *r* squared, adjusted *r* squared, and standard error, along with F change and degrees of freedom, are described showing the

variance among independent variables. The ANOVA table reports the sum of squares, mean, and significance indicting whether the combination of the variables significantly predicts the dependent variable. In the coefficients table all independent variables showing significance are reported. Finally, a summary of the results of regression provides information about all predictors. Table 7 indicates the descriptive statistics for the multiple regression.

Table 7

Multiple Regression Analysis of Descriptive Statistics on Reading Outcomes

Predictor	*Mean*	*Std. Dev*	*N*
Reading change	95.926	49.887	108
Gender	.32	11.52	108
English learner status	.36	11.02	108
Free and reduced-price lunch	.50	.502	108

The number of participants included in the final reading outcomes was 108 students. The mean for reading change was 95.926, which is the average score for participants. There is also a large standard deviation of 49.887, which indicates a lot of variability in the scores when examining reading change. The mean for gender and English learner status were 0.32 and 0.36 respectively. Students identified as qualifying for free and reduced-price lunch had a mean of 0.50. The means for all three independent variables were comparable and did not differ by a large amount. Since these means come from the same population, they are expected to be approximately equal with little or no differences. Large differences in the participant group means occur very infrequently. When a large difference is reported it generally shows statistical significance. Since these differences are not large there is no statistical significance for the three independent variables for reading outcomes.

Standard deviations for gender, English learner and free and reduced-price lunch status were small and clustered around the mean, indicating not much variance in the student scores regardless of their status. For gender, the

standard deviation was 11.52, while standard deviation for English learners was 11.02. For those students identified as free and reduced-price lunch status, the standard deviation was 0.502. These standard deviations are not largely different. Regardless of gender, English learner status, or free and reduced-price lunch status, the majority of students who participated in Tier 2 interventions made reading gains. Their gains are not attributed to their subgroup status, as determined by the three independent predictor variables that were chosen for this study.

Correlations for the multiple regression are recorded in Table 8. This examines the relationships between reading change and the independent variables of gender, English learner, and free and reduced-price lunch status.

Table 8

Multiple Regression Analysis for Correlations for Reading Change (N = 108)

	Reading	Gender	EL	FRL
Pearson Correlation:				
Reading change	1.000	.071	-.011	-.100
Gender	.071	1.000	-.109	-.059
EL status	-.011	-.109	1.000	.482
FRL status	-.100	-.059	.482	1.000
Significance (1-tailed):				
Reading change	.	.232	.454	.151
Gender	.232	.	.131	.271
EL status	.454	.131	.	.000
FRL status	.151	.271	.000	.

Multiple regression analysis was conducted to investigate if gender, English learner status, or free and reduced-price lunch status were predictors of reading change. The results for correlations in Table 8 indicate the relationships between each of the independent predictor variables and reading change. The combination of the independent variables, gender, English learner status, and free and reduced-price lunch status were not statistically significant, with $p = .232$ for gender, $p = .454$ for English learner status, and $p = .151$ for free and reduced-price lunch status. None of these independent variables was found to be predictors for reading change since there was no significance value of $p < .05$. Regardless of gender, English learner status or free and reduced-price lunch status, the majority of students participating in Tier 2 interventions for reading demonstrated growth in reading scores. The following two tables (9 and 10) provide additional data from the multiple regression in the form of model summary and ANOVA tables.

Table 9

Multiple Regression Analysis Model Summary for Selected Independent Variables

					Change statistic		
Model	*R*	*R* square	Adjusted *R* square	Std. error of the estimate	*R* Square change	*F* change	*df1*
1	.129	.017	-.012	50.17756	.017	.588	3

Multiple regression results in the model summary indicate that the multiple correlation coefficient or correlation between the predictor and outcome of reading change was $R = .129$, which indicates that there is 1% chance these

variables are correlated. It also indicates the amount of variance in the outcomes on reading change that is explained by the predictors. The data suggests that there is –0.012 or –1% of the variance in reading outcomes that can be predicted by the independent variables of gender, English learner status, or free and reduced-price lunch status. Since the difference in variance is not relatively small it points to the fact that the variables are not generalizable for any population other than the participants for this research. The spread of the error variance is 50.178, which shows a wide spread of scores. ANOVA results in Table 10 include more data to support the findings.

Table 10

Multiple Regression Analysis of ANOVA for Selected Independent Variables
ANOVA[a]

Model		Sum of squares	*df*	Mean of squares	*F*	Sig.
1	Regression	4441.518	3	1480.508	.588	.624[b]
	Residual	261849.890	104	2517.787		
	Total	266291.407	107			

Data from the analysis of variance indicates that the combination of the independent variables of gender, English learner, and free and reduced-price lunch status do not significantly predict reading outcomes or change in reading scores for those third-grade students who participated in the Tier 2 reading intervention for this study, with $p = .624$. The ANOVA model is significantly better at predicting the outcome than using mean as a measure. This model tells us if there is an overall fit of the data and can confirm other findings. Since the p value

is greater than $p < .05$, there is no statistical significance in the independent variables' being predictors to reading outcomes. To determine further statistical significance, Table 11 reports data from the multiple regression analysis for coefficients.

Table 11

Multiple Regression Analysis of Coefficients for Selected Independent Variables Coefficients

	Unstandardized coefficients		Standard coefficients		
Model	*B*	Std. Error	Beta	*t*	Sig.
(Constant)	97.554	7.949		12.272	.000
Gender	7.415	10.378	.070	.715	.477
English second language	5.742	11.521	.056	.498	.619
Free/reduced-price lunch	-12.209	11.021	-.123	-1.108	.271

Multiple regression results for coefficients indicates that none of the demographic independent variables included in this study, gender, English learner status, or free and reduced-price lunch status resulted in statistical significance in predicting reading outcomes for students. The independent variable of gender had a *t* value of 0.715 and a significance level of $p = .477$, while English learner status had a *t* value of 0.498 with a significance value of $p = .619$. The independent variable of free and reduced-price lunch status showed a negative value of $t = -1.108$ and $p = .271$. The beta value tells us that reading outcomes will increase by 0.070 with gender, 0.056 for English learners, and –

0.123 for free and reduced-price lunch status. Since all of the *p* values for the three independent variables did not indicate $p < .05$, none of the variables are significant predictors in reading changes. In Table 12, a summary of the multiple regression analysis is presented.

Table 12

Results of Regression of Reading Outcome Change

Predictor	*B*	*SE*	*b*	*t*	*p*
Gender	7.42	10.38	.07	.72	.477
English learner status	5.74	11.52	.06	.50	.619
Free and reduced-price lunch status	-12.21	11.02	-.12	-1.11	.271

Note. $R = .13$, $R^2 = .02$, adjusted $R^2 = -.01$, $F(3, 104) = 0.59$, $p = .624$.

To summarize the results of the multiple regression analysis, Table 12 was created. When regressing the reading outcome change scores onto the independent demographic variables of gender, English learner status, and free and reduced-price lunch status, it was found the analysis yielded no statistically significant results—$F(3, 104) = 0.59$, $p = .624$. Therefore, none of the demographic independent variables predicted a change in reading outcomes. The majority of students who participated in the RtI reading intervention at the Tier 2 level made reading growth regardless of their gender, English learner status, or free and reduced-price lunch status. None of these predictors made a significant difference in improving reading scores for students who participated in the Tier 2 reading intervention.

Summary of the Findings

This research study used quantitative analysis to determine whether reading outcomes improved after students participated in Tier 2 reading interventions through an RtI model. The study used a one-group pretest-posttest design to analyze student reading scores measured by DIBELS Next. Data was collected three times for the year 2012-2013. Descriptive statistics revealed that the minimum score for the 117 participants was 180 at the beginning of the year, while the maximum score was 219. By the end of the year the minimum score was 120 while the maximum score was 445. The mean score at the beginning of the year was reported as 200, midyear was 245, and the end of the year was 296. The mean reading change from September to May was 95.93 points. The data also indicated that there were 65% male and 35% female students. There were 38% English learners, and 52% of the students qualified for free and reduced-price lunch.

The *t*-tests were conducted to determine the changes in assessment benchmark periods and whether those changes were significant. This compared the two means with the related data from all three periods: beginning of the year, midyear, and end of the year. Results indicated that the overall change model for baseline (beginning of the year), midyear, and end of the year DIBELS DCSs was statistically significant for all three data collection time periods. All *t*-test comparisons yielded statistical significance at the $p < .001$. The largest mean difference was 95.93 from the beginning of the year to the end of the year. Of the students participating in the Tier 2 reading interventions for the 2012-2013 school

year, 87% increased their reading scores from the beginning of the year to midyear, 82% increased their scores from midyear to the end of the year, and 95% of the participants increased their scores from the beginning of the year (September) to the end of the year (May).

Finally, a multiple regression analysis was conducted to explore the demographic independent variables of gender, English learner status, and free and reduced-price lunch status. I expected to determine what predictors might affect reading outcome and change. Results of the multiple regression analysis found that none of the demographic independent variables was statistically significant in predicting the reading outcomes or change- $F(3, 104) = 0.59$, $p = .624$. Regardless of gender, English learner status, or free and reduced-price lunch status, the majority of third-grade students participating in Tier 2 reading interventions in this RtI model made significant reading growth for each assessment period with the largest growth in the final period from the beginning of the year to the end of the year. Chapter 5 will summarize the significance of the findings, discuss limitations, and provide implications, recommendations, and reflections.

CHAPTER 5

DISCUSSION

This study investigated the relationship between RtI reading interventions and change in reading outcomes for third-grade students who participated in a Tier 2 level reading intervention. The purpose was to gain insight into the effectiveness of the RtI reading interventions and what connection participation in the intervention had on improving reading scores for fluency and comprehension. This chapter is organized to present several sections to finalize the study: (a) an overview of the dissertation; (b) conclusions and interpretation of the findings of the research; (c) the strengths, weaknesses, and limitations of this one-group pretest-posttest design; (d) the implications for educational practice and leadership; (e) recommendations for future research and how this research contributes to the body of existing research; and (f) my reflections on the research and how this will impact me as a school leader and instructional change agent for closing the achievement gap in reading.

Overview of the Study

The purpose of this study was to examine the relationship between participating in RtI reading intervention and improved reading scores for third-grade students. This study was centered in a large Southern California school district where a three-tiered RtI model had been implemented for the past 4-5 years. Students who were considered just below grade level in reading as

measured by DIBELS Next reading assessments and who participated in Tier 2 of the reading interventions were selected for this study. Research questions were formulated to gather and examine reading assessment data for the 2012-2013 school year in order to make conclusions about how to best proceed in helping students reach their full potential and close the achievement gap in reading. The overarching question addressed in this research was: Does participation in an RtI reading intervention help to improve reading outcomes? Three specific research questions were investigated in this study:

1. What are the changes in reading outcomes for students who participated in a year-long Tier 2 RtI reading intervention?
2. Are there differences in outcomes for students who participated in a year-long Tier 2 RtI reading intervention for the three benchmarks?
3. After controlling for student demographics (gender, English learner status, and free and reduced-price lunch status), what is the effect of RtI on reading outcomes for those students in Tier 2 reading intervention?

With increased accountability for schools to improve student performance each year and demonstrate academic growth, especially in reading, the rationale for this research was founded in the intense need to close the achievement gap in reading. Reading is essential and considered the key to success in school. The literature indicates that reading failure in early grades is costly to education in terms of special education, retention, delinquency, and remediation (Chambers et al., 2011). Furthermore, low reading skills are associated with dropout rates

and unemployment, and this negatively impacts society (Cummings et al., 2011). With reading scores indicating that two thirds of students in fourth grade across the nation do not read at grade level, schools are searching for ways to improve and intensify reading instruction with interventions (Ortlieb et al., 2012). Under NCLB, the federal government set goals for reading programs for students in K-3, and all students are expected to be reading at or above grade level by the end of third grade (Ellis, 2007). With these goals in mind schools are working to implement intervention models, such as RtI, to address deficits in reading and improve reading outcomes.

The review of the literature suggests more research is needed on interventions implemented through RtI models. Chard et al. (2008) found in a multilevel RtI reading model that students in kindergarten and first grade improved in reading fluency rates and standardized test scores. This study was done as a longitudinal study in two different states. In a meta-analysis review of the literature, Tran et al. (2011) conducted a synthesis of 13 studies and found that all effect sizes increased for reading. Despite the improved reading scores, RtI did not show overall effectiveness. A longitudinal study that followed kindergarten students to third grade reported that students in seven elementary schools responded positively to the intervention, exceeding the 50th percentile on measures (Simmons et al., 2008). Finally, in research on first-grade students, Case et al. (2010) found that the short-term intervention for reading had a significant effect on reading skills. Studies are mixed in their report of results.

Peter Senge said, "What we have learned about teaching and learning in the last 15 years is among the most exciting discoveries of our 200-year history" (as cited in Schmoker, 1999, p.70). Studies show that students learn best when basic skills are taught within a meaningful and challenging context. Low-performing students have the most to gain from effective programs that demonstrate significant improvement when interventions and challenging strategies are implemented. Therefore, it is imperative that schools have successful early intervention programs that include systematic regular assessments in order to monitor progress and improve instruction (Schmoker, 1999). The goal is to increase the number of lower level students who move into the grade-level reading group and to no longer require interventions to close the gap in reading. This study explored the effectiveness of RtI reading intervention and whether students who participated in the Tier 2 intervention were able to improve reading outcomes through the intervention. The intention of this study is to add to the body of research in closing the achievement gap in reading.

Conclusions

This research study used quantitative analysis to determine whether reading outcomes improved after students participated in reading interventions through an RtI model. Students who were grouped in the Tier 2 interventions were examined using a one-group pretest-posttest design to analyze student reading scores measured by DIBELS Next. Data was collected three times for the school year 2012-2013. The overall question for this study was Does participation in RtI reading intervention improve reading scores? This study found

that for third-grade students participating in a Tier 2 reading intervention through RtI, reading scores improved significantly regardless of gender, English learner status, or free and reduced-price lunch status. In the first assessment benchmark, 87% of students improved reading scores, while 82% improved from midyear to the end of the year. Overall, from the beginning of the year to the end of the year, the participants demonstrated the greatest growth with 95% of students showing growth in their reading scores. The mean change score for reading outcomes was 95.93 DCS points from the beginning of the year to the end of the year.

Research Question 1

Descriptive statistics revealed information to answer the first research question: What are the changes in reading outcomes for students participating in a year-long Tier 2 reading intervention? The minimum score for the first benchmark was 180, while the maximum score was 219 in September. That range was 39 points. By the end of the year the minimum score was 120 while the maximum score was 445. This indicates a range of 325 points. The mean score was reported as 200 at the beginning, midyear was 245, and the end of the year was 296. The reading change from beginning of the year to midyear was 45 points, while the reading change from midyear to the end of the year was 51 points. The total reading change from the beginning of the year to the end of the year was 95.93 points.

To be considered grade level for third grade, a student must have a DIBELS DCS of 220 at the beginning of the year, 285 midyear, and 330 by the

end of the year. The mean score of 296 points at the end of the year indicates the average score by the end of the year was 34 points away from grade-level expectation. Of the 108 students at the end of the year, 40% (27 students) scored at grade level, with 330 or higher, while 95% of the participants showed statistically significant growth in reading scores from the beginning of the year to the end of the year.

These findings support the first hypotheses that that the majority (95%) of third-grade students who participated in the Tier 2 reading intervention of this RtI model showed significant growth in their reading scores from the beginning of the year to the end of the year. A majority of students also demonstrated significant growth in reading scores for the first assessment period from September to January, with 87% achieving higher reading scores. The second assessment period, from January to May, also indicated that the majority of students improved their reading scores, with 87% showing improvement. Overall, from September to May only 5% of third-grade students participating in Tier 2 reading interventions stayed the same or regressed in their reading scores.

Research Question 2

The second research question was "Are there differences in outcomes for students participating in Tier 2 reading interventions for the three assessment periods and are they significant?" The *t*-tests were conducted to determine the changes in assessment benchmark periods and whether those changes were significant. This compared the two means with the related data from all three periods: beginning of the year, midyear, and end of the year. Results indicated

that the overall change model for baseline (beginning of the year), midyear, and end of the year DIBELS DCSs was statistically significant for all three data collection time periods, $F(1.86, 104) = 253.53$, $p < .001$. All *t*-test comparisons yielded statistical significance at the $p < .001$. The largest mean difference was 95.93 from the beginning of the year to the end of the year.

During the first month of intervention, students continued to be assessed and groups were flexible, with some movement in and out of the intervention. Once groups began, there were 10 weeks of intense instruction in the Tier 2 intervention, with a two-week break for the holidays. Reading intervention teachers became familiar with students in the group and with their individual needs and skill deficits. The growth of 45 points was significant and represents a time period that was a bit shorter than the benchmark for the later part of the year. The second benchmark period in this study showed slightly more growth, with a 51-point increase in the mean scores. Factors contributing to this could be familiarity of the teacher, student group make-up, materials, and procedures. Once the sustained uninterrupted time started, students began to build confidence and skills through continued practice. The final benchmark period created more urgency to make growth as students and teachers were approaching the year-end expectations and were held accountable for growth. In addition, this was a slightly longer period of time with 15 weeks of instruction.

By using a dependent sample *t*-test, it was determined that students in Tier 2 reading intervention made statistically significant progress in reading growth for the first and second benchmarks and the most significant growth from

the beginning of the year until the end of the year as a measured time period. This supports the second hypotheses that third-grade students who participated in Tier 2 reading interventions would make incremental growth on reading scores for each of the three benchmark periods. In all three assessment periods, students showed growth on reading scores, $F(1.86, 104) = 253.53$, $p < .001$. All *t*-tests comparisons yielded statistical significance at the $p < .001$. Comparing the means using a *t*-test confirmed that students were able to make significant growth on reading outcomes for each of the three benchmark periods, with the most growth from September to May.

Research Question 3

A multiple regression analysis was conducted to answer the third research question: After controlling for student demographics (gender, English learner status, and free and reduced-price lunch status), what is the effect of RtI on reading outcomes for those students in Tier 2 reading intervention? This explored the independent demographic variables of gender, English learner status, and free and reduced-price lunch status, and their effect in predicting reading outcome scores. Results of the multiple regression analysis indicated none of the independent variables was statistically significant in predicting reading outcomes or change, $F(3, 104) = 0.59$, $p = .624$. Regardless of gender, English learner status or free and reduced-price lunch status, the majority of students participating in Tier 2 reading interventions in this RtI model were able to make significant progress in their reading scores, demonstrating growth. In fact, 40% of

the participants reached grade-level expectations for the end of the year for reading as measured by DIBELS Next.

The data indicated that all of the independent variables (gender, English learner status, and free and reduced-price lunch status) were not predictors of reading outcomes or reading change and did not positively or negatively affect reading scores. None of the independent variables had statistical significance in determining a student's reading change. It was determined that 95% of students participating in Tier 2 reading interventions increased their reading scores from the beginning of the year to the end of the year, while 5% of students showed no growth in reading scores or regressed. Of the 95% of participants who increased their reading score during the year, 40% of those students reached grade-level expectations for reading by the end of the year. The independent variables of gender, English learner status, or free and reduced-price lunch status were not found to influence their progress or lack of progress in improving reading scores.

The data from the multiple regression analysis confirms the third hypotheses indicating that regardless of the three independent variables of gender, English learner status, and free and reduced-price lunch status, the majority of third grade students participating in the Tier 2 interventions were able to increase reading scores. Their status in regard to those three independent variables did not predict reading outcomes. The hypothesis tested was that regardless of gender, English learner status, or free and reduced-price lunch status, students would demonstrate growth in reading outcomes after participating in RtI Tier 2 reading interventions. This study concluded that there

was no statistically significant difference in males and females, English learners and English speakers, or those students receiving free and reduced-price lunch and those who do not. Regardless of status, a majority of students, 95%, were able to demonstrate growth in reading outcomes.

Strengths, Weaknesses, and Limitations

This research was conducted in a large Southern California school district. The strength of the research is my strong and intricate knowledge of the district's RtI model and the district's foundation in building the RtI model. I had a good working knowledge of all the parameters of the process in implementing RtI and the policies used in this district model. This was helpful in understanding and examining the data from all 21 elementary schools in the district and knowing what to look for. As a part of the pilot when RtI was first introduced, I also continued on to the steering committee helping to guide decisions that would affect the outcome of how RtI was implemented; this background knowledge was invaluable. An inside understanding of the assessments, progress monitoring, and the structure of the RtI model was helpful in analyzing the data as was my background knowledge regarding data-driven instruction, underperforming schools, and quantitative data.

The RtI model in the participating district was grounded in educational research and was a strength of this study. Implementation of the RtI model across all 21 elementary schools occurred only after piloting, much discussion and input from the steering committee and stakeholders, and training for all involved in how to administer assessments, curriculum and materials, and

progress monitoring and conducting interventions. According to district officials the goal was to have uniformity in implementing a preventive intervention program for reading that allows all students to reach their potential and move toward closing the achievement gap for those students who do not read at grade level by third grade.

The district involved credentialed teachers, special education teams with psychologists, and administrators in the entire process. It supported schools in funding a part-time, credentialed reading intervention teacher. Intervention materials were provided and trainings for those intervention materials were held on a regular basis as needed. The results of reading assessments were monitored each year by district administrators, and school leaders were held accountable for reading progress in their schools. The data and information about RtI and reading outcomes was reported at board meetings and included in the board monitoring report at the end of each year as improving reading scores for underachievers was a focus for the board of education for the district.

The weakness in this research was the limited amount of time and number of groups for which the data was collected. The assessments were examined for a 1-year period (three assessment benchmark periods) and for specifically one grade level (third grade). To achieve a deeper look at the reading progress of students who participated in RtI reading interventions, a longitudinal study of 3 or more years should be conducted. In addition, it would be beneficial to examine if students in other grade levels were able to demonstrate improvement in reading after participating in RtI reading interventions. Discovering which groups (tiers) or

grade levels of students demonstrated the most growth while participating in RtI would also expand this study to determine how early interventions can be implemented to statistically improved reading outcomes and what the relationships are for RtI and reading outcomes in primary in comparison to upper grades.

This study focused on only those students who were identified in the Tier 2, or struggling level, for reading, since they are the most likely to show improvement after participating in interventions. Since the implementation of RtI reading interventions, concerns have been expressed about how long a child stays in the Tier 2 intervention and whether the same students are in the Tier 2 intervention year after year, never moving out to the general education classroom to receive grade-level instruction during that portion of their reading time. The findings in this study showed that 95% of the students demonstrated growth in their reading scores but only 40% achieved grade-level mastery by the end of the year. That means that 55% of these same students will be placed in Tier 2 level reading interventions the following year. Although 40% of participating students moved into the grade-level zone, 60% of students will continue to need a Tier 2 reading intervention the following school year. How long will it take them to reach grade level and at what rate?

Another question that remains to be answered is the reading progress for those students participating in the Tier 3 level, where the intervention is intense and out of grade level. These are the neediest students and are considered two years or more behind in reading achievement. Does the intervention make a

difference for them and how many years does it take for them to catch up with their grade-level peers if they ever do?

Another weakness of this study was that only one measure for reading progress was used. Although this measure is research based and considered a valid measure of student reading progress, using multiple measures for measuring progress would provide additional information as to a child's ability in reading and whether their reading scores improved over time with implementation of Tier 2 reading interventions through RtI. Finally, there was no ability to account for fidelity to the RtI program, groupings, and curricular materials in this study. Although the intent and expectations were for every school to be uniform in how they implement the intervention and monitor progress, I am unable to confirm that everyone was held to the highest of standards.

Implications for Educational Leadership Practice

This research study is relevant to educational leaders because of the intense need to close the achievement gap and provide effective interventions for students who are struggling in reading. It explores the use of an RtI model for reading intervention that acts as a preventative measure for students who are considered at risk. By addressing these student needs through a Tier 2 intervention, educational leaders will be able to support struggling students and make gains in reading achievement. Three key components are important to note: effective teaching, a data-driven approach, and a sustainable, well-planned RtI model of intervention.

For Practitioners

Effective teaching of reading. Teachers need to be cognizant of teaching reading in their classroom to all students, beginning in kindergarten. All teachers should consider themselves teachers of reading regardless of their assignment. The use of effective research-based strategies and key components of reading are imperative to teaching all children to read. To teach reading, teachers must use explicit, direct instruction to provide students with the opportunity to learn the five key components of reading: phonemic awareness, phonics, text fluency, vocabulary, and comprehension. There are specific methods to be used in directly modeling and allowing for guided practice for each of these key components. The instruction for reading needs to show balance, with isolated instruction for these components as well as integration of each component into, through, and beyond reading, to include listening, speaking, and writing of language as well.

Using a balance of literature and expository reading materials appropriate for the grade level will assist students in achieving their goals for reading. Students need to read orally every day to practice fluency and participate in discussions about the reading content. Reading becomes increasingly difficult when reading materials shift from literature to informational reading such as content area reading in social science and science. A variety of reading materials should be available and accessible through libraries, classrooms, and visuals in the classrooms such as charts, whiteboards, and screens. Students need to be exposed to all types of reading every day with a variety of ways to read: teacher

reading, whole group reading, small group reading, choral reading, partner reading, and individual reading. This builds skills and confidence and creates a safe environment for reading.

It is important to note that teachers must hold high expectations and motivate and support students, scaffolding and accommodating when needed so student are fully able to participate in their grade-level reading materials. This provides access to higher level vocabulary, comprehension, critical thinking, and reading skills. Challenging and advancing students are critical, since reading materials progress in rigor and difficulty at a rapid rate after second grade. Students not reading at grade level should be provided appropriate differentiation to help building their deficit skills through small group instruction for a short sustained period of time in addition to participating in the regular grade level classroom instruction. Understanding and mastering the foundations of reading step by step will enable students to meet their grade level expectations.

Data-driven approach. Educators benefit from analyzing data and using the results to change instruction. By using multiple sources of data and examining progress during specific time periods during the year, teachers and site administrators are able to identify strengths and weaknesses in instruction and target areas of need. Students who are not meeting grade-level expectations in reading can be identified using appropriate research-based assessments. By using the data available, specific skill deficits can be identified and remediated. Targeting these skills and providing a structured intervention for these students enable educators to provide opportunities for students to meet reading goals for

their grade level. Knowing a student's reading performance and challenging them to improve and read at the next level will help close the achievement gap in reading.

Mike Schmoker (1999) states that there are keys to improving our schools. His plan for continuous improvement is based on recognizing data and its merits. In his book, he states there are several areas where educational leaders can focus to provide a framework for student growth. The first area is effective teamwork. The idea is to work collaboratively with a team of educators who can analyze data, share best practices, and support each other in addressing student needs. Second, Schmoker provides a case for creating measurable goals based on the student's performance data. Educators must examine the available data (multiple sources) and target areas of need with goals that are achievable but challenging. Then a plan for interventions must be implemented and activity-based learning should be compared to results-driven programs. Educators must work on quantifiable results for students to succeed. Finally, research and development is important to this model in terms of using research to inform and direct decisions for student improvement. This data-driven results model is a step for improving reading outcomes for students.

RtI model for reading intervention. Practitioners in today's school are looking for structure that will provide opportunities to remediate and improve reading skills for struggling students. A multi-tiered RtI model that provides leveled instruction for students at grade level, for struggling students performing below grade level, and for those needing intensive intervention is the most

commonly used model. The RtI model must be structured to provide a dedicated, uninterrupted time for reading interventions and be scheduled for a short, sustained amount of time of 30-45 minutes per day for 4 or 5 days per week. This reading intervention time should be above and beyond the classroom instruction for language arts so students are not prevented from accessing their grade-level instruction to keep up with the expectations. In addition, it is recommended that highly qualified credentialed teachers who plan, prepare, and deliver the lessons are a key component in an RtI model.

In measuring where students should be placed in the RtI model, educators need to use assessments that are research based and are considered a valid measure of reading progress. This includes measuring all of the components of reading, including phonemic awareness, phonics, fluency, vocabulary, and comprehension. In order to successfully administer reading assessments, staff members need to be trained and provided practice time to use the assessments and become familiar with how to administer them and how to interpret results of the assessments. This will increase the validity of results and allow for proper placement of students in the intervention. Without valid identification and proper placement in groups, students' reading scores can stagnate or regress. Students with lower expectations and reading practice struggle with the rigor of their grade level when moving back into the classroom. Another key component in a successful RtI model is the provision of instructional reading materials that are scientifically based and supported for each tiered level: The reading passages should be leveled to different degrees and incorporate a mix of literature and

expository reading. These adopted materials should include components for skills in phonics, vocabulary, fluency and comprehension.

For Future Scholarship and Research

This research study could be expanded to include several parameters to further the research on effective reading interventions. Providing a more in-depth and longitudinal study of students with reading gaps and how they progress is a first step. The same cohort could be followed for a 3-year period measuring their reading progress through three different grade levels. Alternatively, three years of monitoring reading progress for three different groups of students in one grade level and comparing results from year to year would be another way to expand the data. Additionally, an expansion of this research might include following three or more grade levels to compare results of participating in RtI reading interventions by grade level (age). This would address early intervention and its impact on reading outcomes to determine if reading interventions are more successful in primary grades or across grade levels. Finally, this research presents opportunities to measure intervention results in other districts and states to determine the effectiveness of programs and RtI models across the country.

Recommendations

For Future Research

Educators have struggled with students performing below grade level in reading for years. With the publication of *A Nation at Risk* in 1983, there has been increased public and political attention regarding student achievement and the success of public schools (Borek, 2008; Deville & Chalhoub-Deville, 2011).

New federal and state government mandates that hold schools accountable for student achievement in reading and math have increased awareness of those students who are not meeting the grade. As schools begin to examine how to best serve underperforming students, RtI models of intervention have been implemented and it is important that the interventions are effective. California's Local Control Accountability Plan along with Local Control Funding Formulas connect funding in a school district to its meeting goals, especially for students who are considered at risk for reading. All funding is directly related to the state goals, which are expected to align with the strategic plan goals for a district. The interest in improving student outcomes is more visible in today's schools. Recommendations for additional research include the following:

- Research to determine the most effective reading intervention programs and strategies or best practices.
- Research to identify the most effective RtI model and which tiers are best for remediating reading and improving outcomes.
- Research indicating the most effective training models for teachers and reading specialists in order for them to be fully prepared to systematically teach using best practices and research based materials, strategies and assessments.
- Research directing educators to the value the use of student performance data and empirical research. The results gleaned from the data can be used to change instructional practices resulting in better student achievement.

- Finally, researchers can examine the best use of intervention structures, times and groupings that have the greatest effect on improving reading scores.

For Public Policy

Students who are at risk in reading achievement find success in small group interventions where reading is at their instructional level and provided on a consistent basis for a short amount of time. Hattie (2009) found positive results for students who participated in reading interventions that included meta-cognitive strategies in word recognition, reading comprehension, general reading, and vocabulary. With funding now connected to state and district goals for improving student achievement, especially in targeted subgroup populations, several recommendations are proposed for public policy:

- Provide research-based and meaningful assessment programs that are an accurate measure of student progress and provide educators with relevant data about student skills and reading levels.
- Provide adequate funding to implement intervention programs, including but not limited to the purchase materials, the cost of training, the cost of assessment times, and the costs associated with hiring highly qualified credentialed teachers to provide additional time for students to learn.
- Provide adequate staffing ratios and staffing to include a reading specialist for every grade level in every elementary school. This will provide targeted instruction to those students who are most at risk.

With this level of support from the public, educators will be better equipped to meet the needs of their students thus improving outcomes for student achievement in reading.

Reflections

My reflection on the research experience, including the impact of the results of this study and my role as an educator, include several key areas: (a) empirical research, statistics and scholarly writing; (b) effective reading instruction; (c) interventions and monitoring student growth; and (d) the impact of this study on school and district level administrators.

Empirical Research, Statistics, and Scholarly Writing

I have been trained as a data-driven instructional leader in an age of accountability. Examining research, using data to make instructional decisions, and creating new paradigms is part of prior training. Despite the fact that I possess a conceptual framework for quantitative research, learning to navigate SPSS and analyze data from the output was challenging. With guidance, perseverance, and determination, I was able to meet the demands of learning a new system for analyzing data and reaching conclusions. This is relevant for educational leaders today as we strive to become lifelong learners and make educational decisions and adjustments to teaching based on grounded data and best practices. Most districts have data management systems, as the state mandates more accuracy in data collection about students. Being able to collect, organize data, and analyze results for relative strengths and weakness is a must in today's educational environment. With funding limited and expectations high,

educators must make educational decisions that will improve academic achievement for all students, especially those who struggle. In efforts to prepare students for tomorrow's workforce, we must ensure their reading is up to standards that are rising every day. I have gained added value as an educator by learning how to manage data and make conclusions about their significance. In addition, the rigor of writing while doing empirical research was challenging helped to improve my writing and communication skills.

Effective Reading Instruction

During the course of this research, I have come to recognize the importance of using effective reading instruction in the general education classroom setting from the beginning of a student's educational career. It is imperative that we, as educators seek, out the most effective teaching strategies, materials, and supports that motivate and engage students in the learning process. The journey begins in kindergarten with teaching the components of reading. Each passing year potentially widens the reading gap for an at-risk child, who then has less of an opportunity to catch up with his or her peers in other academic areas. Since students are formally taught to read in first grade, setting the groundwork in kindergarten with recognition of letters, sounds, sight words, and phonemic awareness helps to build skills and essential foundations for reading success. Without these tools, children struggle to crack the reading code and often lose confidence in themselves and their abilities at an early age. Students need to read aloud every day in class for a sustained amount of time, to

be monitored for progress each week, and to be provided with immediate feedback for improving their reading.

Reading instruction has changed over the years from teachers doing the reading to students doing the reading. Teachers need to teach skills that are required for mastery of a concept explicitly and directly with appropriate modeling and sufficient time for student-guided practice. It is important that the teacher not only provide three to five trials for students to practice on a daily basis but also check for understanding by holding students accountable for their own progress. This immediate feedback while a student is practicing improves the skill and confidence of the student. That corrective action alone can make or break mastery of the skill. By engaging students in their own reading progress, educators can help students set goals and identify their own reading level and can hold them accountable for their learning in reading. In addition, increasing the rigor of the reading levels as the year progresses provides opportunities to meet grade-level goals as the expectations increase incrementally over time.

Interventions and Monitoring Student Growth

This research has led to an understanding of how implementing appropriately structured interventions with frequent monitoring is key to student growth. Many schools and districts have implemented RtI models that are loosely structured and have few parameters and guiding principles. In this research, the RtI model was clearly defined, well developed, with clear expectations of the structure of the intervention, including scheduling, timing and amount of time for groups, placement of student in the groups, materials to be used, and

qualifications and training of the reading intervention teachers. With all of these parameters set into place, piloted and implemented district-wide, the RtI model had a greater chance of success. The entire process was vetted through stakeholders, including the pilot team, steering committee, teachers, special education teams, administrators, and parent community. Experts in reading instruction, assessments, data collection, and intervention were all part of the team and added to the successful launch of the RtI model used in this study.

First, the help of the district administrators to provide a designated structure for scheduling that worked around release times for physical education, music, and key mandated instructional minutes, was critical in the successful implementation at school sites. Second, providing financial and training support to acquire extra staffing, a highly qualified credentialed teacher as the reading intervention specialist, was an asset to successful implementation of the RtI model. The third most important element was the adoption of designated reading materials to be used specifically for each of the intervention groups. These reading materials were targeted for the different levels of reading intervention and used for that sole purpose to enrich and remediate students in their reading skills. Finally, the philosophy of using a short sustained time block for reading intervention in addition to providing students with access to state-mandated minutes in language arts and reading gave students additional learning time for reading. All of these factors were of importance to the findings of this study.

Impact of Research on School Administrators

This research study has a great importance for school administrators today due to the critical nature of reading as a life skill. School administrators are accountable for student learning and must be ready to ensure that all students are reading at grade level and have an opportunity to graduate high school. Lack of reading skills has a great impact on the workplace and society in general. The time has come to focus on student learning instead of just teaching and to demand that we dialogue as teams to improve student performance and effectiveness in mastering skills in reading. This professional dialogue is part of what improves the strengths of any team of educators. Educators need to focus on data and results from student progress and acknowledge what students know, don't know, can, or can't do. This will lead educators to make changes in our instructional programs to address the needs of the students. The research literature is rich with recommendations and often provides specific details about the good ideas that make teachers and schools most effective (Hattie, 2009).

The most critical problem schools face is the fragmentation and overload resulting from too many different innovations, according to Fullan (as cited in Hattie, 2009). Even with thousands of research studies with relevant ideas about what makes a school effective, teachers and administrators rarely refer to this body of work, and schools look much like they did 200 years ago. The impact of knowing what is in the research could be transformational for educators if they were able to overcome the overload facing them and spend time dialoguing about teaching and learning and what good instruction is and isn't in terms of

student outcomes. It is time for school leaders can develop a visible context for learning from student, to teacher, to parent, to site administrator. Ensuring that students meet grade-level expectations in all areas, especially reading, is our responsibility.

Through this research, several key points emerged as important to providing effective interventions for students who struggle with reading. As these have been discussed throughout this chapter, this is a summary of the key recommendations for effective RtI reading interventions evolving from this study:

- Conduct and administer effective research-based screening or reading assessments and monitor progress frequently–weekly, monthly, quarterly, yearly.
- Provide differentiated reading instruction. Students who are reading slightly below grade level need a very different level of reading materials close to grade level as opposed to those students who are two or more years behind in their reading progress and working with replacement materials that are significantly below grade level.
- Use explicit, direct instruction to systematically and sequentially teach the components of reading: phonemic awareness, phonics, vocabulary, reading fluency, and comprehension.
- Daily reading experiences should include reading from both literature and expository passages and be at the child's instructional level and grade level. Interventions should occur consistently 3-5 times per week for a sustained, uninterrupted time of 30-45 minutes.

- Each individual student should be monitored for progress and provided changes to their instruction if they have improved or if they are not improving. Changes in groups, strategies, and materials should be flexible, according to the data collected from progress monitoring.
- At all times, the lowest performers should be taught by the most highly qualified instructors. Reading intervention teachers need to be the best at what they do, be highly trained, credentialed, and show results. They need to understand data-driven instruction and setting and meeting goals for improving student performance.

These key components of an effective reading intervention are critical when making decisions for implementing reading interventions.

Finally, I have come to recognize the importance of leadership and how being a visible leader who creates an environment where high expectations and goals are set and monitored on a frequent basis is critical to success for students. By supporting and engaging all learners in the learning process, including teachers in decision making and implementation, and checking on student progress weekly, I have found an increase in student performance. Being in the classroom every week and sometimes more than once a week creates an atmosphere of caring about learning and about the progress being made by students. Meeting with students in the intervention groups and talking about the yearend goals and how they might achieve their goals was motivating for students in reaching success in reading. Knowing the principal was their cheerleader in meeting reading goals helped students feel important, cared for,

and accountable. Frequent monitoring of progress, meeting with teacher teams, and dialoguing about the data and student progress forced changes to occur resulting in better performance for both students and teachers. As an instructional leader, my direct involvement in the process was critical to meaningful results.

Summary of the Dissertation

This research study examined a group of 117 third-grade students who participated in a Tier 2 level of RtI reading intervention. To answer the question "What are the changes in reading outcomes for students who participated in RtI?" I used quantitative data to support the hypotheses. Descriptive data, *t*-test measures, and a multiple regression analysis all indicated that the majority of third-grade students who participated in the Tier 2 level of reading interventions made statistically significant growth in reading outcomes regardless of their gender, English learner status, or free and reduced-price lunch status. These positive results indicate that participation in Tier 2 level of reading interventions in this RtI model and reading outcomes are positively related and improvement in reading outcomes was most likely due to the RtI Tier 2 reading intervention. The results support the theory that students who are correctly placed and participate in RtI reading interventions at the Tier 2 level have the opportunity to improve in reading, thus narrowing the achievement gap for students with difficulties in reading. All students deserve the chance to read with fluency and understanding.

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APPENDIX A

IRB APPROVAL FORM

CALIFORNIA STATE UNIVERSITY, FULLERTON

Office of Research Development
P.O. Box 6850 or 800 N. State College Blvd., MH 103, Fullerton, CA 92831 / T 657-278-7640 / F 657-278-7238

APPROVAL NOTICE

From the Institutional Review Board
California State University Fullerton

Date: **November 19, 2013**

From: Matt Englar-Carlson, PhD, Chairperson MEC
CSUF Institutional Review Board

To: **Debra Silverman**
Department: Educational Leadership, CP-520

Re: Use of Human Subjects in Research Project entitled:
Response to Intervention: Is it Effective in Improving Reading Outcomes?

The forms you submitted to this office regarding the use of human subjects in the above-referenced proposal have been reviewed by the Regulatory Compliance Coordinator and the Chair of the California State University Fullerton, Institutional Review Board ("CSUF IRB"). Your proposal is determined to be exempt per 45 CFR § 46.101(b)(4).

The CSUF IRB has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval notice does not replace any departmental or additional approvals which may be required.

If the above-referenced project has not been completed by **November 18, 2014** you must request renewed approval for continuation of the proposal.

It is of utmost importance that you strictly adhere to the guidelines for human participation and that you follow the plan/methodology/procedures described in your research proposal. Any change in protocol or consent form procedure requires resubmission to the CSUF IRB for approval prior to implementation. Additionally, the principal investigator must promptly report, in writing, any unanticipated or adverse events causing risks to research participants or others.

Please be advised that if you are seeking external funding for this proposal, the above-referenced title should match exactly with the title submitted to the funding sponsor. Any change in project title should be submitted to the CSUF IRB prior to implementation.

By copy of this notice, the chairman of your department (and/or co-investigator) is reminded that s/he is responsible for being informed concerning research projects involving human participants in the department, and should review all protocols of such investigations as often as needed to ensure that the project is being conducted in compliance with our institutional policies and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protections.
The Assurance Number is FWA00015384.

Cc: Dr. Louise Adler
Application No. HSR-13-0471

APPENDIX B

DISTRICT APPROVAL FORM

Placentia-Yorba Linda Unified School District

1301 E. Orangethorpe Avenue, Placentia, California 92870
Telephone (714) 986-7000 Fax (714) 524-3034

Doug Domene, Ed.D
Superintendent

Board of Education
Carrie Buck
Judi Carmona
Carol Downey
Karin Freeman
Eric Padget

October 30, 2013

Institutional Review Board (IRB)
California State University, Fullerton
Office of Grants and Contracts
PO Box 6850
Fullerton, CA 92834-6850

RE: A Multi-Level Study of the Effectiveness of A Response to Intervention Model

To Whom It May Concern:

This letter is to confirm that I have reviewed the university dissertation work of Debra E. Silverman and her study, A Multi-Level Study of the Effectiveness of A Response to Intervention (RtI) Model. I find her work to be complete and follow procedures of confidentiality and anonymity of students as the data is collected. Mrs. Silverman has my full support and the permission of the Placentia-Yorba Linda Unified School District (PYLUSD) to conduct her research here using data from DIBELS Next Reading assessments used in our district.

In an effort to increase reading scores and student achievement, PYLUSD implemented an RtI model to provide structured, consistent and intense interventions for students who struggle with the reading process. Research regarding the effectiveness of the RtI model will benefit students, educators and the community in making future decisions in how to implement the model. We believe in data driven decisions and results from this research will add to the literature that is used to drive instructional decisions.

If you have any questions or concerns, please feel free to contact me at any time. I look forward to reviewing and collaborating about the results of A Multi-Level Study of the Effectiveness of A Response to Intervention Model.

Respectfully,

Candy Plahy

Candy Plahy
Assistant Superintendent of Educational Services
Placentia-Yorba Linda Unified School District