A QUANTITATIVE CAUSAL-COMPARATIVE STUDY OF READING INTERVENTION PROGRAMS FOR ELEMENTARY STUDENTS

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by
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ABSTRACT

It has been well-documented that an educational gap in literacy skills exists among children when they begin school. Some students are able to make progress without support beyond regular classroom instruction, while other students require intensive intervention to remediate literacy skills in hopes of becoming proficient readers. The popularity of reading intervention programs has increased along with the increase in accountability measures. The efficacy of intervention programs is often questioned as the results within schools do not often match the research produced by the intervention company. The main purpose of this study was to examine the effectiveness of the reading intervention programs provided at the participating elementary school. A number of students were not meeting grade level reading expectations and required additional support through a reading intervention. This quantitative research study was designed to explore the effectiveness of the interventions as well as the changes in self-efficacy as students develop reading skills in the intervention programs. As a result, this project will assist school leaders in making decisions about implementation of reading interventions and make recommendations based on the interventions. The research will help the participating elementary school make decisions about intervention programming, and it will add to the growing body of literature centered on improving literacy skills in elementary-aged students. Additionally, the research provides a better understanding of students' self-perceptions as readers, and the effects of participating in the reading intervention programs. The results of the study create an increased focus on reading interventions and assist in fostering a supportive environment.

DEDICATION

This work is dedicated to the many people who have provided me with the support, advice, and encouragement throughout this project. Thank you to the hardest working children I have ever met at the participating elementary school and school district. Thank you to the staff, parents, and community, without whom this project is quite literally, not possible. I am especially grateful to Christine Rodgers and Alexis Neri who selflessly assisted their time and effort, which is not surprising as they are two of the most selfless and kind-hearted people I know.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: THE PROBLEM

Introduction

The United States was the first country to embrace a free and public educational system for all children; however, "historically those children have been guaranteed only the right to attend school rather than the right to learn" (DuFour, Dufour, Eaker, & Karhanek, 2004, p. 15). New measures of accountability over the last 15 years have required schools to take ample steps towards ensuring students are learning a rigorous curriculum and attaining high standards. Effective schools attempt to ensure that all students master skills and acquire knowledge, and provide interventions and remediation when students' skills are not proficient.

Reading is a critical element for school success. It is pervasive across all elements of the curriculum. Developing reading skills at an early age assists children with the development of better communication skills, enhanced concentration, basic speech and language skills, as well as an increased likelihood of overall academic success. According to the National Center for Education Statistics (NCES), children who were read to at home are at a substantially greater advantage of success when they enter school. The NCES reports that students who were read to more frequently were more likely to count to 20 or higher, write their own names, and display the ability to read or pretend to read (NEA, 2016, p.1).

Early literacy skills are taught in elementary schools; however, students who do not learn basic literacy skills prior to starting kindergarten are at a disadvantage due to the increasing expectations in schools. Children, especially from low socioeconomic status (SES), often begin school at a disadvantage compared to their more financially-stable peers due to less exposure to literacy. Chin, Hutchinson, Reed, and Xu (2014) outline the challenges children from low-

income families face acquiring language skills; students from low SES households typically develop language at a slower rate and exhibit delayed phonemic awareness, which places them at risk for reading difficulties when starting school.

The National Education Association suggests repeated exposure and practice as necessary components to becoming successful readers. "Having kids read a lot is one of the crucial components of becoming a good reader. Young readers need to become practiced at recognizing letters and sounds" (2016, p. 2). One way to assure exposure to reading materials is through dedicated practice through the support of reading intervention programs. Literacy intervention programs are designed to be supplemental programs that enhance the curriculum, or prevent and remediate skill deficits for students who are not meeting grade level expectations. Intervention programs can vary in intensity based on skill deficits with the intent to provide more time and instruction to the students with the greatest skill deficits.

It is critical to address reading skill deficits early. "Children who are not reading proficiently by 3rd grade are widely seen as being in academic crisis" (Samuels, 2015, p. 24). Academic crisis is impactful to children outside of school. Students who do not receive the necessary supports early in life are at risk for failure that extends beyond the classroom. Students who are not reading proficiently early in elementary schools require effective interventions in order to be academically successful. Deficits in reading skills impact all other subject areas, as literacy skills have become a major component across the school setting as students advance through grade levels. Struggling with reading skills can also impact self-efficacy, peer relations, and behaviors as students continue to struggle academically in upper elementary grades and middle school years. According to Samuels, without effective intervention, "children who read significantly below grade level by 3rd grade continue to struggle in school and eventually face a

much higher likelihood of dropping out altogether" (p. 24). The heightened awareness of the impact on reading difficulties has created an increased focus on reading interventions. Students who are reading below grade level are often provided a variety of services which include students working one-on-one or in group instruction with highly trained reading specialists, providing supplemental reading support outside of the classroom, or even remedial reading programs that replace the instruction taking place in the classroom for students requiring the most intensive levels of support.

As students get older and advance through grade levels in school, it becomes easier to identify students who are struggling readers as the achievement gap increases. More assessment options are available to identify struggling readers. Additionally, the accuracy of assessing these skills increases as educators are more likely to identify specific skill deficits. While it is easier to identify reading needs as students get older, it becomes more challenging to close the achievement gap. Students who are not reading at a proficient level are typically given reading interventions or placed in remedial reading courses. Teachers working in isolated classrooms are not able to adequately provide appropriate differentiation for some students. Strategies to help all students learn "will require the cooperation of the school as a whole" (DuFour, DuFour, Eaker, Karhanek, 2004, p. 35). Reading intervention programs are intended to provide targeted instruction to increase students' reading skills and close the achievement gap between underperforming students and proficient students. In most cases, this requires supplemental or additional time, teacher expertise in literacy, and a setting separate from the regular education classroom.

Reading intervention levels are varied. Classroom instruction can be differentiated within the classroom by making accommodations to lessons, activities, and assessments in order to meet

the needs of students reading at different levels. Students who have more significant skill deficits in reading require more support than can be offered in a regular education classroom with 20-30 students in the classroom. Many schools have adopted a three-tiered model of support known as *Response to Intervention* (RTI). Tier 1 is a universal model applied for all students in the general education curriculum. "In Tier 1 the standard intervention practices, or curriculum, are utilized in a somewhat uniform manner across all children in the school" (Burns & Riley-Tillman, 2009, p. 6). This level of intervention is reasonable for any classroom teacher and encompasses the general population of students.

When students continue to struggle despite classroom-based interventions, they may be moved to Tier 2 in the RTI model. In this tier, students receive more rigorous interventions than the classroom-based interventions. The intervention is applied more systematically, and progress is closely monitored (p. 6). The frequency and intensity of the intervention may vary; however, this level of intervention is often delivered outside of the classroom in a small group setting in order to remediate learning gaps and skill deficits. Tier 2 interventions may be delivered as a supplement to the curriculum or as a replacement to part of the curriculum as long as the same classroom standards are being addressed. Students receiving Tier 2 interventions for reading are not reading on grade level as measured by standardized and/or classroom assessments. Students in this tier are reading below grade level by one year or less. The supplemental instruction is implemented in an effort for students to make growth and move students back to Tier 1.

Students who are not responding to interventions in Tiers 1 and 2, may move to Tier 3 in the RTI model. "In Tier 3, thoroughly understanding a child's academic or social behavior problems becomes more important as assessment and intervention efforts attempt to identify the causal variables or functional relationship between the instructional setting and student learning"

(Burns & Riley-Tillman, 2009, pp.6-7). Students in Tier 3 receive the most intense level of intervention, which requires replacement or altering of the curriculum. Similar to Tier 2, students receive reading interventions in a small group or one-on-one setting from a teacher with an expertise in literacy or through a computer-based intervention program. Students receiving Tier 3 interventions for reading are more than one year behind grade level. Reading significantly below grade level requires more frequent and intense instruction through daily interventions, which is provided at the Tier 3 level.

Reading intervention programs are intended to improve reading skills, but the benefits of improving reading skills impacts more than just increased reading achievement. Poor reading achievement has been associated with a low sense of self-efficacy. Bandura (1996) found that self-efficacy influences academic achievement, behavior, delinquency, and aggression (as cited in Johnson-Reid & Lee, 2016). "Empirical research has successfully identified the predictive role of self-efficacy on various domains of academic achievement" (p. 80). Increasing reading achievement may increase efficacious beliefs and decrease the likelihood of behavioral problems and stress in students at risk of reading failure.

This study examined the reading progress of students in grades two through five (ages seven through eleven) at Sterling Elementary School, located in the suburbs of a large urban center in the Northeastern section of the county, throughout the 2016-2017 school-year. This study includes analysis and evaluation of students' reading progress as they participated in various supplemental and replacement reading interventions, as well as students who did not receive a reading intervention program. Additionally, this study examined the difference in self-efficacy of readers who participated in reading intervention programs with students who received only the core curriculum and did not participate in reading intervention programs.

This research project addressed and assessed the relationship between the reading levels of all students before and after participating in the intervention programs; compared the effectiveness of the programs by measuring the increase in reading growth; compared the reading growth of students who participated in the interventions with the growth of students who did not receive additional support through the intervention programs; analyzed student growth by RTI tiers; analyzed reading growth by grade level, gender and socioeconomic status; and, analyzed and compared students' self-perceptions as readers. The children were enrolled in specific intervention programs based on the initial reading levels and received reading interventions that varied in instructional components, resources, time, and frequency.

Definition of the Problem

Some of the students at the participating elementary school were not meeting the grade level expectations set forth by the school district. The following data reflect the situation at Sterling Elementary School: approximately 16% of the students in grades three through five did not achieve a proficient score on the Pennsylvania System of School Assessment (PSSA) in the 2015-2016 school year; 33% of students in grades two through five scored below the basic reading levels expectations according to the Northwest Evaluation Association Measure of Academic Progress (MAP) reading assessments; and, 30% of students were not reading at a proficient level by the end of the 2015-2016 school year according to the district expectations using leveled texts from the Fountas & Pinnell Benchmark Assessment System (BAS). After the first trimester of the 2016-2017 school year, teachers reported 34% of students in grades two through five were not proficient in overall language arts achievement.

The Pennsylvania Department of Education reveals in 2015 that 38% of Pennsylvania students who were assessed on the third grade PSSA were not proficient readers. In 2016 that number increased to 39.1% of third grade students in Pennsylvania who did not score at a proficient reading level on the state assessment, which totals nearly 48,700 students (PSSA Results, n.d.).

Students who have difficulty reading early in school are more likely to continue to experience reading struggles later in school, which affects all academic areas especially in older grades. Struggling with reading can affect career and life trajectories. In a study completed by Donald J. Hernandez, a professor at the City University of New York, 16 % of students in the study who were born between 1979 and 1989 did not earn a diploma by the age of 19; the students who "struggled with reading in early-elementary school made up 88% of those who did not receive a diploma. A combination of poverty and low reading skills made a student 13 times less likely to graduate by age 19" (as cited in Samuels, 2015, pp. 24-26).

In order to increase the likelihood of student success, schools must identify students with deficits in basic literacy skills and provide remediation through intensive instruction. Some states are experiencing success through remediation and interventions. About 14,000 students did not meet the third grade reading cutoff score in Ohio in the 2012-2013 school year. "The numbers shrank after alternative tests and summer test scores came in, [suggesting] that supplemental interventions worked for 9,000 students" (Samuels, 2015, pp. 24-26). Effective reading interventions are vital to student success and closing the achievement gap.

Countless interventions exist across the country in hopes of reducing the reading gap that exists in most schools. Intervention and remediation programs have increased in popularity due

to federal compliance regulations like the No Child Left Behind (NCLB) Act and the Individuals With Disabilities Education Improvement Act (IDEA). "IDEA emphasizes the critical role of early intervening services and authorizes the use of data documenting students' responsiveness to high quality, research-based intervention in the identification of students with learning disabilities" (Denton, Kethley, Kurz, Mathes, Nimon, Shih, & Swanson, 2010, p. 394). Reading intervention programs are found in nearly every school; however, analysis of the effectiveness of the interventions is often absent.

Many schools purchase and implement multiple reading intervention programs based on the research provided by the companies, including the elementary school participating in this study; however, it has been well-documented that a gap exists between the effectiveness of reading interventions within educational research and the practice of those interventions in schools (Baker et al., 2015; Denton et al., 2010). The purpose of this research project was to examine the relationship between literacy levels before and after participation in the reading intervention programs designed for students who are identified as struggling readers; to compare the effectiveness among intervention programs; to compare the reading growth of students who participate in reading interventions with students who do not receive reading support; to compare reading growth based on Response to Intervention (RTI) tiers; measure reading growth by grade level, gender, and socioeconomic status. Additionally, student self-efficacy for all students was analyzed. The self-efficacy of the students who received intervention programs was compared with students who only participated in core curriculum classes. The data obtained through this project contribute to the current body of literature on reading intervention programs and an increased understanding of the effectiveness of the intervention programs used in the participating elementary school.

Rationale

Evidence of the Problem at the Local Level

This project was conducted because of its direct impact on elementary students' reading abilities and the potential benefit on selecting intervention programs for students as it pertains to reading and future educational endeavors. Students who are not meeting grade level expectations require more intensive instruction in order to obtain the skills and strategies to improve their reading abilities. Students who are not proficient readers receive supplemental and/or replacement reading intervention programs in hopes to increase reading success and close the reading gap. Reading is a necessary component to access curriculum and learning across all subject matters. Increasing reading abilities can positively impact other subject areas which require grade-level reading.

Teachers identified the reading levels and levels of proficiency of all students through the use of two measures. Teachers used the BAS from Fountas and Pinnell (2015). Fountas and Pinnell (2016) suggest the use of benchmark assessments for teachers because the system "provides valuable information on reading accuracy, fluency and comprehension as well as data to support a broad range of reading, writing, phonics and vocabulary instruction" (p. 7). The BAS is an evaluation system used to assess students' reading levels. The assessment evaluates students' ability to read accurately, read fluently, and comprehend the text. The school district requires the use of the BAS to measure students' levels of proficiency. Teachers use these reading levels to group students for targeted instructional practice in guided reading. Thirdly, the BAS is used as a common assessment for reporting purposes.

Classroom teachers, special education teachers, and reading specialists share the responsibilities of ensuring all students are assessed using the BAS at a minimum of three times per year- fall, winter, and spring. Professional training was provided to all teachers for fidelity in assessment practices. All teachers administering the BAS and participating in this study were provided the same administration training during a district professional development day the prior year from a Fountas and Pinnell training representative to ensure fidelity of assessment administration. Teachers new to the district who did not receive the training, are trained by the building reading specialist in a one-on-one training, and by modeling administration of the training.

Administering the BAS requires a one-on-one setting, in which students are asked to orally read an unfamiliar text, or part of an unfamiliar text, while the teacher administering the assessment records miscues, omissions, additions, and errors. Teachers analyze miscues in order to determine how well the reader can apply reading strategies and self-correct to derive meaning. Students are then asked comprehension questions to measure their level of understanding. Teachers score students' answers based on accuracy and comprehension of the text. The BAS provides assistance for teachers by including sample responses to assess comprehension. Teachers use the measurement tools to measure reading ability which consists of "their knowledge and experience of the text topic and content, their knowledge of and experience of print conventions, letter, sounds and words, and their knowledge and ability to use semantic, syntactic, visual, and graphophonic information" (Davis, 2013, p. 4). Teachers consider the miscue analysis and responses to the comprehension questions to determine the students' reading levels. "In general, if a child reads a text with at least 90-95 percent accuracy, and with fluency and comprehension, [a teacher would] consider the text to be at a child's independent reading

level" (Collins, 2004, p.95). A child who reads with 95-100 percent accuracy but struggles with comprehension questions is not reading at his or her independent reading level. Depending on the level of comprehension, the text would be noted as a level that is "Instructional" or "Hard." Students struggling with reading accuracy or fluency within a text are likely reading a text that is too difficult, and the text would not be considered appropriate to read without support, or at the student's "Independent" level.

The participating school district uses the Fountas and Pinnell leveling system, which consists of 26 levels; it is a lettered system of A-Z. Texts are assigned lettered-levels based on their length and complexity. The expectations and reading levels increase with each grade level. The participating elementary school requires a benchmark level of M by the end of grade two; P is required by the end of grade three; S is required by the end of grade four; a level of V is required by the end of the fifth grade year.

After a teacher administers the BAS and obtains a reading level, the data are recorded in a longitudinal student folder that contains measures of a student's progress over time. Data are also recorded in the district's digital data base once each trimester. These data are reviewed at the beginning of each school year, and students' progress is monitored throughout the year. Data continue to be collected to determine if accommodations or modifications need to be made to the child's programming. Students who are reading significantly below grade level expectations receive the most intensive level of support through the most intensive intervention. Teachers and administration collaborate to determine the level of intervention needed for each individual student.

The participating elementary school provides 60 minutes of *specials*. Specials are scheduled in two consecutive 30-minute blocks of time. Specials are the subjects Art, Physical Education, Music, Library, Math Workshop, and Reading Workshop. Students who do not receive interventions attend two specials per day. Students who receive interventions during specials receive the instruction during one or more of the 30-minute blocks of time allocated for them. Instruction of intervention programs delivered during this time is referred to as *supplemental instruction*. The school schedule allocates 90 minutes of literacy instruction in the regular education classroom. *Replacement Instruction* refers to interventions delivered to students during the same time classroom literacy instruction is being delivered to students who are not receiving interventions.

The design of the intervention involves a choice of eight RTI levels: (a) RTI2-Teacher-Created Intervention- students receive supplementary instruction with no loss of instructional time. Students receive instruction from a reading specialist without the fidelity of an intervention program. Lessons are teacher-created based on students' needs. Supplementary support is given during specials four times per cycle; (b) RTI2-LLI Supplemental- students receive supplementary instruction through the Leveled Literacy Intervention (LLI) program with no loss of time in the regular education classroom; supplementary support is given during *specials* four times per cycle; (c) RTI2-Read Naturally- students receive supplementary instruction through the Read Naturally (RN) program with no loss of time in the regular education classroom; supplementary support is given through a computer-based program during *specials* four times per cycle; (d) RTI2-LLI Supplemental and Replacement- students with Individualized Education Plans (IEP's) receive the LLI program in a small classroom environment for 30 minutes; supplementary support is given during *specials* three times per week; (e) RTI3-LLI Replacement

and Supplemental- students with IEP's receive 60-minutes of replacement reading instruction through the LLI program in a small classroom environment for one hour; supplementary support is given during specials three times per cycle; (f) RTI3-iReady- students receive 45 minutes of replacement instruction through the iReady platform daily; supplementary support is given to students three times per cycle. (g) RTI3-Read 180- students with IEP's receive 60 minutes of replacement reading instruction, through the Read 180 program; supplementary support is given during specials three times per week; (h) RTI3-LLI and FF- students with or without IEP's receive 30 minutes of replacement instruction with the LLI program and 30 minutes of supplementary instruction daily through the Fast ForWord (FF) program. The FF program is designed to address phonological needs. A collaborative effort by the principal, classroom teacher, special education teacher, and reading specialist determine if a student will receive an intervention and what the model will be based on student data.

Table 1.1
Interventions and Frequency

Group	Tier	Intervention	Daily Supplemental Instruction (in minutes)*	Daily Replacement Instruction (in minutes)*
A	2	Teacher-Created	20	0
B	2	LLI	20	0
C	2	RN	20	0
D	2	LLI	15	30
E	3	LLI	15	60
F	3	iReady	15	45
G	3	Read 180	15	60
H	3	LLI & FF	30	30
*Averaged based on 30-minute sessions during a 6-day cycle				

All students receive instruction in reading which includes *guided reading*. "Guided reading is a context in which a teacher supports each reader's development of effective strategies for processing novel texts at increasingly challenging levels of difficulty" (Fountas & Pinnell, 1996, p. 2). Guided reading is context-dependent. The frequency in which teachers meet with students depends on the classroom and needs of the students. Students reading at advanced reading levels receive guided reading 2-4 times per week from the classroom teacher based on schedules, class size, need, etc. Proficient and struggling readers receive guided reading more frequently from the classroom teacher. Students who are not meeting grade level expectations receive guided reading daily as an intervention. A 30-minute lesson is delivered to these students by the classroom teacher using a variety of resources unless the student has an IEP for a reading disability. Students with IEP's receive a 30-minute LLI lesson by the special education teacher, which is the replacement instruction for Group D, the Tier 2 group using the LLI program as supplemental and replacement instruction. The lesson is delivered in a small group and targets students' individual reading needs, and focuses on the development of reading strategies, fluency, and comprehension. Teachers delivering the intervention are continually monitoring students' progress and assessing their skills.

Evidence of the Problem from Professional Literature

Students who have difficulty reading often experience difficulties in subjects other than reading. They are also absent from school more frequently. There is a correlation between struggling readers and chronic absenteeism (Bruner, Chang, and Discher, 2011). "One of the great values of focusing upon chronic absenteeism is that it represents an early warning sign for subsequent school problems" (p. 5). Absenteeism equates to a loss of instructional time that is spent developing literacy skills. The gap between proficient readers and non-proficient readers

only increases after third grade. According to the Alliance for Excellent Education (2003), 8.7 million students in grades four through eight are "below-average readers" (as cited in Miller, 2009, p. 1).

There is pressure put on educators and schools to show increased student performance in reading ability. The National Center of Education Statistics published data that suggest that expectations are not being met. As students get older, the achievement gap has been increasing over time. "While the 2015 average 4th-grade reading score was not measurably different from the 2013 score, the average 8th-grade score was lower in 2015 than in 2013" based on data from the National Assessment of Educational Progress (Kena et al., 2016, p.142). This highlights the importance for students to be strong readers in elementary school in order to increase their chances for success in later years.

Schools have been challenged to increase the percentage of students who are proficient readers since NCLB was signed into law in January of 2002. Reading is at the core of the NCLB Act. "A key component of the act has been Reading First, an initiative that has required the implementation of scientific, research-based instruction by highly qualified teachers using materials with proven effectiveness" (Hunter, 2016, p. 2). Allington, Block, Morrow, Pressley, and Wharton-McDonald (2001) argue that the "literacy demands of modern society have significantly increased at a dizzying pace as the core economic activity has shifted from manufacturing to information processing" (p. 26). Teachers are charged with ensuring students can not only decode words, but also develop deep understanding of the text. The demand and need for effective reading instruction continues to increase as expectations of students increase, as well as accountability measures.

Absent effective instruction and intervention leads to students struggling in reading, which impacts self-efficacy, cognitive interest, and success in all academic subjects. In order to address the problem, "states have implemented a variety of policies intended to identify reading problems before they become entrenched, and then steer children into instruction that will change their trajectory" (Samuels, 2015, pp. 24-26). It is crucial for students to receive targeted interventions to address the needs of struggling readers in order to be successful later in academia as well as life. The Alliance for Excellent Education (2009) argues that "intensive intervention to address the needs of struggling readers is an essential element of preparing all students to meet the increased demands of college, the workplace and beyond" (as cited in Scholastic, 2016, p. 2).

Teachers in the participating elementary school are highly qualified with experience levels ranging from 2-25 years, and have been rated as satisfactory teachers each year. They provide quality instruction; however, not all students are meeting grade level expectations or meeting levels of anticipated growth. "Although most children learn to read during early elementary school through a variety of effective reading instructional programs delivered by the classroom teacher, some children do not seem to profit from regular classroom instruction in reading" (Amendum, Burchinal, Gallagher, Ginsberg, Kainz, Rose, & Vernon-Faegans, 2010, p. 183). A number of interventions are used as a way to improve growth and proficiency when the interventions within the classroom are ineffective.

Reading interventions at an early age are critical to successfully remediate reading skills. Denton, Fletcher, Anthony, and Francis (2006) suggest that, "interventions in a number of contexts have shown that children who are at risk for not meeting grade level

expectations benefit from more explicit and more intensive reading instruction" (as cited in Amendum et al., 2010, p. 184).

When reading instruction is ineffective or students do not meet anticipated levels of growth, teachers and administrators implement interventions through the RTI model. The most effective instruction to prevent reading failure in young children with reading difficulties includes explicit decoding and word recognition and the ability to develop word meaning; early intervention and prevention of creating a reading gap in the early elementary years; and small group or one-on-one intensive instruction (Foorman & Moats, as cited in Amendum et al., 2010).

Definitions

Benchmark Assessment- A highly reliable text that is read with 90-95% accuracy and comprehended by a large majority of children who demonstrate similar behaviors at a similar point in time (Fountas & Pinnell, 1996, p. 114)

Comprehension- A recursive process in which the reader may construct new understanding cumulatively while reading or even later when reflecting on the text or connecting it to other texts (Fountas & Pinnell, 1996, p. 78)

Decoding- the ability to read words by isolating attention on letters and sounds (Allington et al., 2001, p. 16)

Efficacy- one's own judgement of his or her ability to perform an activity, and the effect one's perception has on the activity and the future conduct on the activity (Henk & Melnick, 1995, p. 471).

Fluency- the pace of reading, including reflection of the syntactic patterns and ability to rapidly access meaning and apply it to the text to ensure the language makes sense (Fountas & Pinnell, 1996)

Guided Reading- a context in which a teacher supports each reader's development of effective strategies for processing novel texts at increasingly challenging levels of difficulty. The teacher works with a small group of children who are reading at a similar level or have similar needs (Fountas & Pinnell, 1996, p. 2).

Independent - Students working at levels in which they do not require support. If teachers are providing additional support, it is just enough support so that students can complete the task on their own (Allington et al., 2001, p. 68).

Intervention- A modification of the environment, curriculum, or instruction made for the purpose of altering behavior in a "prespecified" way, which can be applied to the whole group, small group, or individual level (Burns & Riley-Tillman, 2009, p.2).

Phonics- the relationship between the sounds of language and the graphical representation of the letters (Fountas & Pinnell, 1996, p.164)

Proficiency- A consistent level of performance that meets the current grade level expectations or standards (O'Connor, 2009, p. 140).

Reading Level- The level in which a student is able to read accurately, fluently, and comprehend the material. The terms used to differentiate reading levels for students is *Independent, Instructional,* or *Hard*. Students reading at an independent level are able to read and comprehend material on their own. Instructional reading levels are more challenging for the student, but they

are able to read and comprehend the text within the context of the teacher providing the instruction. When texts are too challenging for students, and are more than one letter-level removed from the students' independent reading levels, they are considered "Hard" (Fountas & Pinnell, 2016, pp. 2-3).

Remediate- Instruction provided with the intent to intervene in order to close learning gaps or develop skills when students do not progress at the same rate as their peers (Burns & Riley-Tillman, 2009, p. 1).

Response to Intervention (RTI)- An educational problem-solving model with the primary goal of providing the most effective instruction to each student through the efficient allocation of educational resources (Burns & Riley-Tillman, 2009, p. 3).

Supplemental- Instruction provided in addition to the regular education curriculum that takes place outside of regular classroom instructional time. Supplemental instruction occurs outside of the allotted instructional minutes allocated to each subject.

Significance

Children who enter school with little exposure or experience with language exhibit delays in letter recognition, phonological awareness, and are at greater risk for reading deficits at an early age (Chin et al., 2013). Students who struggle with literacy skills early in school are at risk of falling behind their peers, and they are at risk of never catching up to their peers. Children who come from homes of low SES appear to fall even further behind in the achievement gap as they continue in school (Amendum et al., 2010). Elementary grades are crucial years for

providing interventions to assist students in making adequate gains. Nearly 75% of students who struggle with reading by the end of third grade continue to struggle with reading by 10th grade (Miller, 2009). Poor reading skills can also lead to poor social development, a lack of confidence, behavioral problems, and poor self-efficacies. "Very capable students often fail because their efficacies are low" (Scott, 1996, p. 197). Students who perceive themselves as good readers have more positive experiences with texts that can lead to greater success in reading and greater motivation to do well in school (p. 200).

Guiding Research Questions

The current emphasis on accountability for student achievement makes the need for effectiveness of research-based interventions increasingly necessary. Several intervention programs have been purchased and implemented with some variability at the participating elementary school. Each intervention program is research-based with published data on the effectiveness of the program; however, there is no research comparing the effectiveness of the programs among each other, nor are there data comparing the effectiveness of the intervention programs on student growth to data of students who do not receive reading interventions. Thirdly, an analysis comparing reading growth based on RTI tiers has not been completed. Additionally, there are no data on student self-efficacy for students who use the intervention programs.

Overarching Research Question: What is the effectiveness of the intervention programs on student reading growth used at the participating elementary school?

Guiding Research Questions:

- Which intervention programs produce the greatest results in terms of increased reading ability?
- Are there differences in reading growth based on socioeconomic status, gender, or grade level?
- How do students perceive themselves as readers as a result of receiving additional reading support through interventions?

CHAPTER 2: REVIEW OF THE LITERATURE

Introduction

The primary purpose of this study was to evaluate the effectiveness of reading intervention programs on student reading achievement. The review of literature is compiled from published texts centered on reading, research-based literature provided by the intervention programs used at the participating elementary schools, published articles in scholarly journals, and searches through the Temple University Library and its databases. The key search terms were literacy, reading, intervention, effective, struggling readers, self-efficacy, literacy skills and developing readers.

Relevance

Whitehurst (2001) reports that children who struggle with reading are not only at risk for school failure but are also more likely to struggle with social and emotional issues, delinquency, and drug abuse (as cited in Dennis & Horn, 2011, p.30). Addressing literacy development in young children and emergent learners is necessary prior to students experiencing patterns of failures that lead to frustration and disinterest in school. Development of literacy skills must be addressed with intentionality and specificity. Literacy development, including parents reading to children, are beneficial to all children "including children with disabilities and those from culturally and linguistically diverse backgrounds" (Dennis & Horn, 2011, p. 31). Language, vocabulary development, and listening comprehension are products of book conversations between parents and children.

Children have varied experiences culturally, socioeconomically, and linguistically prior to formal education that cause students to start school with a range of literacy skills; however, all

children can experience growth and benefits from experiences created by parents "talking to children early in life, reading to them early in life, and interacting socially with children around language and literacy activities creates the milieu in which plasticity during the critical period can be maximized for all children" (Kuhl, 2011, p. 138).

Predicting and measuring success begin at infancy. In addition to cognitive ability and development, early literacy skills are shaped by experiences, culture, parenting, and socializing. Gottfried, Schlackman, Gottfried, and Boutin-Martinez (2015) argue that the amount of time spent reading to young children is an independent predictor of reading achievement, motivation and level of education (as cited in Hamilton et al., 2016). "Children's learning trajectories regarding language are influenced by their experiences well before the start of school" (Kuhl, 2011, p. 128). The goal of educators is to alter the learning trajectories of students who lack learning and literacy skills through reading interventions early in schooling.

The achievement gap between at-risk students and proficient students begins prior to children starting school. The National Institute for Literacy (2009) examined the learning gap that exists among children from birth through age 5. The following research questions were addressed in that study:

> What are the skills and abilities of young children (age birth through five years or kindergarten) that predict later reading, writing, or spelling outcomes?; Which programs, interventions, and other instructional approaches or procedures have contributed to or inhibited gains in children's skills and abilities that are linked to later outcomes in reading, writing, or spelling?; What environments and settings have contributed to or inhibited gains in children's skills and abilities that are linked to later outcomes in reading, writing, or spelling?; and What child characteristics have contributed to or inhibited gains in children's skills and abilities that are linked to later outcomes in reading, writing, or spelling? (p. 2)

The results of the study suggest a correlation in children's literacy skills from their early years, prior to beginning school, to conventional literacy skills during school-aged years. Conventional skills like alphabet knowledge, phonological awareness, rapid automatic naming of letters or digits, rapid automatic naming of objects or colors, writing or writing name, and phonological memory were examined as they are important foundational skills (National Institute for Literacy, 2009, p. 3).

Students who begin kindergarten without literacy skills are starting with a disadvantage compared to students who enter kindergarten with emergent literacy skills. Mol and Bus (2011) suggest "children with better language and literacy skills are more likely to read independently" (as cited in Hamilton, et al., 2016, p. 403). Students beginning school with well-developed literacy skills have more opportunities to develop more and new literacy skills while students without these skills are spending time building foundational literacy skills. Additionally, the ability to read independently provides students with the advantage of having more opportunities to attempt tasks and experience challenges independently, opposed to those who must rely on adults to read directions, texts, objectives, etc. Children who begin school and have emergent competency in literacy skills, which include letter knowledge, print awareness, etc., demonstrate higher levels of reading achievement in their elementary years than children who begin school lacking emergent literacy skills (Dennis & Horn, 2011, p. 30).

Students with reading deficits early in elementary years can have compound negative effects. Students in primary grades typically make significant reading growth as they are immersed in literacy. "While first and second grade growth curves were characterized by acceleration from September to April, third graders demonstrated trends of deceleration (Crowe, McDonald Connor, & Petscher, 2009, p. 204). It is critical for students to make reading growth

in the primary years. The gap between students with reading deficits and proficient students will increase as most students experience acceleration in reading skills in the early years.

Educational inequality has an extensive history in the United States. Monitoring the achievement gap and academic growth of low-achieving students in comparison with proficient students is used as a measure of the quality of instruction in schools. Darlington-Hammond (2013) argues that the achievement gap can be monitored through traditional grading practices and standardized test scores. Interventions increase the opportunities for educators to closely monitor reading growth of small groups of students with the intentions of closing the reading gap by making adjustments based on assessment data. A component of reading intervention programs includes the monitoring of students' progress and making necessary program adjustments to ensure growth for all students. Increasing reading growth through interventions for struggling readers increases the chances of closing the achievement gap, and it increases opportunities for more students to master grade-level curriculum.

In order for schools to ensure all students master grade-level curriculum and meet standards, schools must be "vigilant in its effort to assess each student's learning on a timely, ongoing basis" (DuFour, DuFour, Eaker, & Karhanek, 2004, p. 23). Procedures must be in place to ensure students are learning. Interventions are required when students are not meeting grade-level expectations. Interventions are in place to provide additional support for students who need support beyond what is capable in the regular education classroom. "Schools must create a systematic process to provide additional time and support for students who experience initial difficulty in learning" (p. 168).

Douglas (2013) defines achievement as students' proficiency levels on standards-based assessments. The levels of achievement bands are typically reported as below basic, basic, proficient, or advanced. Achievement is reported after the completion of summative assessments and represent student understanding of a skill or skills at the time the assessment is administered. When achievement is reported, the amount of growth and progress is not considered. Achievement compares students' performances to a standard or grade level expectation.

Academic growth is different than academic achievement. Academic growth is a longitudinal measurement of student performance over time (Hixson, 2010). Growth measurements are used to determine the amount of academic progress students made over a period of time, and how the academic gains compare among students. The benefit of using data based on growth measurements is that academic progress can be measured regardless of initial academic competency. Academic growth compares individual student's performance to their own prior performance. Measuring growth provides an opportunity to evaluate the quality of instruction and the strengths and needs of all students from the lowest achieving students to the highest achieving students.

Measures of achievement and growth can be monitored for individual students. A variety of assessments can be used to determine student progress. Student data are collected and analyzed from standardized assessments to determine student progress. Achievement and growth are commonly reported on current standardized assessments. Measuring and analyzing achievement and growth provide guidance to schools about programming in addition to students' strengths and needs. Castellano and Ho (2013) describe academic growth as "a collection of definitions, calculations, or rules that summarizes student performance over two or more time

points and supports interpretations about students, their classrooms, their educators, or their schools" (p. 16).

Analyzing student progress based on academic growth can be accomplished through a variety of measures: gain score; trajectory; categorical; residual gain; projection; student growth percentile; and multivariate (Castellano & Ho, 2013). Student growth can be measured by analyzing student performance on standardized assessments over two or more points in time. The data can be used to analyze the growth of groups of students, including subgroups of students who receive program interventions. There are three fundamental interpretations that growth metrics support:

> *Growth Description*: How much growth? A growth metric may support inferences about the absolute or relative magnitude of growth for an individual or group.
> *Growth Prediction*: Growth to where? A growth metric may support inferences about the future status of a student or group given current and past achievement.
> *Value-added*: What caused growth? A growth metric may support inferences about the causes of growth by associating growth with particular educators (e.g., teachers or principals) and schools. (p. 19)

Growth and progress are monitored through standardized assessments. These assessments can also be used as a universal screening assessment. Children who are in need of interventions in order to make academic advancements and close the achievement gap are identified through standardized assessments that are used as universal screeners. Salinger (2016) explains that a universal screening assessment can be used as the initial part of the educational process to help educators identify students requiring additional support beyond what is typical of a classroom teacher. Identifying students in need of interventions can be done through the administration of standardized assessments, rating scales, or observations and data collection to compare achievement of all students in a school or grade level. Schools like the participating elementary

school that utilize the RTI framework use screening tools to identify students who are struggling academically, or who may be at-risk for learning or other disabilities. Students who are identified through this process can be provided interventions to increase the likelihood of academic success.

Conceptual Framework

Piaget's Theory of Cognitive Development focuses on the way children's thinking develops over time. Piaget argued that learning did not happen over time; rather, children's schemas build as they learn from external factors such as direct instruction and life experiences, moving from the concrete to the abstract. Children learn letters and then letter-sound correspondence. Children learn to put letters together to make words, and words together to make sentences. Students learn to read texts and apply comprehension strategies like making predictions, inferences, and drawing conclusions. Children are taught this through explicit, direct instruction. As students develop these cognitive skills, they learn to apply these skills to other texts as well as during authentic reading and abstract situations.

As new information is acquired in children, they learn more abstract concepts and how to apply these concepts to other texts. Piaget would argue that teachers must be aware of students' reading levels and instruct them at a targeted instructional reading level in order to build their schemas. This can be done effectively through remediation in a small group setting for struggling readers.

Teachers must evaluate the reading levels of their students prior to planning, delivering instruction or applying interventions (Schunk, 2012). According to Piaget, concepts such as

literacy development are not inborn; rather, students must acquire and develop them through experiences, which can be provided through direct instruction. The reading strategies taught to students are modeled, practiced, and applied to texts.

Cognitive theory has four main implications for instruction that teachers must adhere to in order for students to learn. Teachers must (a) know the cognitive levels of their students, and understand that not all students in a class function at the same level; (b) the learning must be active so that the students are engaged in the instruction; (c) the level of instruction must allow for students to assimilate new information, but not be too difficult to access the information; and (d) students must have opportunities to learn from others who have different points of view (pp. 239-240). Theories of cognitive development are often applied when teaching reading in a small group, which is common for reading interventions. Teachers explicitly model expectations, reading behaviors, and metacognition so that students can develop and apply the new information. Teachers use an approach referred to as the gradual-release model, or the "I do, we do, you do" model in which students receive scaffolding to gradually release the responsibility of learning. The teacher models the learning or reading strategy, then allows students to work together to practice the skill before applying it on their own (Lambert, Marchan-Martella, & Martella, 2015).

Comprehending text slightly above a student's reading level is a complex mental task. Readers must apply strategies taught, apply their background knowledge, and create a meaningful representation in order to be successful. Current studies of reading comprehension emphasize the use of strategies and metacognition for reading development (Science International, 2015). The cognitive learning development requires background knowledge,

repetition, the ability to construct and deconstruct language, and make inferences, which can be remediated through reading intervention programs.

Early detection of reading deficits and interventions in schools to address those deficits can help close the achievement gap between proficient readers and non-proficient readers. Teachers can support literacy development using specific strategies, accommodations and modification (Dennis & Horn, 2011).

Early learning is complex and multilayered. Research has shown evidence of positive outcomes and growth when interventions are applied to students. "The National Reading Council proposed that many reading difficulties could be prevented when young children receive effective instruction" (Denton et al., 2010, p. 395). Reading intervention programs provide students with an opportunity to work with expert teachers in a small group or one-on-one setting. The absence of intervention will likely maintain or increase the gap between proficient and non-proficient readers. Interventions provide support from teachers or programs in a way that allows them to closely monitor students' progress. A study by Mansett-Williamson and Nelson (2005) showed positive results from scripted intervention programs when they were provided to students in grades 4 through 8. "Results showed that participants can make gains in decoding, fluency, and comprehension when they are provided with intensive reading instruction and direct, explicit instructional procedures" (as cited in Fountas & Pinnell, 2015, p. 9). Closely monitoring student progress, assessing reading abilities, and developing a plan of remediation is necessary to effectively implement interventions. "Ongoing monitoring of student progress is essential to ensuring that all students become proficient readers" (Hunter, 2016, p.4).

There are many interventions available to schools. Reading intervention programs can vary in cost, frequency, resources, and design. Many programs aim to target specific reading deficits through intensive instruction on a particular skill or strategy. For example, the digital software program "Fast ForWord" is designed as in intervention for students who have phonological awareness needs. The Wilson Language Company offers a number of intervention programs for specific skills; the company's "Just Words" program targets students in grades 4 through 12 who are not proficient with decoding or spelling. "Read Naturally" emphasizes fluency; however, in order to be a fluent reader, students must be able to decode words and use comprehension strategies to use context clues and read unfamiliar words. Students also answer comprehension questions from the text. The Leveled Literacy Intervention, iReady, and Read 180 are more comprehensive intervention programs that balance decoding, fluency, comprehension, and encoding.

Sterling Elementary School created a daily schedule centered on maximizing instructional time. The schedule allows for supplemental instruction through reading interventions to be delivered during non-instructional time. Students not meeting grade level reading expectations are provided reading interventions during times that their peers are going to specials (art, library, music, etc.). The schedule also allows for students who require altered curriculum or small group instruction to receive replacement instruction during the least obtrusive times during the day. For example, if students are receiving guided reading instruction in the classroom, students requiring additional reading support will receive similar small group guided reading instruction during that time with a reading specialist or a special education teacher.

The schedule allows for maximizing instructional time. Many programs have been purchased over the years, and intervention programs have not been evaluated through statistical measures. While there are a plethora of intervention programs and methods in which they are being delivered, the effectiveness of the programs have not been measured.

The participating school does not complete a program evaluation for the intervention programs, rather it accepts the research provided through the program literature provided by the companies. While the intervention programs are all research-based, their effectiveness in the schools have not truly been measured, as they are implemented in an authentic school setting. Furthermore, the efficacy of the interventions has not been considered. "If the potential of the [Response To Intervention] approach is to be realized, instructional interventions with evidence of efficacy in controlled studies must also be effective when scaled up in natural school contexts" (Denton et al, 2010, p. 395). The research on intervention programs usually take place in a vacuum outside of a school setting. Schools are dynamic by nature, and it is important to analyze intervention programs in authentic situations. This study is designed to benefit the students as they were closely monitored and assessed as they receive reading interventions in an authentic setting. The school and district will be able to make more-informed and better decisions about student placement in interventions based on the data from the study.

The overarching research question for this study is: What is the effectiveness of the intervention programs on student reading growth? This study was chosen to increase the likelihood of student success in reading by evaluating the effectiveness of the intervention programs.

Reading Intervention Programs

Several interventions are used at the participating elementary school. Interventions are selected based on students' needs. There are a variety of options available based on student data. The options vary in time and frequency, designed to meet students' needs.

The Teacher-Created (TC) intervention allows for a certified, veteran, reading specialist to use his discretion and expertise to provide instruction for an average of 20 minutes of daily supplemental instruction. The reading specialist assesses students' needs to determine the best and most appropriate way to remediate skills. He borrows materials and strategies from a variety of sources for his instruction. The reading specialist teaches students decoding and comprehension strategies, depending on the level and need of students.

The participating elementary school uses the Leveled Literacy Intervention (LLI) as a Tier 2 and a Tier 3 Intervention. LLI provides daily, intensive, small-group instruction using leveled texts and systematic lesson plans provided for teachers (Fountas & Pinnell, 2015). LLI is designed for struggling readers who are not meeting grade level expectations. Teachers provide direct instruction on reading strategies to students with similar needs. Sterling Elementary School uses this strictly as a supplemental support for one intervention level (LLI-1). The LLI-2 group receives the intervention as 15 minutes of daily supplemental support and for 30 minutes of daily replacement instruction. The LLI-3 group receives 60 minutes of daily replacement instruction in addition to the 15 minutes of daily supplemental instruction.

Read Naturally (RN) is a fast-paced, computer-based program used as a Tier 2 intervention. Students participating in the RN intervention receive an average of 20 minutes daily. The program is intended to accelerate reading skills by applying reading strategies for students to read leveled passages at an individualized pace. The program provides guidance for

students to go through progressive increases in the program. The student achieve mastery of various passages by reading along with audio of the text and then practicing the story until the student can read it fluently and with comprehension ("Read Naturally Live," n.d.).

One of the Tier 3 interventions used at the participating elementary school is the iReady program (iR). The self-paced, computer-based program uses a diagnostic assessment to tailor a program to provide specific and targeted direct instruction to students based on the results of the diagnostic assessment and the subsequent lessons. Students automatically receive online lessons and direct instruction through the program at their instructional level ("Curriculum Associates," n.d.). Students receiving the iR intervention receive 45 minutes of daily replacement instruction and an average of 15 minutes of daily supplemental instruction.

The Read 180 program is another Tier 3 intervention. Students participating in the Read 180 program receive 60 minutes of daily replacement instruction and 15 minutes of supplemental instruction on average. The Read 180 program uses a blended model of direct teacher instruction to students in a small group with an individualized component, using a computer adaptive program. Students learn close-reading strategies, complete academic vocabulary exercises, practice writing, and engage in small group discussions (Scholastic, 2016).

CHAPTER 3: METHODOLOGY

Introduction

Reading skills affect children well beyond the English or Language Arts classroom. Struggling readers who do not receive effective interventions early in school continue to struggle later in school academically, and often behaviorally. Students who are still struggling in reading by the end of third grade have a difficult transition to middle school when the workload increases, expectations for reading across all content areas increase, and social norms change from elementary school. "Their chance of becoming a disciplinary problem, failing classes, or dropping out are better than their chances of rebounding to read on grade level and graduate on time" (Miller, 2009, p.1). The more students struggle, the less likely they are to show academic growth, much less become proficient readers. Struggling readers show less growth than their proficient peers. According to a report from the National Assessment of Educational Progress, 41% of Pennsylvania students in fourth grade were reading at a proficient level in 2015, while 39% of students in eighth grade were reading at a proficient level. When the 2015 eighth graders were in fourth grade in 2011, 41% of students were reading at a proficient level (2017).

In order to increase the likelihood of academic success, the participating school utilizes intervention programs for struggling readers. Reading intervention programs in schools are in place to target individual student needs requiring more intensive instruction beyond the instruction of the general education classroom. Students who are not meeting the respective grade level expectation receive a more intensive approach to reading instruction designed to target students' needs and develop reading skills and strategies. Students' reading skills are closely monitored and assessed as part of the reading intervention programs in this research. This

study can serve as a tool to evaluate the effectiveness of the intervention on students' reading progress. Student data were collected to analyze overall reading growth, decoding ability, fluency, and comprehension in order to accurately determine the level of effectiveness of each program.

This study is designed to serve all students in the participating elementary school, particularly the students who were identified as struggling readers due to reading below grade level expectations. An additional benefit of this study is to provide detailed results of intervention programs to the teachers and administrators of the participating school to make more-informed decision making in terms of implementing instruction. It also provides information on students' self-efficacy as a result of participating in reading intervention programs.

Methodology

All students in the participating elementary school were assessed in the beginning of the year to determine reading proficiency and skills using the Measure of Academic Progress (MAP), Benchmark Assessment System (BAS) and Reader Self-Perception Scale (RSPS). The BAS determines students' instructional reading levels. District mandates require all teachers to administer both assessments to all students in grades two through five, which include an initial assessment at the beginning of the year, a mid-year assessment, and a final assessment administered at the end of the school year. The participating elementary school uses the initial data to identify students in need of reading interventions and assign them accordingly. Students are monitored and assessed over 30 weeks while the interventions are implemented.

The methodology applied in this research is a quantitative, causal-comparative, nonexperimental, or *ex post facto* research design. Causal-comparative, nonexperimental, or *ex post facto* research design, compares "groups of people who already differ on variable of interest. The preexisting factor differentiates groups and permits a meaningful comparison" (Suter, 2006, p. 468). "In nonexperimental research, the situation cannot be manipulated because the manipulation of the independent variable has already occurred" (Hoy, 2010, p. 17). Research in an educational environment ought to be studied as the events occur naturally. *Ex post facto* research is appropriate when using human subjects in real-world situations and the data are collected after uninfluenced instruction in education (Suter, 2006). This methodology is the appropriate approach for conducting research in an elementary school where experimental research on reading interventions is not allowed.

The benefit of conducting a causal-comparative, nonexperimental study is that the data are authentic, uninfluenced, previously collected, and more time can be spent analyzing data than creating it. A retrospective causal-comparative, nonexperimental study is appropriate to determine the effectiveness of multiple reading interventions by studying elementary-aged students' reading growth and comparing the effects with the control group of students not receiving the reading interventions. The sample that was used in this research was not homogeneous. Students are assigned reading interventions based on academic needs and skill deficits. The students' reading needs were identified prior to the interventions.

Research Design

Classroom teachers, special education teachers, and reading specialists administered the MAP, BAS, and Reader Self-Perception Scale (RSPS) to all students. Results of the MAP and BAS were analyzed by teachers, the reading specialists, and the principal in order to identify struggling readers. I analyzed students' self-efficacy using the RSPS. The reading assessments were used to identify the students who were not meeting grade level expectations and in need of extra support. The goal of the interventions is to increase reading proficiency by providing instruction to increase students' ability to decode, become more fluent, and develop better reading comprehension. Students identified in need of reading support were assigned varied levels of support through varied interventions based on their levels of need.

Tier 1

All students are placed in three tiers. Proficient readers are placed in Tier 1. They receive instruction in the general education setting without additional support through an intervention. Struggling readers are placed in Tier 2 and Tier 3 based on their levels of need and skill deficits. All students in the school are scheduled for 90 minutes of English-Language Arts instruction. Included in the 90 minutes of instruction is 30 minutes of guided reading. During guided reading, teachers provide instruction to small groups of students reading at the same instructional level. Guided reading in the regular education setting allows for teachers to see students 2-4 times per cycle; however, students who are identified as struggling readers receive interventions that provide targeted, supplemental and/or replacement instruction for 30 minutes daily.

Tier 2

Tier 2 interventions include a teacher-created reading intervention, which is based on knowledge of students' needs, the computer-based program Read Naturally (RN), or the Leveled

Literacy Intervention (LLI). A reading specialist delivers a Tier 2 intervention which uses the person's knowledge and expertise in reading, and applies it towards students' skill deficits. Students who are not meeting grade level expectations and are struggling with decoding and/or fluency, but do not display difficulties with comprehension, receive RN, a computer-based program that requires repeated readings to improve decoding and fluency in addition to the regular education programming in the classroom. This program requires adult support to answer comprehension questions, monitor progress and make programming adjustments. Those students are seen in addition to their classroom instruction for 30-minutes, four times per six-day cycle.

Students who struggle with comprehending grade level material, as well as decoding or fluency, and are not identified as requiring special education through an IEP, receive LLI by a reading specialist. LLI is delivered in small groups ranging from three-to-six children in addition to the regular education programming. The intervention is delivered for 30-minutes, four times per six-day cycle during specials.

Students with IEP's in Tier 2, who have identified reading disabilities, receive LLI. These students receive LLI for 30-minutes three times per six-day cycle during specials; however, they also receive 30-minutes of LLI daily provided by a special education teacher during guided reading. The daily LLI will be delivered as replacement instruction during the guided reading block of time taking place in the regular education setting.

Tier 3

Students in Tier 3 require the most intensive level of instruction. These students are identified as needing special education and have IEP's. Students in Tier 3 receive LLI, iReady, Fast ForWord(FF) or Read 180. Students in grades 2 and 3 receive LLI, which is delivered by a

teacher. Students in grades two through four, who have needs in phonics, vocabulary and comprehension needs, and do not benefit from an intervention delivered in a group setting, are assigned the iReady intervention. Students in grade 5 requiring the most intensive level of instruction receive Read 180, which is a blended-learning model which includes both computer-based instruction and teacher instruction. These students receive 30-minutes of supplementary instruction during specials three times per six-day cycle. Additionally, they receive 60-minutes of replacement instruction daily by a special education teacher. The LLI program requires direct instruction by a teacher with independent practice, while the Read 180 program is a combination of direct instruction, computer-based instruction, and independent practice. Two participants received a combination of programs in which they received 30 minutes of replacement instruction from the LLI model and 30 minutes of supplementary instruction through the FF program. Students who have significant deficits with phonics and working memory, as well as comprehension concerns, are targeted for this combination of interventions. The data of these two students were not included in the intervention analysis due to the low number of participants.

Interventions were delivered by highly-skilled educators who have been trained to implement the interventions through ongoing professional development. Participants were not randomly assigned, and they were subjected to a single treatment. The effectiveness of the interventions was evaluated through a pretest/ posttest design. The data from students who remained in the intervention for the 30-week period were analyzed and used in the study. Results of students' self-efficacy through the RSPS were analyzed at the conclusion of the 30-week intervention period.

Procedures for Study

The evaluation of the interventions began with obtaining benchmark reading levels through the BAS and a quantitative measure of reading ability through the MAP. The grade level expectations using the Fountas and Pinnell leveling system for students at the beginning of the year are: grade two- K; grade three- N; grade four- Q; grade five- T. Numerical values were assigned to these reading levels for data-collection purposes. Values of 1 through 26 were assigned to the reading levels A through Z.

The primary reason for using the MAP assessment in the district is to quantify and calculate student growth from the beginning of the year to the end of the year; however, the participating district also uses the data as a universal screener to determine reading ability and needs in order to determine which students are in need of interventions. National norms for the MAP assessments for the beginning of the year were used to identify students who are not meeting grade level expectations. National norms for the beginning of the year are: 174.7 for students in grade two; 188.3 for students in grade three; 198.2 for students in grade four; and 205.7 for students in grade five. Initial student data were analyzed and program recommendations were made for students not reading at a proficient level. Student progress was monitored and reading skills were assessed throughout the year. Teachers administered the MAP assessment and the BAS at the end of the year to measure reading growth.

Table 3.1
MAP National Norms

Grade	Beginning of Year	End of Year
2	174.7	188.7
3	188.3	198.6
4	198.2	205.9
5	205.7	211.8

Setting and Sample

The participating elementary school is located in the suburbs of Philadelphia. During the 2016 – 2017 academic year, there were 619 students in the school and 61 faculty and staff members. The elementary school contains seven sections of grades two and five and six sections of grades three and four. Students who qualify for special education services (non-exceptional) make up 19% of the population; the ESL population makes up 1% of the population; 23% of students are socioeconomically disadvantaged. The elementary school also contains the emotional support program for elementary-aged students. The racial makeup of the school is 78.5% Caucasian, 7% African-American, 7% Asian, 6% Multiracial, and Hispanic, Hawaiian, Pacific Islander, and American Indian all account for less than 1.5% of the population.

Group assignments were not random for this study. Reading data were collected on all students, and 607 students enrolled in the school for the entirety of the year participated in the study. Students were placed in groups by grade level and reading ability levels obtained by the pre-assessments given in the fall. After the fall BAS, students in the intervention programs were monitored and assessed throughout the program at a minimum of a biweekly basis using the

respective assessment tools of the intervention programs. All students received instruction of the regular education curriculum when they were not receiving the reading intervention instruction.

Instrumentation and Materials

The Reader Self-Perception Scale (RSPS) was used to measure students' self-efficacy in order to provide data on how students feel about themselves as readers. The RSPS consists of 33 items that assess students' self-perceptions in five areas- (a) the students' general perception of themselves as readers; (b) reading progress; (c) how students compare their reading abilities to their peers' reading abilities; (d) teacher feedback; (e) physiological states- how students feel about reading. Students were asked to indicate how strongly they agree or disagree on a five-point scale for each of the 33 statements provided. Classroom teachers administered the RSPS to all students. Students in grades four and five completed the scale independently, while teachers read aloud each statement to students in grades two and three. The RSPS was administered at the end of the 30-week intervention period. The RSPS can help detect students who have low self-perceptions and assist teachers with building confidence as readers. Motivation is an important factor in reading instruction. "Current motivational theory emphasizes the role of self-perceived competence and task value as determinants of motivation and task management" (Codling, Gambrell, Mazzoni, & Palmer, 1996, p.532).

The data gained from this scale assisted in analyzing and comparing students' self-efficacy in the area of reading. "The RSPS has strong internal consistency and reliability. The norming of the instrument has been quite extensive, and the scale provides meaningful data" (Henk & Melnick, 1995, p.476). A perfect Pearson correlation would measure $r = 1.00$, the

correlation for the scales included in the RSPS range from *r*=.88 to *r*=.95 (Henk, Marinak, & Melnick, 2009). The RSPS and scales adapted from the RSPS have been used in a number of subsequent studies (Alrwele, 2015; Codling, et al., 1996; Henk et al., 2009; Nes Ferrara, 2005).

The MAP and BAS were used to determine reading levels for initial benchmark reading levels and the summative evaluation of reading levels and skills at the end of the year. The intervention programs used were the Fast Forword, Fountas & Pinnell Leveled Literacy Intervention, Scholastic Read 180, Read Naturally, and teacher-created programming.

The BAS and MAP were used to identify reading ability. Quality, research-based pre-assessments and post-assessments are necessary for obtaining valid data. Benchmark assessments allow teachers to identify students in need of interventions before they fall too far behind. The MAP assessment is a computer-based adaptive assessment. If students answer questions correctly, the program increases the difficulty of the questions. Answering questions incorrectly will result in a decrease in the level of difficulty of the questions. The assessment is delivered in a whole group setting; however, the students take the computer-based assessment independently. It is a multiple-choice assessment that measures students' reading comprehension skills. The assessment is self-paced. The assessment takes approximately one hour depending on how quickly students read and respond to the questions.

Teachers report the instructional and independent reading levels of all students at the end of each trimester. Trimester One ended December 2, 2016; Trimester Two- March 10, 2017; Trimester Three- June 16, 2017. Instructional reading levels were reported based on the BAS. Teachers computed the accuracy rate and self-correction ratio, and completed a miscue analysis. They also rated each child's fluency and level of comprehension in order to determine if the text

represents the level of reading appropriate for independent reading (Collins, 2004, p. 95). Teachers administered the BAS to students in a one-on-one setting. Students read an unfamiliar text or a portion of the text aloud while the teacher recorded miscues, self-corrections, omissions, additions, errors, and fluency. As the text levels and length increase, students read a portion of the text aloud, and the remainder of the text silently. Teachers assessed comprehension of the text by asking students questions after completing the reading. The level of questioning ranges in complexity from recall to evaluative. Teachers determined whether the reading level was *independent*, *instructional*, or *hard* for the student, and assigned a letter accordingly. The BAS provided data on the incremental growth of students' reading levels. The MAP assessments provided a summative reading score and quantitative measure of growth from the beginning of the year to the end of the year.

The Northwest Evaluation Association (NWEA) MAP assessments are a commonly used benchmark assessment tool throughout the country. National norms for MAP assessments are created using data from more than 10.2 million students across 49 states (2015). Content of MAP assessments are aligned with current academic state standards. NWEA MAP assessments correspond well to similar assessments of the same content. Minimally accepted reliability Using Pearson correlation is $r = .80$, and a perfect correlation is $r = 1.00$. Strong concurrent validity has been shown with MAP assessments measuring in the mid.-.80's using the Pearson correlation coefficient (2004).

Reliability of assessments determine the level of consistency, which is often measured by a test-retest design. MAP assessments are computer adaptive assessments intended to be administered 7-12 months apart. While time can erode test correlation and the hope is that students' scores are greater on the retest, NWEA reports correlations of mid-.80's to the low

.90's on MAP tests. Less reliability was seen at the grade two level, dropping slightly below .80 in two instances (2004).

The BAS assesses student reading levels through leveled texts and recording forms that measure reading accuracy, fluency, and comprehension. The BAS was demonstrated to be a valid and reliable assessment tool for assessing students' reading levels. The BAS relationship with a similar comprehensive reading assessment tool, the Reading Recovery Text Level Assessment Books, has a correlation of r=.94 for fiction texts and r=.93 for nonfiction texts levels A-N. The correlation for upper elementary grades was not as strong when compared to the Slosson Oral Reading Test, (.69 for fiction texts and .62 for nonfiction texts); however, the BAS includes more assessment components (fluency and comprehension) than the Slosson Oral Reading Test, which measures only word reading (Fountas & Pinnell, n.d.).

CHAPTER 4: RESULTS

Introduction

The core purpose of this research was to investigate whether the various types of reading interventions used in the participating elementary school are effective in increasing students' reading growth. The three major research questions addressed were:

(1) Are the various reading intervention programs effective in improving student reading growth? If so, which intervention programs produce the greatest results in terms of increased reading ability?

(2) Are there differences in reading growth based on socioeconomic status, gender, or grade level?

(3) How do students perceive themselves after receiving additional reading support through interventions?

Demographic Data

The sample for this study consisted of 607 students in grades 2-5 at the participating elementary school which is located in the suburbs of a large urban center in the Northeastern section of the county. The number of participants at each grade level are as follows, Grade 2- 143; Grade 3- 146, Grade 4- 157; Grade 5- 161. There are 316 males and 291 females who participated in the research. Of these, 132 students are socioeconomically disadvantaged. Disaggregated by race, there are 476 Caucasian students; 43 Black/ African-American; 43 Asian; 36 Multiracial; 5 Hispanic; 3 Pacific Islander; 1 American Indian/ Alaskan. Table 4.1 reports the

number of participants in the study by type of reading intervention. Additionally, the abbreviations for each intervention are included in Table 4.1 to assist readers with tracking of the interventions throughout the analysis.

Table 4.1
Tabulation of Student Classification

Level of Intervention	**Abbreviations**	**Number of Students**
No Intervention	Non-RI	405
Teacher-Created (Tier 2 Supplemental)	A-*TC*	38
LLI (Tier 2 Supplemental)	B-*LLI1*	51
RN (Tier 2 Supplemental)	C-*RN*	38
LLI (Tier 2 Supplemental & 30 Minutes of Daily Replacement)	D-*LLI2*	39
LLI (Tier 3 Supplemental & 60 Minutes of Daily Replacement)	E-*LLI3*	15
iReady (Tier 3 Supplemental & 45 Minutes of Daily Replacement)	F-*iR*	10
Read 180 (Tier 3 Supplemental & 60 Minutes of Daily Replacement)	G-*R180*	11

As shown in Table 4.1, there were 202 students used of this research who received reading interventions and 405 who did not receive an intervention. Another reading intervention was used during this study, but the sample size was too small to be included in the statistical analyses.

Analyses for Research Question # 1:

Are the various reading intervention programs effective in improving student reading growth? If so, which intervention programs produce the greatest results in terms of increased reading ability?

There were two types of data used to answer this question: the BAS Reading assessment and the MAP assessment. Means and standard deviations for the BAS are contained in Table 4.2.

Table 4.2
Descriptive Statistics for BAS Reading Assessments

	Level of Intervention	Mean	Standard Deviation	Number of Students
BAS Initial Reading Level	Non-RI	15.49	3.61	405
	A-*TC*	17.26	1.78	38
	B-*LLI1*	11.92	3.14	51
	C-*RN*	13.61	3.01	38
	D-*LLI2*	15.03	2.48	39
	E-*LLI3*	8.13	2.87	15
	F-*iR*	10.40	2.59	10
	G-*R180*	13.91	4.88	11
	Total	14.86	3.77	607
BAS Final Reading Level	Non-RI	19.08	3.30	405
	A-*TC*	20.53	1.40	38
	B-*LLI1*	16.08	2.32	51
	C-*RN*	17.39	3.10	38
	D-*LLI2*	18.33	2.25	39
	E-*LLI3*	12.00	2.97	15
	F-*iR*	13.10	2.84	10
	G-*R180*	15.64	4.54	11
	Total	18.43	3.48	607

The data in Table 4.2 were analyzed by a two-factor, repeated measures analysis of variance (Initial Level/Final Level by Type of Intervention). The ANOVA summary table is presented below. The table presents the core results of the ANOVA including partial eta squared which is the most commonly used metric for effect size in ANOVA. The common benchmarks for partial eta squared as as follows:

.00 - .05 **Small**

.06 - .10 **Medium**

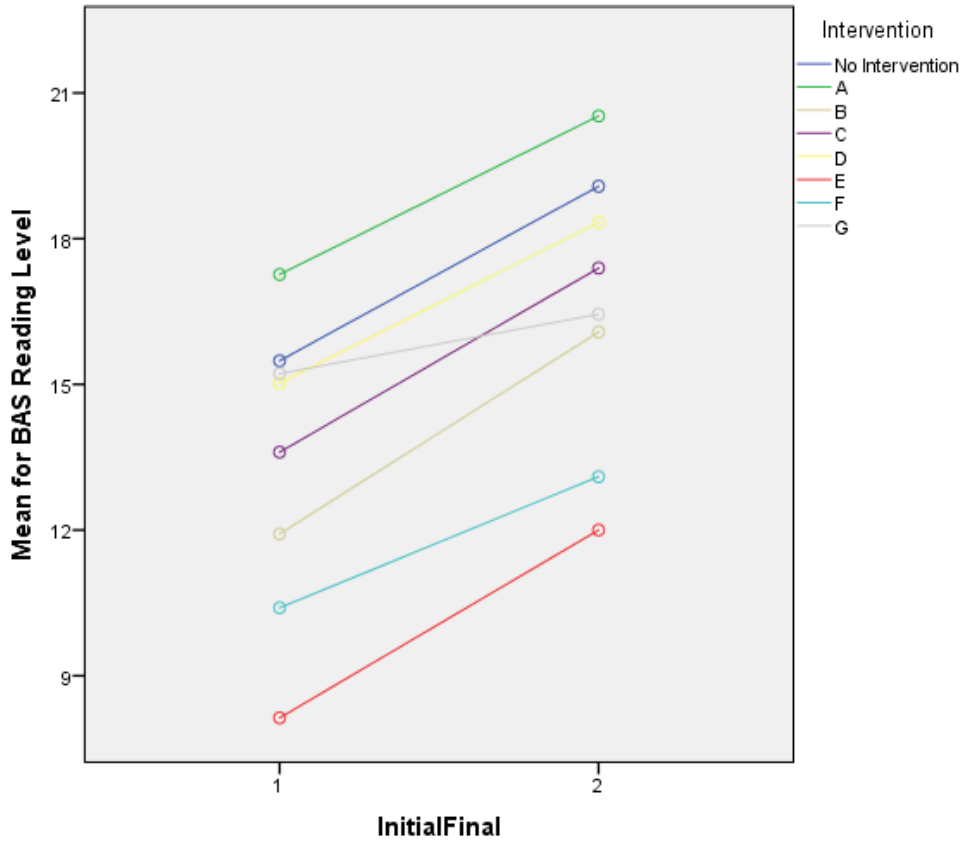
.11 and above **Large**

Table 4.3
ANOVA Summary Table for BAS Initial/ Final Comparison

Source	Mean Square	F	Significance	Partial Eta Squared
Between Subjects				
Intervention Type	473.75	23.87	.000	.219
Error	19.83			
Within Subjects				
Initial/Final Level	886.93	885.51	.000	.597
Interaction	6.06	6.08	.000	.066
Error	1.01			

As shown in Table 4.3, there is a significant main effect for intervention type and for initial/final level, as well as a significant interaction. A graph of the results in presented below.

Figure 4.1: *Initial/Final Level on the BAS by Intervention Type*



As shown in Figure 4.1, all of the groups increased between the initial and the final assessment. To follow this analysis up, paired samples t-tests by type of intervention were computed. These results are in Table 4.4.

Table 4.4
BAS Means by Group & Paired Samples Test

Intervention	T	Sig.
Non-RI	51.004	.000**
A-*TC*	18.166	.000**
B-*LLI1*	17.097	.000**
C-*RN*	20.879	.000**
D-*LLI2*	21.740	.000**
E-*LLI3*	20.149	.000**
F-*iR*	4.669	.001*
G-*R180*	1.974	.077

**p < .001; *p < .005

As shown in Table 4.4, the students in all intervention groups with the exception of Intervention G-R180 significantly increased on the BAS between the initial and final assessment. As a further analysis of the BAS data, the analysis was run again, but this time using the initial assessment as a covariate. This analysis answers the question: Where would the various groups end up if they started as the same point? The analysis produced a significant effect for intervention (F = 7.76, p=.000, partial eta squared = .084). The adjusted means are presented in Table 4.5.

Table 4.5
Adjusted Means for Intervention Groups

Intervention	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Non-RI	18.576	.065	18.449	18.704
A-*TC*	18.552	.213	18.134	18.970
B-*LLI1*	18.528	.187	18.161	18.895
C-*RN*	18.450	.211	18.036	18.864
D-*LLI2*	18.212	.207	17.806	18.619
E-*LLI3*	17.588	.350	16.900	18.275
F-*iR*	16.810	.415	15.996	17.625
G-*R180*	16.160	.431	15.314	17.007

The follow-up to the results in Table 4.5 indicated that interventions A-*TC*, B-*LLI1*, C-*RN*, and D-*LLI2* did not differ from the No Intervention group. Interventions E-*LLI3* and F-*iR* were both significantly lower; intervention G-*R180* was significantly lower than E-*LLI3* and F-*iR*.

Data for the MAP Assessment are presented in Table 4.6:

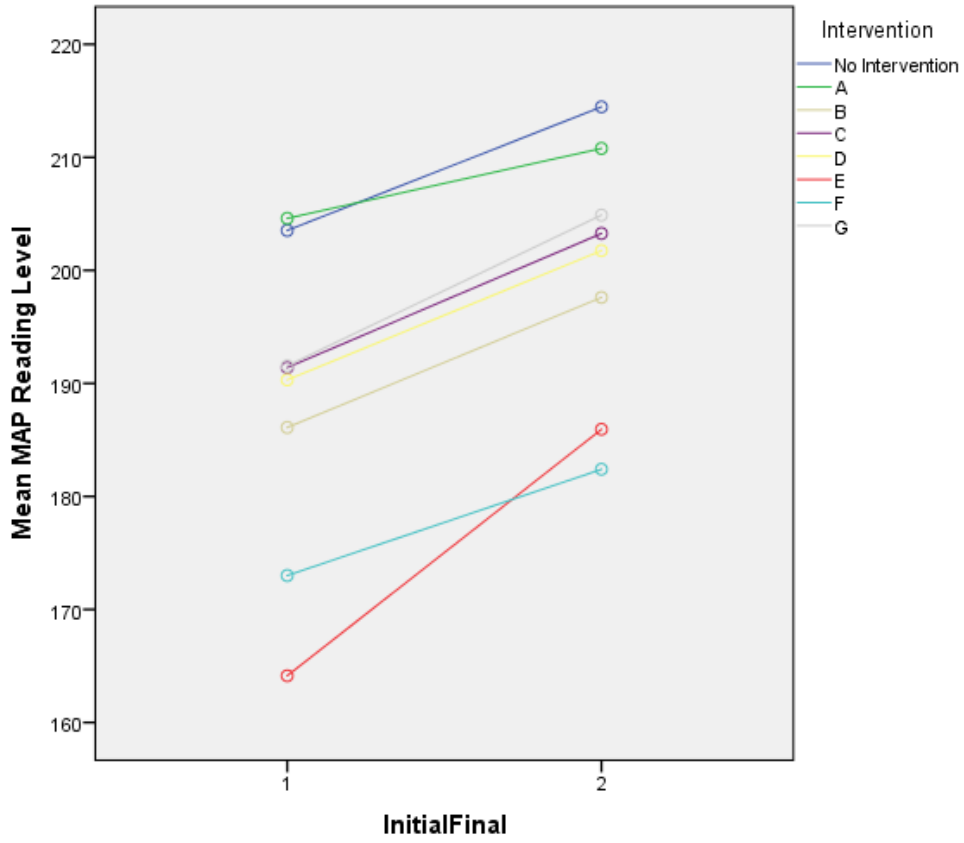
Table 4.6
Descriptive Statistics for MAP Reading Assessments

	Level of Intervention	Mean	Standard Deviation	Number of Students
MAP Initial Reading Level	Non-RI	203.53	18.89	405
	A-*TC*	204.61	11.12	38
	B-*LLI1*	186.10	19.14	51
	C-*RN*	191.39	21.68	38
	D-*LLI2*	190.31	15.02	39
	E-*LLI3*	164.13	14.62	15
	F-*iR*	173.00	14.00	10
	G-*R180*	185.36	25.06	11
	Total	198.72	20.48	607
MAP Final Reading Level	Non-RI	214.46	15.25	405
	A-*TC*	210.79	7.83	38
	B-*LLI1*	197.61	16.08	51
	C-*RN*	203.26	16.52	38
	D-*LLI2*	201.74	13.08	39
	E-*LLI3*	185.93	14.35	15
	F-*iR*	182.40	17.69	10
	G-*R180*	198.64	23.81	11
	Total	209.78	17.00	607

Table 4.7
ANOVA Summary Table for MAP Initial/ Final Comparison

Source	Mean Square	F	Significance	Partial Eta Squared
Between Subjects				
Intervention Type	12011.79	23.34	.000	.215
Error	514.69			
Within Subjects				
Initial/Final Level	12304.08	244.18	.000	.290
Interaction	196.79	3.91	.000	.044
Error	50.39			

Figure 4.2: *Initial/Final Level for MAP Assessment by Intervention Type*



As before, both main effects and the interaction are significant. The Initial/Final comparisons for all intervention types are presented in Table 4.8.

Table 4.8
MAP Means by Group & Paired Samples Test

Intervention	***T***	**Sig.**
Non-RI	23.465	.000**
A-*TC*	4.456	.000**
B-*LLI1*	7.210	.000**
C-*RN*	5.032	.000**
D-*LLI2*	6.107	.000**
E-*LLI3*	11.657	.000**
F-*iR*	3.740	.005*
G-*R180*	3.975	.003*

***p* < .001; *p < .005

The same process was completed with the MAP as was done with the BAS. The analysis was re-run using the initial MAP score as the covariate. This produced a significant effect (F = 5.48, p = .000, partial eta squared = .064). The adjusted means are presented in Table 4.9.

Table 4.9:
Adjusted Means for the MAP

Intervention	**Mean**	**Std. Error**	**95% Confidence Interval** Lower Bound	Upper Bound
Non-RI	211.255	.417	210.437	212.074
A-*TC*	206.846	1.336	204.222	209.471
B-*LLI1*	206.355	1.173	204.050	208.659
C-*RN*	208.378	1.339	205.748	211.008
D-*LLI2*	207.604	1.324	205.003	210.205
E-*LLI3*	209.741	2.213	205.394	214.087
F-*iR*	200.128	2.639	194.944	205.311
G-*R180*	209.894	2.741	204.511	215.276

The results for the MAP are somewhat more complex than the results for the BAS. As shown in Table 4.9, it is intervention groups G-*R180*, E-*LLI3* and C-*RN* that have the highest means (after the Non-RI) group after adjusting the means to determine where students would end the intervention period had they all started at the same reading level.

Reading Data by Tier

Increasing intervention levels require increased services, time, and personnel. Interventions become more individualized when previous interventions prove to be ineffective. A Response to Intervention (RTI) model is implemented with a goal of matching students' needs with the type and level of support needed so that students can make necessary growth. In order to be effective, the level of intervention must be appropriate. While no RTI level is more important than the others, the effectiveness of each tier is essential in order to maximize student success and limit the number of students with academic concerns. This study included analyses by tiers within the RTI model.

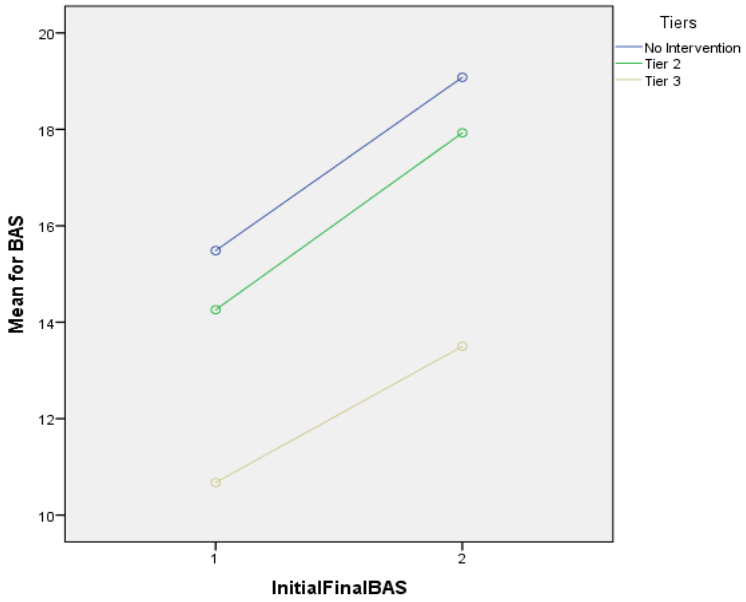
Table 4.10
Descriptive Statistics for BAS Reading Assessments by Tiers

	Tiers	**Mean**	**Std. Deviation**	**N**
BAS Initial Reading Level	No Intervention	15.49	3.616	405
	Tier 2	14.26	3.343	166
	Tier 3	10.68	4.304	34
	Total	*14.88*	*3.762*	*605*
BAS Final Reading Level	No Intervention	19.08	3.300	405
	Tier 2	17.93	2.851	166
	Tier 3	13.50	3.800	34
	Total	*18.45*	*3.466*	*605*

Table 4.11
ANOVA Summary Table for BAS by Tiers

	Df	Mean Square	F	Significance	Partial Eta Squared
Initial/Final	1	1341.553	1282.441	.000	.681
Tier	2	920.969	41.611	.000	.121
Interaction	2	5.192	4.963	.007	.016

Figure 4.3: *Initial/Final BAS Assessment by Tiers*



All three tiers showed significant increases in reading growth as measured by the BAS. Students in Tier 1 (No Intervention) and Tier 2 showed higher increases in reading growth than the students who received Tier 3 interventions.

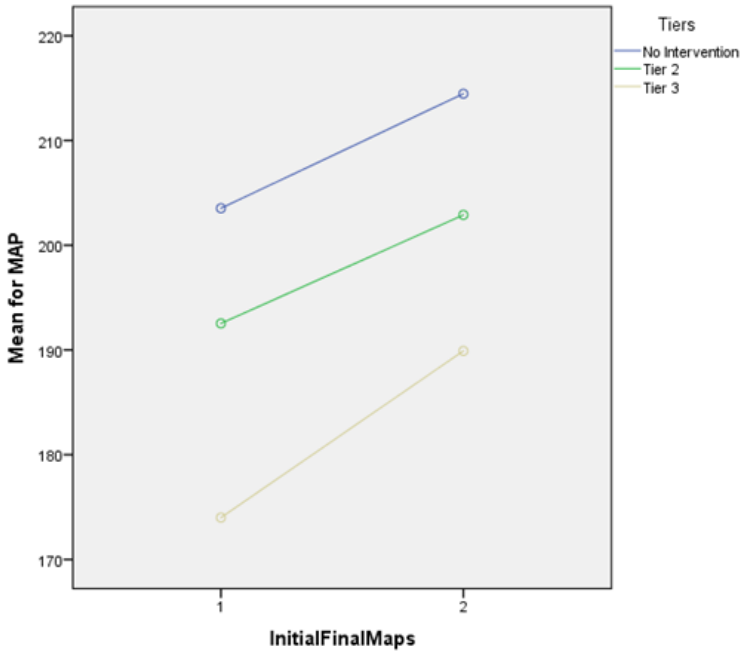
Table 4.12
Descriptive Statistics for MAP Reading Assessments by Tiers

	Tiers	Mean	Std. Deviation	N
MAP- Fall	No Intervention	203.53	18.890	405
	Tier 2	192.54	18.548	166
	Tier 3	174.00	20.113	34
	Total	198.85	20.375	605
MAP- Spring	No Intervention	214.46	15.252	405
	Tier 2	202.89	14.702	166
	Tier 3	189.91	19.263	34
	Total	209.91	16.878	605

Table 4.13
ANOVA Summary Table for MAP by Tiers

	Df	Mean Square	F	Significance	Partial Eta Squared
Initial/Final	1	18252.145	354.280	.000	.370
Tier	2	33103.845	61.290	.000	.169
Interaction	2	222.369	4.316	.014	.014

Figure 4.4: *Fall/Spring MAP Assessment by Tiers*



Similar to the BAS analysis by RTI tiers, all three tiers showed significant increases in reading growth as measured by the MAP; however, students in Tier 3 showed greater reading gains than the students in Tier 1 (No Intervention) and Tier 2 students on the MAP assessment, unlike the BAS.

Research Question #2

(2) Are there differences in reading growth based on socioeconomic status, gender, or grade level?

The second research question analyzes reading growth for various subgroups. This study examined grade level, socioeconomic status, and gender.

Grade

The participating elementary school consists of four grade levels, 2-5. There were seven sections of Grades 2 and 5 and six sections of Grades 3 and 4 during this study. A total of 607 participants were included- Grade 2- 143; Grade 3- 146; Grade 4- 157; Grade 5- 161. The means and standard deviations for the BAS by grade level are included in Table 4.14.

Table 4.14
Descriptive Statistics for BAS Reading Assessments by Grade

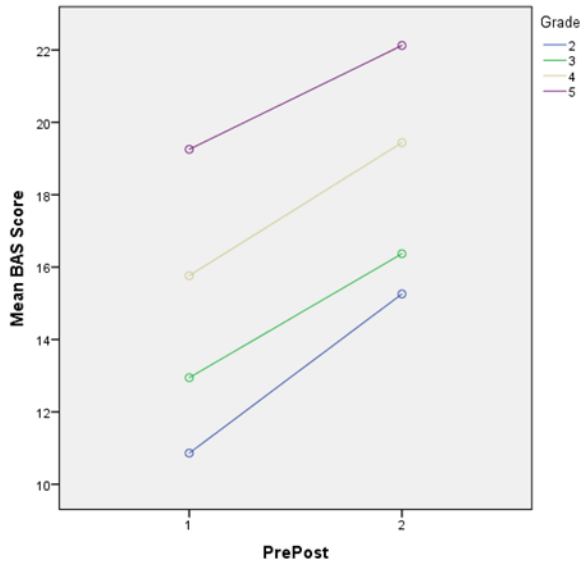
	Tiers	Mean	Std. Deviation	N
BAS Initial Reading Level	2	10.86	1.867	143
	3	12.95	2.117	146
	4	15.76	2.134	157
	5	19.25	2.137	161
BAS Final Reading Level	2	15.26	1.635	143
	3	16.37	2.003	146
	4	19.44	2.668	157
	5	22.12	2.318	161

The results of the ANOVA summary are presented in Table 4.15, which show a significant effect for the initial/final assessment, grade, and the interaction.

Table 4.15
ANOVA Summary Table for BAS by Grade

	Df	Mean Square	F	Significance	Partial Eta Squared
Initial/Final	1	3906.436	4280.364	.000	.877
Grade	3	3461.640	420.254	.000	.676
Interaction	3	30.33	33.235	.000	.142

Figure 4.5: *BAS by Grade*



As shown in Table 4.15 there is a significant effect for Initial/Final BAS and a significant effect for grade. The interaction is also significant. While all grade levels demonstrated significant growth as measured by the BAS, the students in Grade 2 made significantly more reading growth than the other grade levels.

Table 4.16
Descriptive Statistics for MAP Reading Assessments by Grade

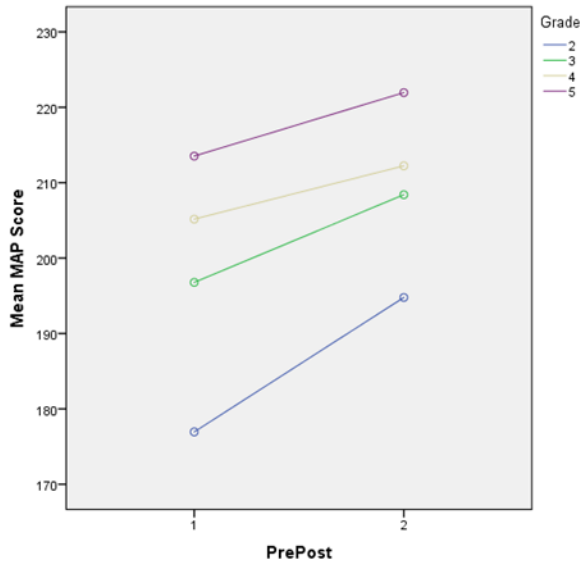
	Tiers	Mean	Std. Deviation	N
MAP Initial Reading Level	2	176.95	16.307	143
	3	196.11	15.267	146
	4	205.17	14.910	157
	5	213.53	15.376	161
MAP Final Reading Level	2	194.78	13.184	143
	3	208.41	12.959	146
	4	212.24	16.412	157
	5	221.94	12.962	161

Table 4.16 displays the initial and final means by grade level as measured by the MAP assessment. Table 4.17 is a summary table by grade level using the MAP assessment.

Table 4.17
ANOVA Summary Table for MAP by Grade

	Df	Mean Square	F	Significance	Partial Eta Squared
Initial/Final	1	38231.120	873.139	.000	.592
Grade	3	54089.921	138.444	.000	.408
Interaction	3	1703.021	38.894	.000	.162

Figure 4.6: *MAP by Grade*



Consistent with the results for the BAS there is a significant main effect for Initial/Final assessment. All grade levels demonstrated significant reading growth as measured by the MAP. Similar to the BAS, there is a significnat main effect for grade level, and the interaction is

significant. Again, second grade students demonstrated more reading growth than the students in the other grade levels as measured by the MAP.

Gender

The analyses presented above were run again, but in this case gender was the between subjects factor. For both BAS and MAP there was a significant main effect for gender. In both cases girls scored higher than boys. There were, however, no interactions. Girls had a higher mean for BAS and MAP for the initial and final assessments; however, girls did not respond better or worse to the reading interventions than boys.

SES

The analysis for SES duplicated the analyses for gender. As before, there was a significant effect for SES with students in the lower category having lower means for both initial and final assessments as measured by the MAP and BAS. Also as before, neither interaction was significant. Students with a low socioeconomic status did not respond better or worse to the reading interventions compared to the students who were not identified as having a low socioeconomic status.

Research Question #3

How do students perceive themselves after receiving additional reading support through interventions?

The third research question was designed to determine how students perceive themselves after receiving additional reading support through interventions. The RSPS includes a measure of readers' general self-perceptions, and four subscales- progress, observational comparison, social

feedback, and physiological states. This study included a focus on students' general perception of themselves as readers; however, results were consistent across the five areas of students' self-perception as readers. Table 4.18 presents the means and Table 4.19 presents the results of the ANOVA.

Table 4.18
Descriptive Statistics for Reader Self-Perception by Intervention

	Level of Intervention	**Mean**	**Standard Deviation**	**Number of Students**
General Perception	Non-RI	4.29	.712	405
	A-*TC*	3.63	.852	38
	B-*LLI1*	3.84	.987	51
	C-*RN*	3.97	.788	38
	D-*LLI2*	3.54	1.022	39
	E-*LLI3*	3.33	1.113	15
	F-*iR*	3.70	.675	10
	G-*R180*	3.64	1.286	11
	Total	*4.10*	*.845*	*607*

Table 4.19
ANOVA Summary Table for Self- Perception by Intervention

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intervention	49.499	7	7.071	11.307	.000	.117
Error	373.351	597	.625			

Table 4.20
Tukey Results for Self –Perception by Intervention

Group	Mean	E-*LLI3*	D-*LLI2*	A-*TC*	B-*LLI1*	F-*iR*	G-*R180*	C-*RN*	None
E-*LLI3*	3.33	-							
D-*LLI2*	3.54	NS	-						
A-*TC*	3.63	NS	NS	-					
B-*LLI2*	3.70	NS	NS	NS	-				
F-*iR*	3.59	NS	NS	NS	NS	-			
G-*R180*	3.89	NS	NS	NS	NS	NS	-		
C-*RN*	3.97	NS	NS	NS	NS	NS	NS	-	
None	4.29	.000	.000	.000	.004	NS	NS	NS	-

As shown in Table 4.20 Non-RI students have the highest self-perception and are significantly different from four of the seven intervention groups. Further analyses were run to determine if there were differences in students' self-perception when grouped by tiers within the RTI model. Table 4.21 shows descriptive statistics for students' self-perception using the RSPS when grouped by tiers.

Table 4.21
Descriptive Statistics for Reader Self-Perception by Tier

	Group	**N**	**Mean**	**Std. Deviation**
General Perception	Tier 1	405	4.29	.712
	Tier 2	166	3.75	.931
	Tier 3	34	3.59	.988
	Total	*605*	*4.10*	*.837*

Table 4.22
ANOVA Summary Table for Self- Perception by Tier

		Sum of Squares	df	Mean Square	F	Sig.
General Perception	Between Groups	42.965	2	21.483	34.044	.000
	Within Groups	379.884	602	.631		
	Total	422.850	604			

Table 4.23
Tukey Results for Reader Self-Perception by Tier

Group	Mean	Tier 3	Tier 2	No Intervention
Tier 3	3.59	-		
Tier 2	3.75	NS	-	
No Intervention	4.29	.000	.000	-

Table 4.23 shows the Tukey results for students' self-perception by RTI tiers as measured by the RSPS. Students in Tier 1 (No Intervention) perceive themselves as better readers than students in Tiers 2 and 3. Students' self-perception is higher in Tier 2 intervention groups compared to students in Tier 3; however, the difference is not significant.

Summary

This chapter provided a detailed presentation of the results of this causal-comparative, nonexperimental research project, describing the statistical analysis of the data. Research question one addressed whether students made significant gains in reading between the beginning and end of the school year and whether there is a difference in gains among the various interventions. The results for this question were conclusive: students in all intervention groups made significant gains on both the BAS and MAP with one exception. The one exception was intervention group G-*R180* where the students' gains on the BAS did not reach the

conventional .05 level of significance (p = .07). As shown in the subsequent ANCOVA analyses, however, the pattern is somewhat more complex than this. When all of the groups were equated at the initial point on the BAS, intervention groups E-*LLI3,* D-*LLI2,* and F-*iR* made significantly lower gains than the other interventions. For the MAP, the results were even more complex. While the Non-RI group made the greatest gains, intervention groups E-*LLI3* and G-*R180* made more gains than the other interventions.

Further analyses were conducted to determine the success of the interventions by RTI tiers. Data revealed a significant increase for all three levels when measured by the BAS and MAP assessments. Students who received Tier 3 interventions showed smaller increases in reading growth than students in Tier 2 and Tier 1 (No Intervention) as measured by the BAS; however, when measured by the MAP assessments, the increase in reading growth for Tier 3 students was larger than students in Tier 2 and Tier 1.

Research question two addressed the differences in reading growth based on socioeconomic status, gender, and grade level. The variables, socioeconomic status and gender showed a relatively simple effect: females are reading better than males, and higher SES students were reading better than lower SES students. These differences, however, were not related to the intervention. The effects for grade level were slightly more complex. The results showed a significant main effect for grade level and a significant interaction on both the BAS and MAP. Students at all grade levels were showing significant growth in reading using both assessment measures. However, second grade students were demonstrating greater reading growth than third, fourth, and fifth grade students.

Research question three addressed how students perceive themselves after receiving additional reading support through interventions. The results show a significant main effect between Non-RI students and RI students with a large effect size (.119). A Tukey HSD revealed students in Groups A-*TC*, B-*LLI1*, D-*LLI2*, and E-*LLI3* have lower self-perceptions as readers than the Non-RI students. Consistently, when data were run by tiered groups, students who were in Tier 1 (No Intervention) perceive themselves as better readers than students in Tiers 2 and 3. There was not a significant difference in self-perception between students in Tiers 2 and 3.

CHAPTER 5: SUMMARY

Introduction

The purpose of this study was to determine the effectiveness of reading interventions and the impact reading ability has on self-efficacy. The results of the research may assist school leaders in making decisions about reading intervention programming. This chapter presents a comprehensive summary of the entire study. Included in the chapter are a summary of the study, discussion of the findings, recommendations for future research and practical use and conclusion. The study employed a quantitative, causal-comparative, nonexperimental design involving Non-Reading Intervention (Non-RI) students and Reading Intervention (RI) students in seven different intervention groups. A pre-test/ post-test design was used to measure reading growth using scores from the Northwest Evaluation Association Measure of Academic Progress (MAP) assessments and instructional reading levels measured by the Fountas & Pinnell Benchmark Assessment System (BAS) assessments. The Reader Self-Perception Scale (RSPS) was used to assess students' self-efficacy in the area of reading.

Table 5.1 is presented to provide readers with reminders of the interventions and corresponding abbreviations.

Table 5.1
Interventions and Abbreviations

Level of Intervention	Abbreviations
No Intervention	Non-RI
Teacher-Created (Tier 2 Supplemental)	A-*TC*
LLI (Tier 2 Supplemental)	B-*LLI1*
RN (Tier 2 Supplemental)	C-*RN*
LLI (Tier 2 Supplemental & 15 Minutes of Daily Replacement)	D-*LLI2*
LLI (Tier 3 Supplemental & 60 Minutes of Daily Replacement)	E-*LLI3*
iReady (Tier 3)	F-*iR*
Read 180 (Tier 3)	G-*R180*

Summary of the Study

Discussion of Research Question 1-BAS

The first research question in the study attempted to determine if the reading intervention programs included in this study were effective in improving student reading growth, and if programs were effective, which intervention programs produced the greatest results in terms of increased reading ability.

As measured by the BAS, all intervention groups produced significant growth in reading (**$p < .001$; *$p < .005$) with the exception of Intervention G, the Read 180 group (t=1.974). Data were analyzed to determine final reading level means of each intervention group had all students started at the same point. That analysis produced a significant effect for intervention with a medium effect size (p=.000, partial eta squared = .084).The adjusted means indicated that Tier 2 intervention groups-A-*TC*, B-*LLI1*, C-*RN*, and D-*LLI2*- did not differ, and they did not differ from the Non-RI students. The means for the Tier 3 students in groups E-*LLI3* and F-*iR* were

significantly lower than the students receiving Tier 2 interventions. Intervention Group G-*R180* was significantly lower than the other Tier 3 groups, E-*LLI3* and F-*iR*.

The greatest growth of the three groups was demonstrated by students in the Tier 2 groups. The Leveled Literacy Intervention (LLI) system was used for interventions in three of the seven groups- A-*TC*, D-*LLI2*, and the Tier 3 intervention, E-*LLI3*. The results of the teacher-created program, A-*TC*, and the Read Naturally, C-*RN*, program yielded consistent results with the Tier 2 groups. The BAS assessment requires teachers to administer the assessment in a one-on-one setting reading printed texts, similar to the way interventions A-*TC*, B-*LLI1*, D-*LLI2*, and E-*LLI3* are delivered to students. Interventions C-*RN*, F-*iR*, and G-*R180* are computer-based interventions, with some teacher instruction.

The Tier 3 interventions- E-*LLI3*, F-*iR*, and G-*R180*, produced significantly lower results compared to the Tier 2 interventions. More time, frequency, and intensity of programming did not result in greater reading growth. It can be argued that increasing the dose of the intervention does not increase reading ability as evidenced by comparing the means of Interventions B-*LLI1* and D-*LLI2* with Intervention E-*LLI3*, all of which use the LLI program. Interventions F-*iR* and G-*R180* were strictly used as Tier 3 interventions and require more time, intensity and acuity, but yielded lower results than Tier 2 interventions after adjusting the means.

Discussion of Research Question 1-MAP

A second measure of reading growth, MAP assessments, was used for increased validity. MAP assessments are an adaptive, computer-based, nationally norm-referenced reading assessment. Interventions A through E showed highly significant main effects (p <.001) through MAP; Interventions F-*iR* and G-*R180* produced significant main effects (p<.005). Intervention

E-*LLI3* (*t*= 11.657) showed the greatest growth as measured by MAP, followed by Intervention B-*LLI1* (*t*=7.210) and Intervention D-*LLI2* (*t*=6.107), all of which use the LLI program. Intervention Groups A-*TC* (*t*= 4.456) and C-*RN* (*t*=5.032) produced similar results.

The data were run again using the initial MAP scores as the covariate so that final assessment means could be adjusted to determine where the groups would end up if all of the groups started at the same point. That analysis produced a significant effect for intervention with a medium effect size (*p*=.000, partial eta squared = .084). Unsurprisingly, the Non-RI students had significantly higher adjusted means (211.255) compared to RI students; however, among the RI students the results were more complex. Intervention groups G-*R180* (209.894), E-*LLI3* (209.741), and C-*RN* (208.378) have the highest means after the Non-RI students. Intervention Groups D-*LLI2* (207.604), A-*TC* (206.846), and B-*LLI1* (206.355), yielded slightly lower means. The iReady group, Intervention F, mean (200.128) was significantly lower than all other intervention groups.

The results for the MAP are more complex than the BAS, and there is a less-discernable pattern. G-*R180* and E-*LLI3* produced the highest adjusted means, and they are Tier 3 interventions, requiring more time and frequency than Tier 2 interventions. The third Tier 3 intervention, F-*iR*, yielded the lowest adjusted mean.

Again, Interventions C-*RN*, F-*iR*, and G-*R180*, are mostly computer-based interventions. Interventions C-*RN* and G-*R180* yielded two of the three highest means among the RI students. The data may suggest that familiarity of digital reading through computer-based interventions impact computer-based assessments; however, this is not true of Intervention F-*iR*.

Discussion of Research Question 1-BAS and MAP

Further analyses were run to determine whether the interventions at each tier were effective. Considering that the Response to Intervention (RTI) model functions as a fluid continuum of which students can enter and exit tiers based on needs, data at each tier must be "collected and precise as students' progress through the tiers of intervention" (Burns & Riley-Tillman, 2009, p. 134). There was a significant increase in reading growth for students in all three tiers. Tier 3 students experienced less of an increase in reading growth compared to Tier 2 and Tier 1 students, as measured by the BAS; however, the increase in reading growth for Tier 3 students was larger than Tier 2 and Tier 1 students when using the MAP assessment as the covariate.

The LLI program was used for three intervention groups, but the time and frequency varied for the three groups. The effects for reading growth for all three intervention programs were highly significant. Intervention Groups D-*LLI2* and E-*LLI3* involved a hybrid of replacement and supplemental instruction and produced slightly higher results compared to Intervention B-*LLI1*, which was implemented strictly as supplemental instruction. Intervention Group E-*LLI3* students were given 60 minutes of replacement instruction daily, twice the amount of replacement instruction as Intervention Group D-*LLI2*, which was a Tier 2 group.

Non-RI students were included in this study to compare growth with RI students. Non-RI students showed significant gains on the BAS (t=51.004) and MAP (t=23.465), which were similar to RI students. *T*-scores were significantly higher due to the large number of RI students. Similar gains were made by Non-RI students compared to RI students. One may suggest that the specific interventions were not effective since the gains in reading growth were not producing greater gains than Non-RI students, and that the adjusted means for Non-RI students were higher than RI students; however, this was a nonexperimental study where students were placed in

intervention groups due to previously identified reading difficulties and disabilities. Therefore, it would be more reasonable to argue that the interventions are effective as students showed reading growth similar to Non-RI students despite reading challenges and needs. Additionally, when grouped by RTI tiers, students in Tier 2 made similar gains to Non-RI students using both assessment measures. Tier 3 students made larger gains than Non-RI students when grouping them together and using the MAP as a covariate. It is reasonable and fair to say that the interventions were effective because the reading gap was not increasing between Non-RI students and RI students despite reading needs of RI students.

Non-RI students experienced similar or greater gains in reading ability than RI students as measured by the BAS and MAP when measured against each intervention group. It would be short-sighted to believe the RI students would have made greater growth in reading ability absent of a reading intervention. Students with identified reading needs are placed in reading intervention programs due to data suggesting the need for supports. It can be argued that if these students did not receive the additional reading support through interventions, they would not have experienced as much growth as they did based on historical data.

Discussion of Research Question 2

Research question two addressed the differences in reading growth based on socioeconomic status (SES), gender, and grade level. Despite efforts to create more equitable achievement outcomes for factors such as grade level, gender, and SES, schools still show discrepant numbers that have maintained an achievement gap among students.

A two-factor repeated measures analysis of variance was used to examine reading growth by grade level, and determine if there was a significant difference in reading growth by grade

level. All grade levels demonstrated significant reading growth as measured by the MAP and the BAS; however, second grade students demonstrated significantly more reading growth than the students in grades three, four, and five as measured by the MAP and BAS with a large effect size (MAP- .162; BAS- .142). Differences between other grade levels were not significant.

Intermediate and upper elementary teachers read aloud less often than teachers in the primary elementary years. They also expect students to read silently more often opposed to reading aloud for the teacher to hear and provide feedback. Explicit modeling and instruction is necessary for young readers to develop, while students in later elementary grades are expected to develop more independency. According to research, explicit modeling and explaining fosters greater improvement and competency in reading skills (Allington et al., 2001). Second grade teachers provide more explicit modeling in literacy skills than teachers in intermediate and upper elementary grade levels.

Studies have shown that gender has played a role in reading achievement; females tend to outperform males in reading across the world. In the 2006 Progress of International Reading Literacy Study, fourth grade females significantly outperformed males in 38 of 40 countries (Lubienski & Robinson, 2011). A number of studies suggest a gender gap in reading achievement and literacy skills as girls consistently outperform boys (Asbrock, Retelsdorf, & Schwartz, K., 2015; Lubeinski & Robinson, 2014). The same analyses were run for gender as for grade level, a two-factor, repeated measures analysis of variance. In this study, in both the BAS and MAP there was a significant main effect for gender. Girls scored higher than boys in both the BAS and MAP assessments in the initial and final assessments; however, the interaction was not statistically significant as girls did not make significantly more reading growth than the boys. Girls did not respond better to the interventions than boys.

SES has been found to be a powerful predictor of reading achievement (Tajalli & Opheim, 2004). SES has also been a major predictor for academic success overall; low SES has been noted as the main factor for students not realizing their academic achievement (Bog, Dietrichson, Filges, & Klint Jorgensen, 2017). Analyses were run for SES as a variable in this study to determine if students identified as low SES responded better or worse to reading interventions than students who were not identified as low SES.

The percentage of students participating in the free and reduced lunch program at the participating school was used to determine SES. Students receiving free or reduced lunch were identified as low SES students. For both BAS and MAP there was a significant main effect for SES. Students who are socioeconomically disadvantaged, or low SES, scored lower in both the BAS and MAP assessments on the initial and final assessments. It is not surprising that students with lower SES have lower means in reading performance than their peers based on previous research; however, the interaction for SES and the interventions was not statistically significant. Low SES students did not respond differently to the reading interventions compared to students who are not socioeconomically disadvantaged.

Discussion of Research Question 3

The third research question addresses students' general self-perception as readers. The RSPS was used to measure students' self-perception across intervention groups and Non-RI students. There was a significant effect for intervention; however, there was no significant main effect across intervention groups. There was no significant difference in self-perception as readers between RI students. There was, however, a significant main effect between Non-RI and RI students in four of the intervention groups. There was a higher mean for Non-RI students than

all intervention groups. The mean for self-perception of Non-RI students was statistically significant compared to the RI students in intervention groups A-*TC*, B-*LLI1*, D-*LLI2*, and E-*LLI3*. RI students do not perceive their reading ability to be as high as Non-RI students. Self-perceptions did not differ from groups C-RN, F-iR, and G-R180, which are mainly computer-based programs, and involve less teacher interaction that the other interventions.

Consistent findings were revealed when students were grouped by RTI tiers. Students in Tier 1 did not participate in a reading intervention program and they perceive themselves as better readers than students who did- those students in Tiers 2 and 3. Students' self-perception as readers were higher in Tier 2 intervention groups compared to students in Tier 3; however, the difference is not significant. Overall, students who struggle with reading and receive interventions recognize that they have difficulties with reading and have the perception that their abilities are not as strong as their peers who do not receive reading interventions.

Limitations

Sample-size for Non-RI students and each intervention group varied based on students' needs and the level of support needed. The results, therefore, were impacted by the discrepancy in number of participants in intervention groups in this study. The majority of students in the study did not receive additional reading support through a reading intervention. Most RI students participated in Tier 2 interventions opposed to Tier 3 interventions. Non-RI showed similar reading growth to students in Tier 2. Tier 2 RI students showed greater reading growth than students in Tier 3 when measured by the BAS. Tier 3 students experienced greater increases in reading growth when measured by the MAP. It is essential to note that the RTI process functions

as a continuum. Students are placed in intervention groups based on their needs along the continuum. The difference between tiers and interventions is frequency, time, and appropriateness for students' needs.

This study should be replicated with other populations of students and different settings to be generalizable. Analyzing the effectiveness of reading intervention programs in more schools will add to the findings of this study, particularly in schools in which there are more students in Tier 3 intervention programs.

Program fidelity was a limitation for this study. Intervention A-TC did not include a particular program, but requires the expertise of a veteran reading specialist. Three intervention groups use the LLI program; however, scheduling confines created challenges for the program to be delivered with the prescribed specificity. Studies that take place in authentic school settings include transition time, student absences, snow days, etc. Fountas and Pinnell suggest that second grade students receive 30 minutes of daily instruction with a teacher-to-student ratio of 1:3. Students in grades 3-5 should receive 45 minutes of daily instruction with a maximum of four students per group (Fountas & Pinnell, 2017). Most student groups included a maximum of four students per group; however, a few intervention groups ranged from 3-6 students in this study. Decreasing the teacher-student ratio would result in fewer students receiving interventions despite the need for reading support, or an increase in personnel. While one could argue that the fidelity of program implementation is essential to effectiveness, the analyses of this study is important for school leaders. This study is realistic and an authentic problem that school leaders face with time, scheduling, and budgetary constraints. Program fidelity is the goal for any intervention, but schools are dynamic, and school leaders must often be creative with implementation and scheduling.

Recommendations

Students using the Read Naturally program showed significant growth in both assessment measures. Intervention Group C-*RN* had the third-highest adjusted mean for the BAS and the second highest adjusted mean for the MAP. The Read Naturally program is mainly computer-based, and does not require a significant amount of instruction or expertise from a teacher. Additionally, the program is web-based and more students can be included in the intervention if computers or laptops are available. Intervention groups do not have to be limited to groups of three or four students as suggested for the Leveled Literacy Intervention (LLI) program. The Read Naturally program is advantageous to school leaders as an intervention program due to the ability to provide more students with support and not requiring extensive expertise in literacy. While the Read Naturally program is not comprehensive enough to use as an exclusive intervention program, it should be included as a Tier 2 intervention in elementary schools as a supplementary reading program.

Students using the LLI program showed consistent results. Students showed increased reading growth consistent with students who were not identified with reading needs. While the delivery of the program requires a highly qualified teacher trained in the program, the students are able to receive direct, small-group instruction of complex texts. It is recommended that this program be used for students who need intensive support and require supplemental or replacement instruction.

Multiple reading intervention programs are purchased and implemented without using the research-based, suggested model. It is recommended to restructure the schedule and allocate

personnel and resources in order to deliver the interventions with greater fidelity, or schools should research interventions that can be implemented with the current structure of the school. The current structure does not allow for some of the interventions to be delivered with fidelity.

The data showed that low SES students have lower reading abilities than students who do not participate in the free and reduced lunch program. Their reading abilities are lower at the beginning of the year and at the end of the year. Another recommendation is to provide resources and opportunities for low SES families to build reading skills at an earlier age through community outreach. The district's kindergarten program is a half-day program. Extended-day opportunities are available through a local youth program, but many parents and guardians are unable to take advantage of the program for financial reasons and a limited number of spaces within the program. The school district should consider reallocating funds to purchase space in the program. Reserving spaces and providing scholarships for the program for low SES students will provide more learning opportunities, and will likely be advantageous to increase basic reading skills in order to close the reading gap.

RI students do not believe that their reading abilities are as strong as Non-RI students. The data measured by the BAS and MAP suggest that their perceptions of their reading abilities to be accurate; however, the goal of educators is to help students to become successful, independent, and confident. Students who do not feel confident in their reading abilities at the elementary level will likely feel unconfident in their reading abilities at the middle school and high school level. Teachers must stimulate critical thinking, provide specific and timely feedback, and increase reading ability in order to increase self-efficacy and help students build confidence in their reading abilities.

Particularly interesting in this study was that self-perceptions of Non-RI students did not differ from the Read 180 (R180), iReady (iR), and Read Naturally (RN) student groups, but did differ from the Teacher-Created (TC), and all three Leveled Literacy Intervention (LLI) groups. This is of interest because the R180, iR, and RN interventions are mainly computer-based, while the TC and LLI groups require direct instruction from a teacher. Struggling readers working with teachers have lower self-perceptions as readers than struggling readers receiving interventions that are computer-based. A potential reason for this is because teachers working with students in the TC and LLI groups are explicitly stating what skill deficits the students have directly to them in an effort to be transparent and clear about areas that are needed to improve reading ability. This leads students to have a greater awareness of reading strengths and needs.

Summary

This research study extended the literature in the area of the impact of reading interventions and complements the growing body of literature specific to literacy growth of students with reading needs. The results of this study aided in advancing scientific knowledge by extending knowledge about reading education at the local level. This research assisted in further conceptual understanding of elementary students' reading growth and to answer relevant questions as they pertain to reading interventions.

This study was designed to analyze the effectiveness of reading intervention programs by measuring students' reading growth, and assist school leaders in the decision-making process for purchasing and implementing reading intervention programs. The findings show that RI students made significant reading gains; however, two assessment measures indicated that RI students did

not make more growth in reading ability than Non-RI students when grouped by interventions. The LLI, Read Naturally, and teacher-created interventions yielded highly significant gains using both assessment measures. The Read 180 program showed significant gains in one measure, and the students in the iReady program did not demonstrate significant gains compared to the other interventions.

There were no significant interactions for gender and SES as a result of the interventions in this study. Further analysis should be completed to determine how this school fosters equitable support and achievement across genders and SES. Students' self-perceptions as readers are lower among RI students compared to Non-RI students. Students' self-perceptions did not differ among intervention programs.

School leaders must choose carefully when implementing intervention programs, and create a structure to effectively implement the interventions. Leaders must analyze the intervention programs used in their schools, and determine effectiveness, recognizing that increasing the "dose" does not necessarily correlate to increased reading growth. This is demonstrated by the intervention groups using the LLI program and the differences in reading increases among the intervention programs. This research is applicable to any school setting, as well as under the strict auspices of professional research as a way to deepen knowledge and understanding in terms of reading interventions. Increasing knowledge and understanding about intervention programs will be a catalyst for school leaders to make progress towards closing the achievement gap.

School leaders must be aware of the self-perceptions of struggling readers. Students are aware that they have skill deficits and it is affecting their confidence. School leaders must find

ways to increase confidence and self-perceptions of readers who are not meeting grade level expectations in reading.

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APPENDIX

READER SELF-PERCEPTION SCALE

Listed below are statements about reading. Please read each statement carefully. Then circle the letters that show how much you agree or disagree with the statement. Use the following scale:

SA = Strongly Agree A = Agree U = Undecided D = Disagree SD = Strongly Disagree

Example: **I think pizza with pepperoni is the best.**		SA	A	U	D	SD
If you are *really positive* that pepperoni is the best, circle SA (Strongly Agree).						
If you *think* that it is good but maybe not great, circle A (Agree).						
If you *can't decide* whether or not it is best, circle U (Undecided).						
If you *think* that pepperoni pizza is not all that good, circle D (Disagree).						
If you are *really positive* that pepperoni pizza is not very good, circle SD (Strongly Disagree).						
	1. I think I am a good reader.	SA	A	U	D	SD
[SF]	2. I can tell my teacher likes to listen to me read.	SA	A	U	D	SD
[SF]	3. My teacher thinks my reading is fine.	SA	A	U	D	SD
[OC]	4. I read faster than other kids.	SA	A	U	D	SD
[PS]	5. I like to read aloud.	SA	A	U	D	SD
[OC]	6. When I read, I can figure out words better than others.	SA	A	U	D	SD
[SF]	7. My classmates like to listen to me read.	SA	A	U	D	SD
[PS]	8. I feel good inside when I read.	SA	A	U	D	SD
[SF]	9. My classmates think I read pretty well.	SA	A	U	D	SD
[PR]	10. When I read, I don't have to try as hard as I used to.	SA	A	U	D	SD
[OC]	11. I seem to know more words than others when I read.	SA	A	U	D	SD
[SF]	12. People in my family think I am a good reader.	SA	A	U	D	SD
[PR]	13. I am getting better at reading.	SA	A	U	D	SD
[OC]	14. I understand what I read as well as other kids do.	SA	A	U	D	SD
[PR]	15. When I read, I need less help than I used to.	SA	A	U	D	SD
[PS]	16. Reading makes me feel happy inside.	SA	A	U	D	SD
[SF]	17. My teacher thinks I am a good reader.	SA	A	U	D	SD
[PR]	18. Reading is easier for me than it used to be.	SA	A	U	D	SD
[PR]	19. I read faster than I could before.	SA	A	U	D	SD
[OC]	20. I read better than other kids in my class.	SA	A	U	D	SD
[PS]	21. I feel calm when I read.	SA	A	U	D	SD
[OC]	22. I read more than other kids.	SA	A	U	D	SD
[PR]	23. I understand what I read better than I could before.	SA	A	U	D	SD
[PR]	24. I can figure out words better than I could before.	SA	A	U	D	SD
[PS]	25. I feel comfortable when I read.	SA	A	U	D	SD
[PS]	26. I think reading is relaxing.	SA	A	U	D	SD
[PR]	27. I read better now than I could before.	SA	A	U	D	SD
[PR]	28. When I read, I recognize more words than I used to.	SA	A	U	D	SD
[PS]	29. Reading makes me feel good.	SA	A	U	D	SD
[SF]	30. Other kids think I am a good reader.	SA	A	U	D	SD
[SF]	31. People in my family think I read pretty well.	SA	A	U	D	SD
[PS]	32. I enjoy reading.	SA	A	U	D	SD
[SF]	33. People in my family like to listen to me read.	SA	A	U	D	SD

SCORING SHEET

Student Name _____

Teacher _____

Grade _____ Date _____

Scoring key: 5 = Strongly Agree (SA)
4 = Agree (A)
3 = Undecided (U)
2 = Disagree (D)
1 = Strongly Disagree (SD)

Scales

General Perception	Progress	Observational Comparison	Social Feedback	Physiological States
1. _____	10. _____	4. _____	2. _____	5. _____
	13. _____	6. _____	3. _____	8. _____
	15. _____	11. _____	7. _____	16. _____
	18. _____	14. _____	9. _____	21. _____
	19. _____	20. _____	12. _____	25. _____
	23. _____	22. _____	17. _____	26. _____
	24. _____		30. _____	29. _____
	27. _____		31. _____	32. _____
	28. _____		33. _____	
Raw Score	_____ of 45	_____ of 30	_____ of 45	_____ of 40

Score interpretation

High	44+	26+	38+	37+
Average	39	21	33	31
Low	34	16	27	25