

2017

# The Effects of Leveled Literacy Intervention for Students in the RtI Process

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*Walden University*

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# Walden University

College of Education

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Lisa Taylor

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2017

Abstract

The Effects of Leveled Literacy Intervention for Students in the RtI Process

by

Lisa Taylor

MA, Winthrop University, 2000

BS, Winthrop University, 1996

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

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August 2017

## Abstract

Low reading skills constitute a serious achievement problem. Although there are remedial support in schools, between 2% and 6% of the student population continues to show persistent reading difficulties despite intensive intervention. The research problem in this study addressed the lack of effective reading interventions for students who were in Tier III of the Response to Intervention (RtI) process. Piaget's cognitive development theory, constructivism, and Vygotsky's zone of proximal development theory made up the theoretical framework. The purpose of this quantitative study was to determine the effects of *Fountas and Pinnell's Leveled Literacy Intervention (LLI)* on reading achievement of students in Grades 2-5. Reading achievement was measured using *Fountas and Pinnell's Benchmark Assessment System (BAS)* and *Measures of Academic Progress (MAP)* assessments. A quasi-experimental design was utilized to compare pre- and post- intervention data for students in Grades 2-5 who did or did not receive LLI instruction and were in Tier III of the RtI process. The sampling size was determined by the number of students who scored below the grade level expectation on the Fall 2015 BAS and MAP assessments. The experimental group consisted of 72 students and the control group consisted of 64 students. Data were collected and analyzed using ANCOVA. The pretest was treated as a covariate. The results of this study showed reading achievement scores were significantly higher for the experimental group on both posttests. This study contributed to positive social change by improving the welfare of students by increasing their reading achievement.

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## Dedication

This study is dedicated to my husband, Creighton, and son, Cole, who know firsthand of the time, work, dedication, and sacrifice that went into this research study.

This study is also dedicated to my father, Alvin, and the memory of my mother, Carol, who always believed in me.

“All that I am or ever hope to be I owe to my angel mother.”

~ Abraham Lincoln

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I would be remiss if I did not mention Alisha for her guidance and my study buddies Bailey and Natasha who have been with me since the beginning of this journey. Thank you all for helping me reach this milestone.

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## Chapter 1: Introduction to the Study

The focus of this study was reading. In particular, the present study examined the effects of *Fountas and Pinnell's Leveled Literacy Intervention (LLI)* that incorporates Guided Reading instruction and the effect of LLI on the reading achievement of students in the Response to Intervention (RtI) process. Reading is fundamental for educational success and independence later in life (Blachman et al., 2014; Holmes, Reid, & Dowker, 2012; Hulme & Snowling, 2011; Solis et al., 2012). On the other hand, failure to read has been shown to have serious consequences. Students who struggle with reading and are not given additional support have displayed long-term poor academic achievement, lower motivation to read, dis-engagement with the learning process, behavior problems, reduced employment opportunities, and the possibility of being socially excluded (Holmes et al., 2012). However, the support structures that are currently in place for struggling readers have shown to make “little to no progress” (Blachman et al., p. 47), while early intervention can significantly decrease the number of students with reading difficulties (Partanen & Siegel, 2014). The results of this study contributed to positive social change by improving students' welfare by increasing their reading achievement.

Chapter 1 is divided into nine major sections. These sections include: (a) problem statement, (b) purpose of the study, (c) research question and hypotheses, (d) theoretical framework, (e) nature of the study, (f) definitions, (g) assumptions, (h) scope and delimitations, (i) limitations, and (j) significance. These components provide a preview to the current study.

## **Background**

### ***The No Child Left Behind Act of 2001***

The *No Child Left Behind Act* (NCLB) of 2001 was signed into law by United States' President Bush on January 8, 2002 (Hursh, 2007; Reynolds, Wheldall, & Madeline, 2011). This legislation was a reauthorization of the Elementary and Secondary Education Act (ESEA) of 1965 which is a federal civil rights statute at its core, designed to provide equality of educational opportunity to poor and minority children (Hursh, 2007; Davidson, Reback, Rockoff, & Schwarts, 2015). The NCLB has been implemented as an educational reform to further civil rights principles such as inclusion and equal opportunity (Davidson et al., 2015; Hursh, 2007). In order to provide equitable educational opportunities to all students, the NCLB allows for Title I provisions to be applied to disadvantaged students (Reynolds et al., 2011). The legislation scaled up the federal role in holding schools accountable for student outcomes. Specifically, the NCLB put a special focus on ensuring that states and schools boost performance of certain groups of students, such as English-language learners, students in special education, students from low socioeconomic backgrounds, and minority children, whose achievement typically trails their peers (Davidson et al., 2015). The NCLB initiative assisted schools and districts in the effort to overcome reading failure in K-3 classrooms (Reynolds et al., 2011). Having all students reach proficient or advanced levels of state academic standards in reading is one of the central goals of NCLB. There are four guiding principles to NCLB: accountability, flexibility in the use of funding, research based reforms, and respect for parental choice (Davidson et al., 2015; Sclafani, 2003).

While all four of these guiding principles are intertwined and equally important in the essence of the legislation, this study focused on the guiding principle of research based reforms. It is from this principle that the majority of reading programs and initiatives in reading instruction are derived (Davidson et al., 2015). NCLB mandated the use of scientifically research based practices for all reading instruction and remediation.

*Scientifically research based* was defined by the NCLB Act as:

- (a) applies rigorous, systematic, and objective procedures to obtain valid knowledge relevant to reading development, reading instruction, and reading difficulties; and (b) includes research that —
- (i) employs systematic, empirical methods that draw on observation or experiment;
- (ii) involves rigorous data analyses that are adequate to test the stated hypotheses and justify the general conclusions drawn;
- (iii) relies on measurements or observational methods that provide valid data across evaluators and observers and across multiple measurements and observations; and
- (iv) has been accepted by a peer-reviewed journal or approved by a panel of independent experts through a comparably rigorous, objective, and scientific review (NCLB, 2002, Sec. 1208).

In sum, the NCLB mandated instructional practices that have been supported by research that includes methodological rigor such as with random controlled trials and have been published in peer-reviewed professional journals.

Federal funding is contingent upon performance on standardized achievement tests (Duckworth, Quinn, & Tsukayama, 2012). The NCLB legislation added accountability through Adequate Yearly Progress (AYP) (Duckworth et al., 2012). AYP is the way in which every public school and district in the United States is evaluated based on student performance on standardized assessments (Duckworth et al., 2012).

Therefore, an effective progress monitoring system needs to be in place in order to monitor and assess the reading progress of students and address any learning deficiencies. Diagnostic and formative assessments are typically used to monitor student progress (Buffum, Mattos, and Weber, 2012). Diagnostic assessments tend to target specific skills whereas formative assessments are a process for teachers to use during instruction in order to adjust on-going teaching and learning for the improvement of student achievement and outcomes (Afflerbach, 2016). Both diagnostic and formative assessments can help improve student performance on summative or high-stakes testing. Following a brief preview of the *Every Student Succeeds Act of 2015* (ESSA), the latest reauthorization of the ESEA, will be a description of how both the NCLB and ESSA mandate of stringent assessment procedures and scientifically based reading practices intertwine with another legislation that pertains to a particular subgroup of the student population; students with disabilities.

### ***The Every Student Succeeds Act of 2015***

President Obama signed into law the ESSA on December 10, 2015. This bipartisan legislation reauthorized the 50-year-old ESEA, which is the national education law and longstanding commitment to equal opportunity for all students (United States Department of Education, 2016). The NCLB of 2001 was the previous version of the ESEA. Much like the NCLB, the ESSA emphasized the use of scientifically research based practices where subgroups (i.e., English-language learners, students in special education, students from low socioeconomic backgrounds, and minority children) of students are struggling. Since the present study focused on the principle of research

based reforms this new reauthorization of the ESEA and NCLB help demonstrate the continued need for the current study.

### ***The Individuals with Disabilities Education Act of 2004***

The *Individuals with Disabilities Education Act* (IDEA) of 1997 was reauthorized as the *Individuals with Disabilities Education Improvement Act* of 2004 (McCleary, Rowlette, Pelchar, & Bain, 2013; Smith, 2005). This legislation mandated a research based approach to intervention and identification of students with learning disabilities (McCleary et al., 2013). This new approach allows the use of a student's response to evidence-based instruction as a formal part of the disability identification process instead of relying primarily on IQ achievement discrepancy (Fuchs, Fuchs, & Compton, 2012; Scammacca, Roberts, Vaughn, & Stuebing, 2013). With this new approach to identification came a system of multitiered support such as RtI (McCleary et al., 2013). RtI became a legal alternate to the IQ discrepancy approach for identifying students with learning disabilities with the reauthorization of IDEA in 2004 (Gilbert et al., 2013; Toste et al., 2014). While RtI is a way to prevent the over identification of students with a Specific Learning Disability (SLD) as well as identify students who need intensive intervention (Gilbert et al., 2013; Toste et al., 2014), the primary purpose of IDEA is to provide a Free Appropriate Public Education (FAPE) for all students with disabilities (McCleary et al., 2013; Smith, 2005). A description of RtI is provided in the following section.



## **Response to Intervention**

Response to intervention has been described as “a seismic shift in school culture, structure, and practice” (Buffum et al., 2012, p. 87). It is a multitier approach modeled after those developed in mental health and medicine where the tiers increase with intensity and are centered on the assumption that early intervention prior to the onset of significant problems will lead to a developmental trajectory associated with positive long term outcomes (Gilbert et al., 2013). Buffum et al. (2012) described RtI as a way to provide every student with additional time and assistance needed to learn at high levels. Most RtI programs consists of three tiers of support (Buckingham, Wheldall, & Beaman-Wheldall, 2014; Buffum et al., 2012). Tier I represents the basic instruction that all students receive, which is grade-level core instruction (Buckingham et al., 2014; Buffum et al., 2012). Tier II is for students who have demonstrated a need for increasingly more targeted intensive support (Buckingham et al., 2014; Buffum et al. 2012). Tier II consists of supplemental interventions conducted inside the general education classroom. Tier III is for students who need intensive support and is conducted through a pull-out program generally outside of the general education classroom environment (Buckingham et al., 2014; Buffum et al., 2012). In typical Special Education practices students who do not adequately respond to the intensive interventions receive a referral for a comprehensive evaluation for eligibility for Special Education services (O’Connor, Bocian, Beach, Sanchez, & Flynn, 2013).

There are five core components essential for an RtI model. These five components are universal screening, a high quality core reading program, progress

monitoring, increasingly intensive tiers of intervention, and fidelity of implementation (Coyne, Simmons, Hagan-Burke, et al., 2013; Gersten et al., 2009; Greulich et al., 2014). The methods employed in an RtI framework are more accurate at differentiating students who have a SLD from students whose difficulties could be remediated with scientifically based interventions within general education (McClearly et al., 2013; United States Department of Education, 2007).

### **Evidence-Based Practices**

The recent educational reform and polices found in the NCLB, ESSA, and IDEA of 2004 require the use of Evidence-Based Practices (EBPs) that have a history of proven effectiveness (Solis et al., 2012). The medical field was the first to implement EBPs (Gilbert et al., 2013) and EBPs were adopted in the education field with NCLB of 2001. Evidence-based practices can be defined as an instructional strategy, intervention, or teaching program that has resulted in consistent positive results when experimentally tested (Cook & Cook, 2013; Mesibov & Shea, 2011). Cook and Cook (2013) explained how EBPs must consist of operationally defined sets of procedures such as the target population, context, interventionist, and outcomes.

In order for an intervention to be considered an EBP the implementation of high quality research is needed (Odom, Collet-Klingenberg, Rogers, & Hatton, 2010). High quality research has been defined as research that incorporates experimental, quasi-experimental, or single subject research design; is replicated numerous times, and is published in peer-reviewed professional journals (Boutot & Myles, 2011; Cook & Cook,

2013; Snowling & Hulme, 2011). These types of studies are considered high quality research because they help determine if a change in the dependent variable was caused by the independent variable rather than by chance (Cook & Cook, 2013). High quality research is the hallmark of EBPs. In sum, experimental, quasi-experimental, and single subject designs meet quality indicators indicating methodological rigor. The gold standard for determining EBPs includes four fundamental issues: research design, quality of research, quantity of research, and magnitude of the effect of supporting studies (Cook & Cook, 2013). Boutot and Myles (2011) discussed evidence that is not considered part of an EBP which include anecdotal reports, case studies, and publication in nonrefereed journals, magazines, internet, and other media news outlets. EBPs have the potential to elicit meaningful positive change in education by providing the most effective instruction to students who are at-risk for school failure to reach their full potential.

Implementing effective reading interventions within a multitiered support system like RtI is the gap in Special Education practice the present study addressed. Researchers such as Allington (2013) and Cook and Cook (2013) have argued that what research findings indicate as effective instructional practices are not being implemented into daily classroom practice. This is due in part to teachers preferring to rely on more personal sources for determining what and how to teach. According to Cook and Cook educators have traditionally “used sources such as personal experience, tradition, and expert opinion to discern what works in the classroom” (p. 71). Cook and Cook further explained how many educational practitioners simply mistrust research. A more detailed description of the evidence of the problem is provided in the next chapter.

This study was needed because there have been relatively few studies examining response to Tier III interventions within multitiered models like RtI (Fuchs & Vaughn, 2012; Greulich et al., 2014; Lam & McMaster, 2014; Wanzek & Roberts, 2012). Results from this study helped provide opportunities for stakeholders to engage in scholarly dialogue about effective reading practices and interventions for struggling readers which could help shape, improve, or change educational policy.

### **Problem Statement**

Even though there are numerous interventions to help increase reading achievement, students who do not read proficiently at grade level continue to have reading difficulties (Buckingham et al., 2014; Fuchs, Fuchs, & Vaughn, 2014; Vaughn, Wexler, & Leroux, 2012). Research indicates that identifying effective research based interventions within a multitier system of support like RtI is a significant problem in Special Education practice and should be addressed (Buckingham et al., 2014; Reynolds et al., 2011; Swanson et al., 2012). There has been considerable debate regarding the efficacy of documented, evidence-based intervention practices (Blachman et al., 2014; Partanen & Siegel, 2014; Vaughn, Wexler, & Leroux, 2012; Wanzek et al., 2013). In addition to the debate regarding the efficacy of evidence-based intervention practices, Compton et al. (2014) argued that interventions and instruction have not eradicated poor reading. Instead, the authors suggested that researchers have inadvertently diluted reading theory in ways that compromise the efficacy of intervention programs (Compton et al., 2014). Compton et al. argued that current reading interventions incorporate instruction that is a knowledge level below what is needed to strengthen reading skills

that are generative in students with a Reading Disability (RD). The authors also contended that reading interventions fail to imitate and foster inductive learning techniques which portray typical reading development. According to Cain and Parrila (2014), the diluting of reading theory has produced interventions that are fast and easy to implement but are not sufficiently robust to change the long-term effects for students with difficulties. RtI is designed to provide early intervention to students deemed at-risk for school failure and to develop a more structured procedure for identifying students with reading disabilities (O'Connor et al., 2013; Swanson et al., 2012). Fletcher, Lyon, Fuchs, and Barns (2006) along with Bradley and Greene (2013) reported that students with low reading achievement constitute a serious public health problem. Connor, Alberto, Compton, and O'Connor (2014) reported that students with reading difficulties are at-risk for school failure, becoming teen parents, and being placed in the juvenile justice system. Reading impacts academic success along with students' emotional and social development throughout life (Bradley & Greene, 2013).

### **Purpose of the Study**

The purpose of this study was to determine the effects of LLI on reading achievement of students in grades 2-5 who did or did not receive LLI instruction. Quantitative methods were used to address the research problem. The independent variable for this study was LLI. The dependent variable for this study was reading achievement determined by the pretest and posttest reading scores from the *Fountas and Pinnell's Benchmark Assessment System (BAS)* and *Measures of Academic Progress (MAP)* assessments of students in grades 2-5 who were in Tier III of the RtI process. The

pretest and posttest reading scores of students in grades 2-5 who did or did not receive LLI instruction were examined in order to determine the effect size of LLI on reading achievement.

### **Research Question and Hypotheses**

#### **Research Question**

RQ: What are the effects of LLI on the reading scores of second-fifth grade students who receive LLI supplemental intervention support in a pull-out setting?

#### **Hypotheses**

H<sub>0</sub>: There is no significant difference between the reading scores of second-fifth grade students who receive LLI instruction and the reading scores of second-fifth grade students who do not receive LLI instruction as measured by the BAS and MAP assessments.

H<sub>1</sub>: There is a significant difference between the reading scores of second-fifth grade students who receive LLI instruction and the reading scores of second-fifth grade students who do not receive LLI instruction as measured by the BAS and MAP assessments.

### **Theoretical Framework of the Study**

The overarching philosophical framework for this educational research was the advocacy framework. According to Lodico, Spaulding, and Voegtle (2010), the researcher strives to educate and produce knowledge as well as empower people to take political action to make changes in their society within an advocacy framework. Data

from this quantitative study helped achieve positive social change for struggling readers by improving student outcomes.

Cognitive development theory, constructivism, and Vygotsky's zone of proximal development also informed this quantitative study. Cognitive development theory is where an internal self-regulating mechanism operates through two complementary biological processes: assimilation and accommodation (Piaget, 1964). From this theory came constructivism which is the assertion that knowledge is built upon prior learning experiences (Piaget, 1964). According to Piaget (1964), an individual's background helps to shape and internalize new knowledge. Vygotsky's (1978) zone of proximal development is centered on the amount of scaffolding an individual needs to perform a task independently. During LLI instruction which incorporates Guided Reading, students construct new knowledge from prior knowledge by thinking actively while reading in order to generate meaning. (Fountas & Pinnell, 2001). A more detailed explanation of cognitive development theory, constructivism and Vygotsky's zone of proximal development is provided in Chapter 2.

### **Nature of the Study**

The nature of this study was a quantitative inquiry. Quantitative methods analyze data using tests of significance (Creswell, 2012). In order to determine the effect size of LLI on reading achievement of students in grades 2-5 who were in Tier III of the RtI process a quasi-experimental pretest and posttest design was employed. According to Creswell (2012), researchers utilize a quasi-experimental pretest and posttest design when there is a need to use intact groups for the purpose of comparing scores of different

treatments between groups. This was my rationale for employing a quasi-experimental pretest and posttest design. For the present study, the interest was the extent to which receiving or not receiving LLI instruction over time (within- subject factors) affects reading scores of second-fifth grade students (between subject factors). The approach that was taken was to compare the difference through a pretest and posttest of two intact groups (students who received LLI instruction [experimental] and students who did not receive LLI instruction [control]). According to Creswell (2012), quasi-experimental studies utilize intact groups when random assignment may not be possible such as with educational settings. The quasi-experimental pretest and posttest design derives logically from the problem because it is a type of between-group design that is frequently used in education where intact groups are utilized rather than random assignment. Reading achievement was measured by the BAS and MAP. In the pretest and posttest design, after the experimental treatment, a posttest is administered in order to assess the difference between the reading scores of both the control and experimental group. Therefore, the quasi-experimental pretest and posttest design was appropriate with regard to the research question and hypotheses. The Analysis of Covariance (ANCOVA) was the statistical test that was used to compare pretest and posttest reading scores of students in Grades 2-5 who did or did not receive LLI instruction in order to determine the effect size of LLI.

### **Definitions**

*Academic Achievement:* academic achievement is defines as “the achievement by individuals of objectives related to various types of knowledge and skills” (International Observatory on Academic Achievement, 2006, p. 2).



*Direct/explicit instruction:* Direct/explicit instruction is the process of imparting new information to students through meaningful teacher-student interactions and teacher guidance of student learning (Rupley, Blair & Nichols, 2009).

*Effect size:* Effect size is defined as “a means for identifying the practical strength of the conclusions about group differences or about the relationship among variables” (Creswell, 2012, p. 188).

*Guided reading:* Guided reading is the context in which teachers support students’ development of effective strategies for processing texts at increasingly challenging levels of difficulty leading to independent silent reading (Fountas & Pinnell, 1996).

*Intervention:* intervention is an evidence-based practice designed to provide remediation for an academic or behavior need (Casbarro, 2008).

*Leveled Literacy Intervention:* Leveled literacy instruction is the gradual increase of text difficulty in small increments (Clay, 1985, 1991; Pinnell, 1990).

*Reading:* Reading is the process of constructing meaning from written text for some purpose (Vellutino, Fletcher, Snowling, & Scanlon, 2004).

*Response to intervention:* Response to interventions is a means of delivering early intervention to students who demonstrate academic problems. These interventions typically target reading problems (Fuchs & Fuchs, 2006).

*Specific learning disability*: Specific learning disability a basic deficit in learning to decode print (Vellutino et al., 2004).

*Struggling readers*: Struggling readers are students who have not yet mastered the skills taught in the general education core reading lessons (Gettinger & Stoiber, 2007). These students are often at least one grade level below according to the state, district, and school's reading standards. For this study, struggling readers was defined as students in Grades 2-5 who score below the following grade level targets on the Fall 2015 MAP assessment (second-174.7; third-188.3; fourth-198.2, and fifth-205.7).

### **Assumptions**

The assumptions associated with the current study include, but are not limited to the following:

- The reading interventionists who provided the LLI instruction were well trained.
- The students in this study had not been exposed previously to LLI instruction.
- The students in this study were present during each assessment session.
- The students in this study put forth their best effort on the BAS and MAP pretest and posttest reading assessments.
- Data from the BAS and MAP reflected correct information for each assessment session and were void of any data entry errors.

## **Scope and Delimitations**

### **Scope**

The scope of the current study was the efficacy of LLI for students in Tier III of the RtI process. According to Fuchs and Vaughn (2012), there is a need to better understand what effective Tier III interventions look like. Further, Wanzek and Roberts (2012) explained how more information is needed on how to effectively increase students' reading success who are in Tier III of the RtI process. Therefore, the parameters of the current study were reading interventions for students in Tier III of the RtI process. The scope of this study did not include math achievement and student behavior. All of the participants were from one rural school district in the southeastern region of the United States.

### **Delimitations**

The first delimitation of the current study was lack of effective reading interventions for struggling readers in the RtI process. The purpose of this study was to determine the effects of LLI on reading achievement of students in Grades 2-5 who did or did not receive LLI instruction. This study did not attempt to evaluate the efficacy of Tier III interventions on math achievement scores, nor did it evaluate the effect of the RtI process on student behavior.

The participants of the current study were from one rural school district in the southeastern region of the United States. The participants were also in Grades 2-5 and in Tier III of the RtI process. The results of this study could be generalizable to students

who (a) struggle with reading, (b) attend school in the southeastern region of the United States, and (c) are in Grades 2-5 and in Tier III of the RtI process. Additionally, the sample was not randomly assigned as students were assigned to RtI based on reading scores from the Fall 2015 BAS and MAP reading assessments. Since all of the participants were from one school district, the sampling method according to Creswell (2012), was a convenience sample.

### **Limitations**

Every study has limitations. Limitations are occurrences that arise beyond the researcher's control (Creswell, 2012). Limitations to the current study were characteristics of the sample and sample size. The sample was derived from students in Grades 2-5 in one rural school district in the southeastern region of the United States. The sample size was relatively small, therefore, possibly affecting the generalizability of the study to the larger population of students in Grades 2-5 who struggle with reading. Another limitation included reading gains being attributed to outside influences such as in the home or community rather than from LLI. A final limitation was the lack of random assignment. Random assignment was not possible due to the participants being assigned to the RtI process based on individual scores on the BAS and MAP reading assessments. One way these limitations were addressed was through the statistical ANCOVA by having the pretest as a covariate.

Possible researcher biases that could have influenced the study's outcomes include inclusive bias. This type of bias is typically the result of samples selected for convenience. According to Shuttleworth (2009), samples selected for convenience tend

to fit a narrow demographic range resulting in the sample not being a full representation of the entire population. This bias was addressed by being aware that the results of the present study cannot be extrapolated to the whole population.

### **Significance**

This study examined if LLI would have a significant impact on reading achievement for students in Grades 2-5 who were in Tier III of the RtI process. The implications from this study are unique because a Reading Disability (RD) can be predicted for students who do not adequately respond to intensive interventions such as LLI (Beach & O'Connor, 2013; O'Connor et al., 2013). Effective interventions are a driving force for positive social change because such interventions address reading skills for students who do not read proficiently at grade level (Murray et al., 2014). The results of this inquiry provided much needed data on the efficacy of LLI by pinpointing the impact for students in Grades 2-5 who were in Tier III of the RtI process. Results from this study helped add to the literature about effective reading interventions used with elementary aged students who are struggling with reading.

### **Summary**

This section addressed the background or history for the study. The mandates and directives from the NCLB of 2001, ESSA of 2015, and IDEA of 2004 sparked an educational reform. This reform led to the implementation of a multitier layer of support system known as RtI. These tiers increase in intensity based on student response to the intervention. The interventions are scientifically evidence based. Students can be

identified as having a specific learning disability depending on the individual student's response to the intervention. A review of the literature will be provided in Chapter 2.

## Chapter 2: Literature Review

The purpose of the study was to determine the effects of LLI on reading achievement of students in Grades 2-5 who did or did not receive LLI instruction. In order to have a better understanding of the breadth and depth of the topic a comprehensive review of the literature was needed. An in-depth review of the literature demonstrated how this study fits with the latest research and implications for daily practice with what is known about effective reading interventions. In order to analyze scholarly thinking, a review of an exhaustive professional literature base was essential. This review included the characteristics and causes of reading difficulties among struggling readers. Once the conceptual framework has been discussed, the review will shift into the literature on key variables. While much scholarly attention has focused on early intervention reading programs for students in Grades K-3 (Blachman et al., 2014; Fuchs, Fuchs, & Vaughn, 2014; Gilbert et al., 2013), reading interventions for students in Grades 4-12 warrant further study (Vaughn & Fletcher, 2012; Vaughn, Roberts, Wexler, et al., 2015; Wanzek & Roberts, 2012; Wanzek et al., 2013), specifically in the area of reading comprehension.

The review is divided into three main sections. In the first section, the literature search strategy is discussed. The second section is the theoretical framework. The third and final section provides a review of the research related to key variables.

### **Literature Search Strategy**

The strategy that was used to acquire literature was to examine peer-reviewed articles, books, dissertations, and department of education websites. Searches for the

review spanned the years from 1964-2016 and were performed through Walden University's library database including ERIC, Educational Research Complete, EBSCO, SAGE Premier, Google Scholar, ProQuest Central, Taylor and Francis online, and PsycINFO databases. Key words used in the search included *struggling reader, early identification, persistent reading difficulties, response to intervention, reading intervention, evidence based practices, intensive reading, literacy development, guided reading, and Leveled Literacy Intervention*.

## **Theoretical Foundation**

### **Cognitive Development and Constructivism**

Piaget's (1936) theory of cognitive development was the foundational theory of the current study. According to Piaget (1964), cognitive development is comprised of the reorganization of mental processes from biological maturation and environmental experiences. Piaget believed that individuals construct their own meaning of the world around them through experience discrepancies between what they already know and what they learn in the environment while adjusting their ideas accordingly. It is this belief that constructivism is derived. Constructivism is based on the idea that individuals construct meaning by connecting new knowledge to previously learned knowledge (Piaget, 1964). Scaffolding is embedded in instruction in order to help individuals organize information (Vygotsky, 1978). Individuals may memorize information through rote learning, but will not have a true understanding of what they are learning if they are unable to connect new knowledge to old knowledge in order to construct meaning.



Cognitive learning theory and constructivism are centered on creating new knowledge from prior knowledge within two biological processes: assimilation and accommodation (Piaget, 1964). Both theories provided new knowledge of an evidence-based reading intervention for students in Tier III of the RtI process. These theories worked within the study for the participants as they learned new knowledge during the intervention. All of which are intertwined for framing the research question and analyzing and interpreting the data in order to create positive social change for students who struggle with reading.

### **Zone of Proximal Development**

Vygotsky (1978) proposed the concept of the zone of proximal development. Vygotsky defined the zone of proximal development as “the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (p. 86). This guidance will provide the individual enough assistance to complete the task and allow the new knowledge to then be incorporated into the individual’s existing knowledge base.

### **Guided Reading**

Guided Reading was the foundation for the LLI intervention that was used in the current study. According to Fountas and Pinnell (1996), guided reading is a meaning-based instructional approach where the teacher supports the development of effective strategies each student needs in order to process texts at increasingly challenging levels

of difficulty. There are essential elements of guided reading that support students before, during, and after reading.

Before reading, the teacher's role is to select an appropriate text that is supportive but has a few problems to solve (Fountas & Pinnell, 1996). The teacher also prepares an introduction to the story. Knowing the meaning, language, and visual information in the text and the knowledge, experience, and skills required of each student, the teacher then briefly introduces the story (Fountas & Pinnell, 1996). The teacher will also prepare questions to be answered throughout the reading. During this stage of instruction, students engage in a conversation about the story, ask questions, build expectations, and notice information in the text (Fountas & Pinnell, 1996). The teacher's role during reading is to listen to the students' conversation about the story while observing behaviors for evidence of strategy use and confirms students' problem solving attempts and successes (Fountas & Pinnell, 1996). Fountas and Pinnell (1996) noted that the teacher also interacts with individual students to assist with problem solving attempts when needed along with making notes about the strategy use of individual students. Students read the whole text or part of the text either silently or orally to themselves and request help with problem solving when needed (Fountas & Pinnell, 1996). After reading the teacher talks with the students about the story and invites personal response. According to Fountas and Pinnell, the teacher returns to the story for teachable opportunities as in finding evidence or discussing problem solving. The teacher also assesses the students for comprehension of the text and possibly offers an extension to the story through activities such as drama, writing, art, or additional reading. Students will

talk about the story after reading as well as check predictions and react personally to the story.

Although students may enter upper elementary grades with good decoding skills, the emphasis shifts from phonics to meaning. This is to say that students may be able to read words, but according to Fountas and Pinnell (2001), there is a difference between calling words and reading with understanding. Clay (1991) explained how, for older students, meaning is the most important source of information. Fountas and Pinnell discussed how older students need to “learn how to organize their knowledge in order to summarize or draw inferences from increasingly difficult texts” (p. 191). Therefore, explicit and systematic teaching of phonics is not recommended in the reading instruction for older students. According to Fountas and Pinnell, the teaching of phonics is not recommended because students are exposed to high quality children’s literature where making meaning is paramount to decoding. Clay explained how students who read texts are exposed to learning letters, sounds, and words all throughout their reading experience. Clay further explained that students taught through Guided Reading learn to read as they “integrate all language systems simultaneously, semantic, syntactic, and orthographic” (p. 94) even though making meaning is the ultimate goal.

Guided Reading is meaning-based instructional approach where the teacher works with a small group of students in order to develop reading strategies. The primary focus is on constructing meaning while using problem-solving strategies to decode unknown words. The LLI instruction used in the present study incorporated Guiding Reading

where the reading interventionists supported the development of effective strategies in order for the participants to process texts at increasingly challenging levels of difficulty.

### **Literature Review Related to Key Concepts and Variables**

#### **Struggling Readers**

In order to be a proficient reader, a student must be able to decode accurately and read fluently with understanding (Snowling & Hulme, 2011). Students who do not possess said skills tend to have lower achievement in reading, unidentified reading difficulties, dyslexia, and/or with a reading LD (Scammacca et al., 2013). Vaughn, Roberts, Wexler, et al. (2015) defined struggling readers as being “more than 3 grade levels below the students’ actual grade and/or performance below the 25<sup>th</sup> percentile on a standardized measure of reading normed on probability based samples” (p. 547). Gambrell, Morro, and Pressley (2007) explained how struggling readers are in the bottom 10% of their class and spend less time reading than good readers. According to Ehri (2014), this is due to struggling readers’ inability to decode or comprehend unknown text. Cain and Oakhill (2011) discussed how poor readers get less practice in word reading and comprehension because they engage in less out-of-school reading resulting in delayed development of decoding and comprehension skills. This demonstrates the association of reading skills and the volume of reading experience. Differences in reading habits take time to develop (Cain & Oakhill, 2011). According to Cain and Oakhill, reading practice influences reading and language development throughout the life span. Partanen and Siegel (2014) outlined skills associated with reading development: phonological

awareness, letter knowledge, rapid automatized naming, working memory, and other language skills (i.e., semantics, syntax, and morphology).

**Characteristics of younger struggling readers.** Younger students tend to struggle with basic reading processes involving decoding (Cirino et al., 2013). Bonifacci and Tobia (2016) reported that decoding problems are linked to phonological skills. Decoding is learning to link sounds and letters (Thomson, Doruk, Mascio, Fregni, & Cerruti, 2015). Specifically, decoding or word recognition is the process “of extracting enough information from word units so that a location in the mental lexicon is activated, this resulting in semantic information becoming available to consciousness” (Stanovich, 1982, p. 486). Perfetti and Stafura (2014) proposed that good quality lexical knowledge enables good comprehension.

**Characteristics of older struggling readers.** Reading comprehension difficulties tend to characterize older struggling readers (Catts, Compton, Tomblin, & Sittner-Bridges, 2012). Difficulties in reading comprehension have been linked to poor semantic knowledge, poor morpho-syntactic and pragmatic skills, trouble with making inferences and scarce use of meta-cognitive skills (Bonifacci and Tobia, 2016). Van den Broek, Kendeou, Lousberg, and Visser (2011) explained that in order to comprehend a text, it is essential that a student be able to decode language units and to construct a coherent mental representation of the text. According to Van den Broek et al. (2011), the student accesses this mental representation for different purposes after reading is complete: to recall information from the text, answer questions, and apply the knowledge obtained from the text. McMaster et al. (2012) explained how a coherent text representation is

formed when information in the text is integrated with the student's background knowledge. Poor comprehenders can have deficits in comprehension only, word recognition only, or a combination of comprehension and word reading (Catts et al., 2012; Compton et al., 2014). This is exemplified when students are "so involved in decoding individual words that they forget to try to make sense out of the entire sentence or passage" (Walker, 2003, p. 26). Older students experience a wide and complex range of reading difficulties. Therefore, a reading intervention geared for older struggling readers should include explicit vocabulary instruction and comprehension strategy instruction. Instructional recommendations for reading interventions for students in Grades 4-12 are discussed later in this chapter.

### **Causes of Reading Difficulties**

Behavior-genetic studies of twins have been conducted to help provide an explanation for why students differ in their reading skills (Blachman et al., 2014; Cain & Parrila, 2014; Olson, Keenan, Byrne, & Samuelsson, 2014). The uniqueness of these studies is their ability to estimate average influence from genes and shared environments on reading skills. Plomin, DeFries, McClearn, and McGuffin (2008) explained how twins share genes and environments (e.g., books in the home, support for reading from family, shared teachers, classrooms, friends) that make them similar and yet different in nonshared environments (e.g., different friends, teachers, classrooms). Behavior-genetic studies can assess specific reading skills such as decoding and listening and reading comprehension and how genetic and environmental factors influence these skills (Olson

et al., 2014). These studies provide a deeper understanding of why students differ in their reading skills.

**Environmental Factors.** In their report on why children differ in their reading acquisition skills Olson et al. (2014) discussed environmental factors. These factors included preschool language and print exposure, quality and quantity of reading instruction in school, peer and family influences, socioeconomic level, and learning to read in a second language (Olson et al, 2014). Individuals who struggle with reading often have problems associated with increased risk of poverty, unemployment, criminal conviction, and ill health (Holmes et al., 2012). Hagans and Good (2013) explained how students from low income homes are disproportionately at-risk for developing persistent learning problems that have long-term detrimental outcomes. Additionally, Duff, Tomblin, and Catts (2015) discussed how the maternal education level can effect early vocabulary levels that expand into the school years. Students who have been provided with early educational opportunities tend to be more successful than students who enter school without these opportunities. This is important because according to Olson et al. (2014), by the age of 10 students have an established developmental trajectory for growth gains in reading. Environmental factors contribute to why children differ in their reading acquisition skills as well as provide insight into the long-term outcomes for children who struggle with reading.

**Genetic factors.** Cain and Parrila (2014) discussed how genetic differences among students play a central role in the determination of reading development after the initial period of formal reading instruction. Further, Blachman et al. (2014) explained

how students with high familial risk of reading difficulties showed no evidence of catching up between the ages of 8 and 13. Olson et al. (2014) explained how genetic influences are substantially greater than environmental influences on individual differences in students' reading abilities. This is a phenomena known as the *Matthew Effect* (Stanovich, 1986). Reading is comprised of many skills such as spelling, phonemic awareness, decoding, and comprehension. According to Olson et al. (2014), genetic factors influence the environmental input that is needed to learn these skills.

### ***The Matthew Effect***

The Matthew Effect refers to the progression of scientific research careers in which advantages and disadvantages accumulate so that the rich get richer and the poor get poorer (Duff et al., 2015). The Matthew Effect in reading was first proposed by Stanovich in 1986. The term was used to describe how the gap between good and poor readers increases over time (Blachman et al., 2014; Stanovich, 1986). Duff et al. (2015) explained further that the prediction of the Matthew Effect model could help guide interventions for students at-risk for poor vocabulary development.

### **Essential Elements of Reading Instruction**

The National Reading Panel (NRP) (2000) identified five essential elements of reading instruction. These five elements included: phonemic awareness, phonics, vocabulary, fluency, and comprehension (National Reading Panel, 2000). Cirino et al. (2013) explained how phonological awareness and phonics are tied to the development of word recognition skills whereas vocabulary and comprehension are connected to make up



the comprehension component. Fluency is the speed in which the reader effectively generates meaning (Cirino et al., 2013). The five essential elements will be explored more closely in the following sections.

**Phonemic awareness.** Phonemic awareness is knowing that words are made up of individual sounds or phonemes and having the ability to manipulate these individual sound units (Ehri, 2014). This is to say that “before children can make sense of the alphabetic principle, they must understand that the sounds that are paired with letters are one and the same as the sounds of speech (Adams, Foorman, Lundberg, & Beeler, 1998, p. 19). Beginning readers must know that individual sounds combine to make up a word. Additionally, beginning readers must also recognize that the same sounds are found in many different words (e.g., the /m/ in mat has the same sound as the /m/ in ham) (Coyne, Kame’enui, & Carnine, 2011). According to Partanen and Siegel (2014), the most consist skill that struggling readers have difficulty with is phonological awareness.

**Phonics.** Phonics is the relationship between the letters (graphemes) of written language and the individual sounds (phonemes) of spoken language (National Institute of Child Health and Human Development [NICHD], 2001). Instruction in phonics should teach students how to connect sounds with letters or groups of letters in a word. This is the most common method of teaching students how to decode (Galuschka, Ise, Krick, & Schulte-Körne, 2014; Nag, Snowling, & Asfaha, 2016). Lessons in phonics include various vowel and consonant patterns such as short and long vowels, diphthongs, consonant and vowel clusters, and diagraphs. Phonics instruction “should be integrated with reading instruction in phonemic awareness, fluency, and comprehension strategies in

order to create a complete reading program” (NICHD, 2001, p. 11). This is to say that phonics instruction should not be taught in isolation. The learning of letters, sounds, and words should be integrated throughout students’ reading experience. For the present study, participants were taught phonics through Guided Reading where all language systems (i.e. semantics, syntax, and morphology) were incorporated simultaneously to create a complete reading program.

**Vocabulary.** Understanding words or vocabulary knowledge plays a major role in comprehension (Coyne, Kame’enui, & Carnine, 2011; Hulme & Snowling, 2011). Simply put, if students do not understand the meaning of individual words then they will not understand the overall meaning of a sentence or paragraph (Stahl, 1991).

Coyne, Kame’enui, and Carnine (2011) used the following example:

We were completely surprised to see a pluff emerge from the box! If a reader or listener did not know the meaning of *pluff*, it would be difficult to make sense of the entire sentence. If, however, a reader knows that *pluff* means ‘kitten’, the sentence becomes more comprehensible. (p. 89).

Good vocabulary knowledge refers to understanding words in order to communicate effectively. According to Perfetti and Stafura (2014), good vocabulary promotes text comprehension and text comprehension promotes vocabulary expansion.

**Fluency.** The NICHD (2001) defined fluency as “the ability to read a text accurately and quickly” (p. 34). This is to say that fluent readers group words quickly to help them derive meaning from what they read. Chard, Vaughn, and Tyler (2002)

explained how fluent reading also includes expressive oral language and the rapid, efficient, and accurate application of word recognition or decoding skills used during silent reading. In sum, if students spend too much time and energy trying to figure out what the words are then they will not be able to concentrate on what the words mean (Coyne, Kame'enui, & Carnine, 2011; Perfetti & Stafura, 2014; Walker, 2003). Many struggling readers lack the ability to read words automatically. In order for students to comprehend texts and achieve high levels of reading achievement fluency is essential.

**Comprehension.** Comprehension is the ultimate goal or very essence of reading (Coyne, Kame'enui, & Carnine, 2011; Solis et al., 2012). It can be defined as a reader's interaction with the text (Goldstein, 2011). This interaction consists of understanding the meanings of individual words in a text as well as having a repertoire of strategies to make sense of what was read. However, the argument has been made that reading comprehension is not a skill but rather a set of complex higher level mental processes that include: thinking, reasoning, imagining, and interpreting (Kamhi, 2009). Van den Broek et al. (2011) explained how language comprehension skills can independently predict a student's reading comprehension.

### **The Simple View of Reading**

Reading has been viewed as a complex activity. However, Gough and Turner (1986) outlined a more simple view of reading. In the Simple View of Reading (SVR) model there are two components to reading: word recognition (decoding) and linguistic comprehension (Gough & Turner, 1986; Olson et al., 2014; Reynolds et al., 2011).

According to Bonifacci and Tobia (2016), impairment in the decoding department paired

with adequate language comprehension skills is typically referred to as specific reading disorder or dyslexia.

### **Evidence of the Problem**

The argument has been made that it takes 50 years to bridge the gap between research findings to daily classroom practices (Allington, 2013; Cook & Cook, 2013). Topics addressed in this section show the latest empirical results regarding the problem of lack of effective reading interventions in a multitiered support system like RtI. These findings are from the latest empirical studies on RtI interventions. The results will demonstrate how the information gleaned in the background section relates to the research problem that affects current daily classroom practice.

### **Lack of Reading Theory**

Researchers such as Compton et al. (2014) have questioned the effectiveness of current interventions designed to aid students who struggle with reading. In their argument Compton et al. hypothesized that reading interventions have diluted reading theory in ways that compromise the effectiveness of the interventions. Other researchers argue that there is no theory to reading (Perfetti & Stafura, 2014). This is to say reading has too many components for a single theory. Perfetti and Stafura (2014) explained how there are theories to a manageable part of reading such as word reading and comprehension and that the research of the last 20 years have guided specific problems rather than the testing of a precise theory.

## **Entrepreneurial Enterprises**

While some researchers argue over the existence of reading theory in interventions, other researchers argue that entrepreneurial enterprises hold more clout on daily practice than do research findings (Allington, 2013; Shannon & Edmondson, 2010). In other words, what the research findings indicate have been ignored and that ineffective instructional practices ensue in U. S. classrooms (Allington, 2013). Several researchers have reported that entrepreneurial documents as in ‘buy our stuff’ have increased over time as well as masqueraded research summaries (Allington, 2013; Taylor, Anderson, Au, & Raphael, 2000; Murray, Munger, & Hiebert, 2014).

Response to Intervention is typically comprised of three tiers with Tier I being core reading instruction for all students. Allington (2013) reported that “no research supports the use of core reading programs in fostering reading growth” (p. 523). After their analysis of five core reading programs, Dewitz, Jones, and Leahy (2009) noted the following:

- Core reading programs bear little relationship to research findings on fostering the development of reading and related skills such as comprehension.
- Core programs do not provide sufficient amount of guided practice as otherwise indicated by research.
- Core reading programs do not provide a scaffold or gradual release of responsibility as researchers have developed.
- Core reading programs do not follow research findings on providing explicit instruction.

- Teachers tend to not relate strategies to one another or make their impact on reading clear in core reading programs.

Further, Lipson and Wixson (2012) explained how published programs provide needed materials and supplemental supports, but they do not provide the scaffold that struggling readers need.

### **Implementation Fidelity**

The tiers in an RtI model increase in intensity leading to additional areas of concern when identifying effective reading interventions which was the focus of this study. One concern according to Wanzek and Roberts (2012), is that educators have the least information on students in the more intensive tiers of RtI in regards to how to effectively increase their reading skills. A second concern is that interventions that have demonstrated effectiveness in some settings can be ineffective in other settings (Fixen, Naoom, Blase, Friedman, & Wallace, 2005). This could be due in part to the lack of fidelity while implementing the intervention. Implementation fidelity within reading interventions for Tiers II and III is also evidence of the research problem.

Implementation fidelity or integrity of practice is the adherence to implementing an intervention in the way it was designed to be implemented (LeMahieu, 2011). Harn, Parisi, and Stoolmiller (2013) discussed the assumptions of fidelity of implementation which are student outcomes are higher when interventions or EBPs are implemented with high fidelity and poorer outcomes are a result of implementation with low fidelity.

However, from their analysis of reading programs, Dewitz et al. (2009) concluded that “fidelity to a flawed program is not a virtue” (p. 122). Furthermore, Allington (2013)

explained how research that suggests maintaining fidelity to a reading program in order to provide effective reading lessons simply does not exist.

### **Small Effect Sizes**

A review of the literature presents data which illustrate that there is a lack of sufficient effective research based reading interventions which is indeed a problem in Special Education practice (Buckingham et al., 2014; Reynolds et al., 2011; Swanson, Solis, Ciullo, & McKenna, 2012). According to the review completed by Reynolds et al. (2011) on the What Works Clearinghouse (WWC)'s (2007) report, only a small number of interventions met the rigorous criteria to be coined EBPs. Cook and Cook (2013) discussed four fundamental issues when determining EBPs: research design, quality of research, quantity of research, and magnitude of the effect of supporting studies. These fundamental issues are important because while there are numerous standardized interventions used in schools, only few have rigorous scientific backing to support their effectiveness for struggling readers (Reynolds et al., 2011). Therefore, according to Reynolds et al. (2011), educators should look at the underlying processes used in reviews when determining effective interventions.

### **Interventions**

A well-founded intervention has one fundamental component. According to Snowling and Hulme (2011), this component is being centered on sound theory of the origins of the learning difficulties (e.g., decoding, comprehension). This also includes having an understanding of how a given skill is learned by typically developing children in order to plan a suitable educational intervention. The following will display what the latest empirical findings indicate about reading interventions.

**Scripted and standardized protocol.** In a standard protocol intervention EBPs are used in a scripted and standardized manner for all students with reading difficulties (Gilbert et al., 2013; Vaughn, Wexler, Roberts, et al., 2011). A standard protocol typically includes a well-specified treatment furnished in a step-by-step sequence. According to Vaughn, Wexler, Roberts, et al. (2011), educators consider standard protocols easier for school personnel to implement because of the following:

- Standard protocols include teachers' guide and student materials for instructional support.
- Scripted and standardized protocols furnish clear expectations for ease of implementation and fidelity determination.
- Standard protocols provide schools a way to document what has been taught in order to help guide decision making processes and placement in Special Education.
- Scripted and standardized protocols leverage school resources more efficiently.

That being said, Allington (2013) pointed out that as long as there is a reliance on paraprofessionals delivering reading lessons in intervention programs through Title I or Special Education programs, then schools in the United States will not deliver high-quality lessons. Furthermore, Goldstein (2011) reported on the lack of well-trained teachers using EBPs for 2/3 of LD students.



**Individualized approach.** The individualized approach is grounded in Special Education from a clinical teaching perspective (Vaughn, Wexler, Roberts et al., 2011). Lessons are designed to meet students' instructional needs. The individual needs of each student are documented through instructional monitoring and weekly progress monitoring. Vaughn, Wexler, Roberts, et al. (2011) pointed out that information on the effectiveness of individualized approaches is scarce.

### **Components of Effective Reading Interventions**

**Grades K-3.** There are some researchers who agree that reading difficulties for many children can be prevented with early intervention (Galuschka et al., 2014; Goldstein, 2011; Reynolds et al., 2011; Toste et al., 2014; Zumeta, Compton, & Fuchs, 2012). According to Goldstein (2011), there are several things that young children need to be aware of in order to become successful readers. These things include: phonemic awareness, phonics, recognizing a large number of sight words, possessing language skills, and having the ability to think critically about the text. Goldstein also elaborated on two broad classes of early literacy skills: code based (alphabetic knowledge and phonological awareness) and meaning focused (oral language skills [vocabulary and grammar] and word knowledge). Torgesen (2005) and Wanzek et al. (2013) suggested early intervention span from the second semester of kindergarten to the end of second grade in order for struggling readers to catch up with their typically developing peers and remain with the average range of achievement in both reading accuracy and fluency.

Reynolds et al. (2011) outlined what should be included in early reading programs and interventions. The elements of successful reading instruction were derived from a

synthesis of a large scale review which included direct and explicit instruction in phonemic awareness, phonics, fluency, vocabulary, and comprehension. Reynolds et al. reported that phonemic awareness should begin early and focus on two key aspects: blending and segmentation. While the synthesis of the review indicated a need to teach phonics, there was not a consensus on the most effective approach (e.g. synthetic model vs. systematically).

***The 4<sup>th</sup> Grade Slump.*** The number of students served in Special Education nearly doubles (increases by 99%) nationally for students in the upper elementary grades (United States Department of Education, 2010). This is due to what Catts et al. (2012) and Beach and O'Connor (2013) referred to as late-emerging poor readers. These struggling readers were first discussed by Chall (1983) who coined the term *fourth grade slump*. Students who show adequate or better progress in beginning reading experience a drop in reading scores by 4<sup>th</sup> grade indicating that these students fail to thrive and can no longer meet grade level expectations (Chall & Jacobs, 1983; Wanzek et al., 2013). Chall offered suggestions for the slump in reading. One suggestion was that these students did not possess the linguistic and/or conceptual skills needed to understand more demanding texts. A second suggestion was that some students may fail to develop fluency in word reading resulting in a disruption in comprehension as texts become more challenging.

**Grades 4-12.** As students move up the grades remediating reading difficulties is increasingly difficult (Vaughn, Wexler, Leroux, et al., 2012). Many students in grades 4-12 require reading intervention to improve their comprehension skills (Scammacca et al., 2013; Vaughn, Wexler, Roberts, et al., 2011; Wanzek et al., 2013). According to

Vaughn, Wexler, Roberts, et al. (2011), older students demonstrate a broad range of reading difficulties in addition to comprehension deficits. These difficulties include word recognition, understanding word meanings, and understanding and connecting with text. Comprehension deficits can be due to the lack of background knowledge needed to understand a given text (Vaughn, Wexler, Leroux, et al., 2012; Vaughn, Wexler, Roberts, et al., 2011). Older students will lack the skills needed to join the workforce or pursue postsecondary education without effective reading interventions (Scammacca et al., 2013).

There are specific deficits in reading such as with word recognition, fluency, and comprehension as well as reading related processes that include vocabulary and listening comprehension (Cirino et al., 2013). Kim, Wagner, and Foster (2011) reported that oral reading rather than silent reading was a stronger predictor of comprehension and that listening comprehension was more important than decoding fluency for struggling readers. Older students who demonstrate reading achievement just below grade level expectations often need direct support for vocabulary and comprehension, however, these students are generally able to learn from a text (Wanzek et al., 2013). For students who are more than 2 grade levels behind, these students are unable to read grade level texts indicating more significant word reading and fluency problems along with vocabulary and comprehension deficits (Cirino et al., 2013). Duff et al. (2015) explained how the argument can be made that the student's home environment explains the differential growth in vocabulary. According to Duff et al., vocabulary growth during school years is mostly the result of incidental learning from written contexts.

Instructional recommendations were outlined by Wanzek et al. (2013) for reading interventions for students in grades 4-12. These recommendations included: providing explicit vocabulary instruction, using direct and explicit comprehension strategy instruction, and providing struggling readers with intensive and individualized instruction delivered by trained specialists. Cirino et al. (2013) discussed effective routes for improving reading comprehension which included targeting a variety of texts, utilizing cognitive strategies especially when strategy instruction is explicit and overt. Additionally, Roberts, Vaughn, Fletcher, Stuebing, and Barth (2013) explained how older readers who are fluent but struggle with comprehension may benefit from strategy instruction including monitoring, summarization, and question generation. Furthermore, Vaughn, Wexler, and Leroux et al. (2012) encouraged using texts that build background knowledge and understanding for content learning (e.g., science and social studies). Solis et al. (2012) noted the importance of providing students with self-monitoring tools such as mnemonics, mapping, and questioning. Solis et al. also noted that explicit instruction should include modeling, feedback, and opportunities to practice. According to Solis et al., strategy instruction is essential in order for students to understand the purpose of reading as well as equipping them with the skills needed to understand texts. The sources of reading difficulties for older students are diverse, therefore, according to Cirino et al. (2013), interventions should integrate instruction in accuracy, fluency, and comprehension.

### **Intensifying Interventions**

There are several methods in which to increase the intensity of reading interventions. Wanzek et al. (2013) reported that increasing time in intervention and decreasing the group size are two research based methods for increasing the intensity. Roberts et al. (2013) explained how some students may need a year of intervention whereas other students may require more intensive, longer term intervention. Roberts et al. defined intensive long term intervention as multi-year, exceeding 9 months. Older students with significant reading problems may benefit from a multi-year intervention.

Six methods to intensify interventions for inadequate responders in Tier II supports were outlined by Gersten et al. (2009). One method was providing concentrated instruction that focuses on a select number of target skills. A second method was teaching to mastery. Adjusting the pace of instruction was the third method. The fourth method was scheduling multiple and extended daily sessions. Providing ample opportunities to respond was the fifth method. The last method offered by Gersten et al. for increasing intervention intensity was to deliver the instruction one-on-one. Gersten et al. also noted how variables such as curricula, instructional dosage, grouping, and pacing can be adjusted to decrease as well as increase the intensity of supports. Additionally, Simmons et al. (2011) reported that timing is an important dimension related to reading interventions. According to Simmons et al., beginning interventions earlier rather than later has shown to be more effective.

There are various factors to consider on the efficacy of interventions. Gillies (2012) outlined the following factors:

- Young and older students with mild reading disabilities show more improvement than those with more severe impairments.
- Interventions with increased intensity such as higher amounts or longer duration of treatment seem to be more effective in improving literacy skills.
- Interventions conducted by the author tend to show higher effect sizes than interventions implemented by other conductors. Suggesting that having a solid knowledge base about reading disability in children might enhance treatment efficacy.
- Interventions that are used with children of a wide age span is not recommended.

Additionally, Coyne et al. (2013) concluded that systematically adjusting intervention support in response to student performance may be feasible and efficacious. In contrast to intensifying interventions, Lipson, Chomsky-Higgins, and Kanfer (2011) explained how students may not need *more* intervention if the intervention consists of tailored and focused instruction based on careful and comprehensive assessment.

### **Multicomponent Reading Interventions**

Multicomponent interventions address various reading and related skills. Wanzek and Roberts (2012) noted that implications for future research is to examine multicomponent interventions at the upper elementary grades. However, according to Scammacca et al. (2013), there is a need to improve the knowledge base concerning component skills in order for multicomponent interventions to be more effective.

A study was conducted by Wagner and Espin (2015) in order to determine the relative effects of word-fluency, comprehension oriented, and multicomponent interventions on reading fluency for fifth and sixth grade struggling readers. The authors discussed how multicomponent interventions combine two or more approaches: (a) word, (b) fluency, and (c) comprehension oriented approaches. Wagner and Espin further explained the rationale for multicomponent approaches. According to the authors, “fluency is a complex skill that requires proficiency in and coordination of multiple skills, many of which are difficult for struggling readers” (p. 548). Multicomponent interventions often examine the effects of combined reading variables, including, but not primarily fluency. However, according to Hudson, Pullen, Lane, and Torgesen (2009), readers are likely to read fluently when they have balanced and connected reading subskills.

A meta-analysis was conducted by Stevens, Walker, and Vaughn (2016) of multicomponent interventions involving fluency. The meta-analysis consisted of 19 studies that examined reading fluency and comprehension outcomes of reading fluency interventions for students with LD in Kindergarten through fifth grade. According to the National Reading Panel (NRP) (2000), reading fluency is one of the critical factors necessary for reading comprehension. However, Stevens et al. (2016) reported that Swanson (2008) noted how fluency instruction is often overlooked for students with LD. Stevens et al. further explained that researchers such as Fuchs, Fuchs, and Compton (2010) discussed how students with LD spend less time with text which negatively affects vocabulary acquisition and comprehension development contributing to the

achievement gap. In their review of multicomponent fluency interventions with LD students between January 2001 and September 2014, Stevens et al. (2016) found that guided oral repeated reading is the most effective method for improving reading fluency and comprehension.

### **Alternative Approaches to Improve Reading Achievement**

The research on various approaches to increase reading achievement have provided insights into structures needed to promote inclusive educational practices. One study conducted by Mitchell, Mansfield, and Rautenbach (2008) examined the use of colored lenses and their effect on reading achievement. The findings revealed that colored lenses could not prove any positive effect other than being due to placebo effects. Researchers such as Wilsher and Taylor (1994) studied the effect medication had on reading and spelling skills for children and adolescents. Their findings revealed that medication had minor effects on reading and spelling resulting in the researchers noting that risks of medication outweighed the benefits. Further, Hattie (2009) reported that computer-assisted technology was shown to have little effect on reading achievement. Additionally, Loo, Bamiou, Campbell, and Luxon (2010) reported that auditory trainings do not significantly improve children and adolescents' reading and spelling skills.

Researchers have studied other methods such as physically active instruction and music and their effects on improving reading achievement. Mullender-Wijnsma et al. (2016) studied the effects of physically active math and language lessons on academic achievement. The intervention studied was *Fit & Vaardig op School (F & V)*. The researchers used a cluster-randomized controlled trial with 499 children with a mean



average of 8.1 years from second and third grade classes from 12 elementary schools. The treatment group received F & V lessons for 2 years, 22 weeks per year, 3 times a week. Academic achievement was measured by two mathematics tests (speed and general math skills) and two language tests (reading and spelling) before the intervention began and after the intervention years. Results indicated that the treatment group had significantly greater gains in mathematics speed tests, general mathematics, and spelling. No differences were found on the reading tests.

Two separate studies were conducted by Habib et al. (2016) on music as part of instructional practice for children with dyslexia. One study consisted of musical exercises for dyslexic children over 18 hours for 3 consecutive days whereas the second study consisted of 18 hours of musical training over a 6 week period. Results from both studies showed significant improvements in both linguistic and nonlinguistic variables. The second study revealed additional improvements in phonological awareness and reading abilities.

The relationship between parental involvement and student performance has been studied by numerous researchers. Researchers such as McNeal (2015) discussed how the relationship between parent involvement and student performance is contingent on the ecological context in which they occur; suggesting educators modify their effects to improve parental involvement based on the ecological characteristics of the school. Crosby, Rasinski, Padak, and Yildirim (2015) studied parental involvement and early literacy. A school-based parent involvement program was studied for three years. During the three years, levels of parental participation grew over time. Results indicated

higher levels of academic achievement associated with the program. Castro et al. (2015) conducted a meta-analysis on parental involvement and academic achievement. The meta-analysis consisted of 37 studies in Kindergarten, primary and secondary schools between 2000 and 2013. The results yielded positive results in parental models that focused on general supervision of children's learning activities. The strongest associations were found when families set high academic expectations, effective communication with school personnel, and ways to develop reading habits.

### **Critical Analysis of Literature**

There have been numerous studies conducted relating to reading for younger students with a limited amount for older students since the passing of the NCLB and IDEA. These studies include components of reading for each age level. For example, according to Galuschka et al. (2014), the teaching of phonics is the most studied treatment approach for younger students whereas vocabulary and comprehension are most studied for older students (Wanzek & Roberts, 2012).

Researchers such as Blachman et al. (2014) conducted a randomized trial on the long-term effects of early reading interventions. The researchers hypothesized that the students who received the eight months of reading treatment would achieve higher reading and spelling outcomes than those students who received the regular school based intervention. The results yielded a small to moderate effect size over the comparison group more than a decade after the intervention. Hagans and Good (2013) also conducted a randomized control trial, but the authors studied children from low income homes who were at risk for developing persistent reading problems. The authors

concluded that with the implementation of systematic phonological awareness instruction there was a decrease in low income differences related to early literacy skills, specifically phonological awareness. In their study of early identification, Partanen and Siegel (2014) reported that phonological awareness was the most consistent skill that identified students as nonresponders.

A meta-analysis conducted by Wanzek et al. (2013) studied extensive interventions for students beyond the third grade. The results of their meta-analysis indicated that reading outcomes can be positively impacted with extensive interventions. Vaughn, Roberts, and Wexler (2015) conducted a randomized control trial investigating reading interventions that extended more than one school year with secondary students. Their results showed effectiveness for providing longer interventions particularly when the intervention is aligned with content from social studies and science standards. Thus indicating that secondary students who struggle with reading can improve when targeted with appropriate intervention (Scammacca et al., 2013).

Education researchers have approached the problem of ineffective reading interventions by conducting randomized control trials, longitudinal studies, and meta-analyses. The strengths and weaknesses in their studies come from their choice of research design. There are certain types of research designs that address whether or not the independent variable causes a change in the dependent variable. According to Cook and Cook (2013), these research designs are: group experimental, group quasi-experimental, and single-subject. In sum, these designs rule out alternative explanations for what may have caused the change in the dependent variable. Snowling and Hulme

(2011) reported that the best evidence in determining whether or not an intervention works comes from random controlled trials.

### **Summary and Conclusions**

A comprehensive review of the literature was conducted. With the in-depth review of the literature, how the current study fits with latest research and implications for daily practice with what is known about effective reading interventions was demonstrated. Specifically, this section provided a review of the research related to key variables.

Research has shown that intervention can substantially improve reading and related skills of struggling readers. While schools have a plethora of available interventions for poor readers, there has been little evidence to support their efficacy. The concern is that these interventions are being delivered in the absence of evidence of effectiveness. Further, the interventions that have been supported by reliable research to positively impact student performance are not being implemented in classrooms resulting in a research to practice gap in education. Chapter 3 will provide an over view of the methodology that was used to determine the efficacy of LLI on reading achievement.

### Chapter 3: Research Method

The purpose of the present study was to determine the effects of LLI on reading achievement of students in Grades 2-5 who did or did not receive LLI instruction. The following elements of the study will be discussed in this section: research design and rationale, methodology, data analysis plan, threats to validity, and ethical procedures.

#### **Research Design and Rationale**

In this study, the independent variable LLI, on a dependent variable (reading achievement) was examined over time. A quasi-experimental pretest and posttest design was used to determine the impact of LLI on the reading achievement of students in Grades 2-5 who were in Tier III of the RtI process. The best research design to establish cause and effect is a true experimental study. For the present study, random assignment was not possible, therefore, the best research design to answer the research question and test the hypotheses was the quasi-experimental pretest and posttest design (Creswell, 2012). According to Creswell (2012), researchers utilize this type of research design in order to compare scores of different treatments between groups. This was my rationale for choosing a quasi-experimental pretest and posttest design.

A quantitative approach utilizing an experimental research is best used to determine if a specific treatment influences an outcome (Creswell, 2012). The pretest and posttest design is consistent with research designs needed to advance knowledge in Special Education. By allowing the researcher to determine each group's progress in reading and draw conclusions about the effect of LLI as well as insights on the effects of

LLI in more realistic circumstances offers greater validity than a laboratory study (Snowling & Hulme, 2011).

Fountas and Pinnell's LLI is a short-term supplemental literacy intervention. LLI is designed to be used with small groups of students with one teacher 5 days a week for 30 minutes per session (Heinemann, 2011). The goal of the program is to provide intensive support to help struggling readers achieve grade level competency (Heinemann, 2011). An investigation was needed to determine if there was a significant impact on reading achievement for students in grades 2-5 who were in Tier III of the RtI process from LLI.

## **Methodology**

### **Population**

A population in a research study refers to "a group of individuals who have the same characteristic" (Creswell, 2012, p. 142). The target population for this study was students in Grades 2-5 who were in Tier III of the RtI process and attended a rural elementary school in the southeastern region of the United States. The population was Tier III students in Grades 2-5.

### **Sampling and Sampling Procedures**

A nonprobabilistic convenience sampling strategy was employed for the current study. Creswell (2012) discussed how in nonprobability sampling, the researcher selects participants because they represent a characteristic the researcher aims to study and these individuals are available and convenient. Convenience sampling, according to Creswell,

involves individuals who are willing and available for the researcher to study which is the justification for utilizing the nonprobabilistic convenience sampling strategy.

Specific procedures for how the sample was drawn follow. There are five elementary schools in the selected school district. Three of the five schools are relatively small (approximately 200 students as opposed to 600) in regards to student enrollment. Therefore, the sample was drawn from the two larger elementary schools in order to obtain a truer representation of the entire population (students in grades 2-5 who were in Tier III of the RtI process attending the selected school district). The sampling frame inclusion criteria were students in Grades 2-5 who were in Tier III of the RtI process attending the two larger elementary schools within the selected school district and scored below the grade level expectation on the Fall 2015 BAS and MAP assessments. Students who scored on or above the grade level expectation on the Fall 2015 BAS and MAP assessments and attended either one of the selected elementary schools were excluded from the current study. The sampling size was determined by the number of students in Grades 2-5 who attended either of the larger elementary schools within the selected school district and scored below the grade level expectation on the Fall 2015 BAS and MAP assessments.

### **Intervention**

The Fountas and Pinnell LLI is a supplementary reading intervention for students who struggle with reading and writing (Heinemann, 2016b). The LLI is designed for the lowest achievers at their grade level who do not receive another intervention. Students in Grades 2-5 who met the eligibility criteria on the Fall 2015 BAS and MAP assessments

and recommended by the student support teams were administered LLI instruction for 45 minutes a day, 5 days a week, for 8 weeks by the reading interventionists from both of the schools. The reading interventionists were teachers with either of the following qualifications: K-8 elementary education certification, special education certification, or reading specialist and had been trained in LLI in order to conduct intensive learning sessions. Students received systematically designed LLI lessons in a small group pull-out setting. Materials that were used as treatment consisted of engaging leveled books in both reading and writing.

The LLI was developed by Fountas and Pinnell in 2008. Both Fountas and Pinnell are college professors with experience in classroom teaching and developing comprehensive literacy programs (Heinemann, 2016a). LLI has been used with a variety of school aged populations; namely kindergarten through eighth grade students (Heinemann, 2016a). The intervention has also been used with Special Education populations (Heinemann, 2011).

The type of quantitative data that was used to answer the research question for this study was measures of individual performances. These performances were measured using the BAS and MAP. Unaltered measurements or raw scores from both the BAS and MAP (interval level of measurement) from categorical data (nominal level of measurement) of intact groups of students in grades 2-5 who received LLI instruction and students in Grades 2-5 who did not receive LLI instruction were collected. The data were collected from the two larger elementary schools within the selected school district once permission to collect data had been obtained. Students in Grades 2-5 attending both



elementary schools in the selected district were assessed the same way in order to ensure standardized practices in administration procedures.

All students in Grades 2-5 attending the two elementary schools from the selected school district were administered the BAS and the MAP assessments in the Fall of 2015. Both assessments were district required, therefore, all students in Grades K-8 were administered each assessment in the Fall and Winter of 2015 and again in Spring 2016. I retrieved data once Walden University's Institutional Review Board (IRB) approval was secured. Students in Grades 2-5 who met the eligibility criteria formed the experimental group. The eligibility criteria were reading two-three levels below the grade level entry target as measured by the BAS and scoring below the grade level target on the Fall 2015 MAP assessment. Students were also assigned to the experimental or control groups through decisions made by the student support teams. These teams consisted of both general and Special Education teachers, parents, administrators, and reading interventionists. In an RtI model with fluid movement of all three tiers, the student support teams reviewed student data from the previous year. Greulich et al. (2014) summarized fluid movement as students moving fluidly up or down tiers of an RtI model based on data. The students who were selected by the student support teams and scored below grade level on the BAS and MAP assessments formed the experimental group. The students who scored below grade level on the BAS and MAP assessments but were not selected by the student support teams formed the control group. Grade level targets were obtained from the Fountas and Pinnell's Progress Monitoring by Instructional Text Reading Level Chart. The LLI instruction lasted 8 weeks, 45 minutes daily for 5 days a

week in a pull-out small group setting. Scores from the BAS were kept in the schools' database and scores from the MAP were kept in the Northwest Evaluation Association's (NWEA) database. Analysis was conducted after data collection.

The procedure for gaining access to the data sets was conducted through a written request. A formal letter was sent to both district and school level administration seeking permission to access the data. In order to gain access to the data sets permission needed to be secured from several individuals. Permissions were needed from: Walden University's IRB and both the district and school level administration.

## **Instrumentation and Operationalization of Constructs**

### **Instrumentation**

The BAS was developed by Fountas and Pinnell in 2008 (Heinemann, 2016a). The BAS was appropriate for the current study because the BAS matches students' instructional and independent reading abilities through one-on-one assessment. Published reliability values of the BAS included test-retest reliability of fiction and nonfiction books are as follows: .93 for book series A-N, .94 for book series L-Z, and .97 for all books (A-Z) (Heinemann, 2012.). The convergent validity values will be discussed later in this section. The published reliability and validity values are relevant to the current study for two reasons. The first reason being the values demonstrate how the current study can yield consistent and accurate results. The second reason the published reliability and validity values are relevant to the current study is because they demonstrate how the reliability and validity of the BAS compare with other assessments that measure similar variables. In order to obtain the reliability and validity values,

according to Heinemann (2012), an outside team of three independent researchers analyzed data from formative evaluations of the BAS from 497 students spanning grades K-8. Field testing of *System 1* (grades K-2 for levels A-N) included 252 students and 245 students for *System 2* (grades 3-8 for levels L-Z) from a total of 22 different schools in the following geographic regions of the United States: Boston Metropolitan area, Providence Rhode Island, Houston Metropolitan area, Los Angeles area, Columbus Ohio area, and Orlando Florida area.

Reliability is the consistency of scores of an assessment (Creswell, 2012). In order to measure the test-retest reliability of the BAS the “students’ reading scores on the fiction series were correlated with their scores on the nonfiction series” (Heinemann, 2012, p.11). Test validity is the degree to which the assessment measures what it purports to measure (Creswell, 2012). To measure validity of the BAS, the assessment outcomes are related with other tests that assess reading. This is known as convergent validity. According to Heinemann (2012.), “convergent validity examines the relationship between an assessment’s test scores and scores from other instruments that measure similar variables” (p.11). The results from the field test of reliability and validity indicated convergent validity to have a strong association in System 1 with a correlation of .94 for fiction texts and a correlation of .93 for nonfiction texts and *Reading Recovery*. This is an important finding since Reading Recovery was the only program of 153 reviewed by WWC that had strong evidence of improving reading achievement (Allington, 2013; Reynolds et al., 2011). For System 2, the BAS yielded a moderately indicative performance on the *Slosson Oral Reading Test-Revised (SORT-*

*R3*) with a correlation of .69 for fiction texts and .62 for nonfiction texts and a moderately indicative performance on the *Degrees of Reading Power (DRP)* with a correlation of .44 for fiction texts and .42 for nonfiction texts (Heinemann, 2012).

The MAP was developed by the NWEA by educators nearly 40 years ago (NWEA, 2016c). The MAP was appropriate for the current study because according to the NWEA (2016c), the MAP informs instruction and maximizes academic growth through the creation of a personalized assessment experience by precisely measuring student progress and growth for each individual. The MAP provides greater sensitivity to detect growth by adjusting the difficulty of items up or down based on each student's individual response (NWEA, 2016a). This means that when a student correctly answers a question, the student is then presented with a more difficult item and when a student answers a question incorrectly, the student is presented with a simpler item. To ensure adequate content validity, according to the NWEA (2016a), the NWEA's research team tests often and conducts a variety of analyses including pool depth analysis, test validation, and comparability studies. The NWEA assessments and items have been used with nearly 10,000,000 students (NWEA, 2016c). The MAP utilizes a Rasch Unit (RIT) scale. According to the NWEA (2016b), the RIT scale "is a stable equal-interval scale" (para. 1). This allows for the comparison of student performance relative to national achievement and growth norms as well as state standards.

Over a substantial amount of time a comprehensive item bank has been established to help with reliability (NWEA, 2016c). With the extensive item bank of questions, tests have been developed over a considerable amount of time (NWEA,

2016c). This has allowed for the opportunity to establish the reliability of the tests through statistical analysis. According to the NWEA (2016d), the result has been a collection of significant amount of reliability over time.

The NWEA test and retest studies have yielded statistically valid correlations between multiple tests events for the same student (NWEA, 2016d). According to the NWEA (2016d), most test and retest studies rely on retesting students within several days, whereas the NWEA retests students after a lapse of several months. In doing so, the reliability indices have consistently been statistically significant (NWEA, 2016d). With the volume and breadth of the item bank, internal validity (reliability between items) has also been significant. The NWEA explained how the rigor that has been applied to the reliability studies, MAP users can be confident of the reliability of their tests.

### **Operationalization of Constructs**

The operationalization of constructs is the specification of how the variables in a study are defined and measured (Creswell, 2012.) Operationally defining each variable increases the quality of results and improves the robustness of the research design. For the current study, reading achievement was operationally defined as gains made on the BAS and MAP. Reading scores were calculated using the BAS through one-on-one assessments conducted by reading interventionists. The MAP scores were calculated through the computer software within 24 hours of the test administration. The reading scores represented the reading levels of the participants in relation to their typically developing age-appropriate peers.

### **Data Analysis Plan**

The *Statistical Package for the Social Sciences (SPSS)* was the software used for the analysis. Once the data had been entered into the computer grid, I checked to ensure the data were clean and void from any errors or missing data. I had the SPSS program sort cases in ascending order for each variable in order to clean the data. According to Creswell (2012), this procedure allowed me to spot out-of-range or misnumbered cases. Before analysis, a visual inspection was needed for the assurance that the data were clean and free of errors. I also examined my data base for missing data. Creswell noted that missing data will yield fewer participants. Therefore, checking for missing data was crucial for including as many individuals as possible for the analysis.

The research question and hypotheses were as follows:

### **Research Question**

RQ: What are the effects of LLI on the reading scores of second-fifth grade students who receive LLI supplemental intervention support in a pull-out setting?

### **Hypotheses**

H<sub>0</sub>: There is no significant difference between the reading scores of second-fifth grade students who receive LLI instruction and the reading scores of second-fifth grade students who do not receive LLI instruction as measured by the BAS and MAP assessments.

H<sub>1</sub>: There is a significant difference between the reading scores of second-fifth grade students who receive LLI instruction and the reading scores of

second-fifth grade students who do not receive LLI instruction as measured by the BAS and MAP assessments.

The ANCOVA was the parametric statistical test that was used to test the hypotheses. An inferential analysis needed to be conducted in order to compare the experimental and control group. According to Creswell (2012), an inferential analysis allows the researcher to examine scores from a sample and use the results to make inferences about the population. To determine if the difference between the two groups was meaningful, the effect size was calculated. The effect size identifies the strength or significance of the conclusions about group differences. The ANCOVA was used to control for the pretest scores when comparing the two groups. In other words, the ANCOVA helped decrease the chance of a Type II error by treating the pretest scores as a covariate. According to Creswell (2012), there are several approaches for determining if the sample scores collected are a good estimate of the population scores. All of the approaches help eliminate any misinterpretations and errors that are associated with yes-no hypothesis testing. The three estimates of the population which include: hypothesis testing, the confidence interval, and effect size were reported. The significance or alpha level was set at .05. A  $p$  value was calculated in order to determine the significance of the results. In research, the null hypothesis is rejected if the  $p$  value is less than the alpha (Triola, 2012). If the  $p$  value is greater than the alpha, researchers fail to reject the null hypothesis indicating that there is a nonsignificant difference between the experimental and control group.

## **Threats to Validity**

### **External Validity**

Experimental studies are designed so that inferences made are true and accurate. According to Creswell (2012), external validity refers to the degree in which the sample results can be generalized beyond the sample used in a study. Threats to external validity are problems that compromise the researcher's ability to draw true and accurate inferences from the sample data to the broader population (Creswell, 2012). Threats to external validity of the current study included people, places, and time. This is to say that the results of the study were due to the unique type of people who were in the study, the setting in which the study took place, and the particular time the study was conducted. Lodico et al. (2010) referred to this as specificity of variables which deals with the specific conditions of a study (i.e., time, place, participants, and instrumentation). The generalizability of the study becomes more limited with greater specificity of the variables. A way to address these threats to external validity is to replicate the study in a variety of places, with different people and at different times. In doing so, external validity will be stronger with each replication.

### **Internal Validity**

Threats to internal validity refer to the inability to draw appropriate inferences related to the causality of the treatment on the outcome or dependent variable (Creswell, 2012). Internal validity is the degree to which correct inferences can be made about whether the differences in the independent variable contributes to the variation in the dependent variable. Threats to internal validity of the current study included: history,



testing, instrumentation, experimental mortality, and selection- maturation interaction. History, according to Creswell (2012), is the passing of time from the beginning to the end of the experiment and events occurring outside administration of the pretest and posttest that can influence the outcome of a study. With the exception of the treatment, I addressed this threat to internal validity by having similar activities for both the control and experimental group. Testing is the internal threat to validity that deals with participants becoming familiar with the outcome measures and remember responses for later testing (Creswell, 2012). I remedied this situation by measuring the outcome less frequently and using different items on the posttest than those used on the pretest. Instrumentation consists of changes in the instrument between the administration of a pretest and a posttest (Creswell, 2012). I corrected for this potential problem by using standardized procedures. Experimental mortality or attrition is when individuals drop out of the study for a variety of reasons (Creswell, 2012). I addressed this threat to internal validity by choosing a large sample and comparing those who drop out with those who remain on the outcome measure. Selection-maturation interaction refers to what Creswell called ‘people factors’ that include the selection of individuals who are perceptive and more susceptible to and familiar with treatment. I addressed this internal threat to validity by pretesting participants.

### **Statistical Conclusion Validity**

Statistical conclusion validity was another potential threat to the present study. According to Rumrill, Cook, and Wiley (2011), statistical conclusion validity refers to the degree to which conclusions about the covariation of variables are correct or

reasonable. The authors explained how the conclusions may be erroneous if the statistical procedures are not conducted rigorously. Threats to statistical conclusion validity in the present study included: low statistical power, violated statistical assumptions of statistical tests, fishing and error rate problems, unreliability of dependent measures, low reliability of treatment implementation, and inaccurate effect size estimate.

### **Ethical Procedures**

Ensuring the adherence to ethical procedures is the greatest concern of all aspects of the research process. The three ethical principles to consider are: justice, beneficence, and respect for persons which help ensure that the benefits outweigh the risks. Obtaining and documenting informed consent through full disclosure in written form by signature is acknowledging autonomy. Institutional permissions, including IRB approvals that were needed to gain access to the data are included in this section. This includes relevant IRB approval numbers. The IRB approval numbers for the present study were 10-28-16-0400208.

There was no risk to the participants due to the nature of the study. Data were anonymous. This is to say that personal identifiable information was stripped from the data. Privacy helped with confidentiality and protection of harm by minimizing the risks of beneficence. Data will be kept in a locked cabinet that only I will have access. After five years the data will be destroyed.

There were other ethical issues that needed to be addressed. One issue was conducting a study within one's own work environment. The site for the present study

was the district in which I teach. I was not in a supervisory role and used anonymized data which helped eliminate any possible conflicts of interest which was another ethical issue. Withholding treatment was another ethical concern. This concern was addressed by offering LLI to the control group in the Spring of 2016, if needed.

### **Summary**

The purpose of the present study was to determine the effects of LLI on reading achievement of students in Grades 2-5 who did or did not receive LLI instruction. The following elements of the study were discussed in this section: research design and rationale, methodology, data analysis plan, threats to validity, and ethical procedures. All of which provided an overview of how the current study was conducted.

Specifically, quantitative methods were used to answer the research question and test the hypotheses. The quasi-experimental pretest and posttest was the design of choice. This design was chosen to examine the efficacy of LLI on reading achievement of students in Grades 2-5 who were in Tier III of the RtI process. Methods included using the ANCOVA to determine if there was a significant difference between the experimental and control group. Once all permissions had been secured and data had been collected, analysis was conducted using the SPSS computer program. A discussion of the research findings will be provided in Chapter 4.

## Chapter 4: Results

The purpose of this study was to determine the effects of LLI on reading achievement of students in grades 2-5 who did or did not receive LLI instruction. The research question was: What are the effects of LLI on the reading scores of second through fifth grade students who receive LLI supplemental intervention support in a pull-out setting? The hypotheses were as follows:

H<sub>0</sub>: There is no significant difference between the reading scores of second-fifth grade students who receive LLI instruction and the reading scores of second-fifth grade students who do not receive LLI instruction as measured by the BAS and MAP assessments.

H<sub>1</sub>: There is a significant difference between the reading scores of second-fifth grade students who receive LLI instruction and the reading scores of second-fifth grade students who do not receive LLI instruction as measured by the BAS and MAP assessments.

In this chapter, data collection, treatment and intervention fidelity, and results will be discussed. These components make up the organization of Chapter 4.

### **Data Collection**

The study included 136 struggling readers in the RtI process from two rural elementary schools in the southeastern region of the United States. The time frame for data collection was 8 weeks. There were not any discrepancies in data collection from the plan presented in Chapter 3.

## Description of the Sample

Data were collected from 136 students in Grades 2-5 from two elementary schools. Students in the RtI process who received LLI instruction made up the experimental group and the students in the RtI process who did not receive LLI instruction made up the control group. The experimental group consisted of 72 students from two rural elementary schools from the southeastern region of the United States, including 51% male students and 49% female students. The control group consisted of 64 students from two rural elementary schools from the southeastern region of the United States, including 47% male students and 53% female students. Table 1 displays demographic data using descriptive statistics from both the experimental and control group.

Table 1

### *Demographic Data of Experimental and Control Group*

	Experimental Group (Received LLI instruction)		Control Group (Did not receive LLI instruction)	
	<i>n</i>	%	<i>n</i>	%
Gender				
Male	37	51	30	47
Female	35	49	34	53

The population for the study was Tier III students in Grades 2-5. The sampling size was determined by the number of students in Grades 2-5 who attended either of the larger elementary schools within the selected school district and scored below the grade

level expectation on the Fall 2015 BAS and MAP assessments. A nonprobabilistic convenience sampling strategy was employed. According to Creswell (2012), researchers use nonprobability sampling because the participants represent a characteristic targeted for study and these individuals are available and convenient. The sample is a proportion of the entire population and all its characteristics. The sample was drawn from a group of students who possessed the same characteristics as the population. Therefore, the sample is ideally proportional to the larger population.

### **Intervention Fidelity**

The LLI was administered as planned. Students in Grades 2-5 who met the eligibility criteria on the Fall 2015 BAS and MAP and recommended by the student support teams were administered LLI instruction for 45 minutes a day, 5 days a week, for 8 weeks by the reading interventionists from both schools. The students received systematically designed LLI lessons in a small group pull-out setting. There were no reported adverse events related to the intervention.

## **Results**

### **Descriptive Statistics**

Descriptive statistics are numbers that are used to summarize and describe a given data set (Creswell, 2012). Descriptive statistics help describe and understand the specific features of the data by providing short summaries about the sample and measures of data (Creswell, 2012). According to Creswell (2012), descriptive statistics are broken down into measures of central tendency and measures of variability. The mean, median, and

mode are the most common types of descriptive statistics (Triola, 2012). Descriptive statistics that appropriately characterize the data are as follows. The mean score of the BAS posttest for the experimental group was 13.3. The mean score of the BAS posttest for the control group was 13.1. The mean score for the MAP posttest was 183 for the experimental group and 180 for the control group. Please see Tables 2 and 3. Scores were higher for the experimental group on both posttests.

Table 2

*BAS Posttest Descriptive Statistics for Experimental and Control Group*

Group	Mean	Std. Deviation	N
Experimental Group	13.3889	3.20455	72
Control Group	13.1875	4.02325	64
Total	13.2941	3.60065	136

Table 3

*MAP Posttest Descriptive Statistics for Experimental and Control Group*

Group	Mean	Std. Deviation	N
Experimental Group	183.0556	14.11910	72
Control Group	180.8281	14.09441	64
Total	182.0074	14.09938	136

### **Statistical Assumptions**

There were several statistical assumptions that needed to be evaluated before computing the ANCOVA. The first statistical assumption was that there were no significant outliers. The second statistical assumption was that residuals should be

approximately normally distributed for each category of the independent variable.

Homogeneity of variances was the third statistical assumption. The fourth statistical assumption was the covariate should be linearly related to the dependent variable at each level of the independent variable. Homoscedasticity was the fifth statistical assumption. The sixth and last statistical assumption was homogeneity of regression slopes. I was able to check for each assumption using the SPSS.

### **Data Analysis**

Descriptive and inferential statistics were used in the data analysis. According to Creswell (2012), descriptive statistics indicate general tendencies in the data whereas inferential statistics analyze data from a sample to draw conclusions about an unknown population. An ANCOVA was employed to determine if there was a difference between the experimental and control group. Conclusions could be made about the effect of the independent variable based on the findings and the design of the study.

The ANCOVA analyzed the effects of the independent variable, LLI instruction, on the dependent variable, reading achievement. This analysis allowed me to analyze group differences while controlling for the pretest. In this analysis the pretest was treated as a covariate in order to test for a significant difference between the experimental and control group. The alpha level was set at  $\alpha = .05$  for all analyses. Confidence interval, according to Triola (2012), is associated with a confidence level that provides “the success rate of the procedures used to construct the confidence interval” (p.346). The mean and standard deviation were used in the construction of a confidence interval. The



SPSS reported a 95% confidence interval for the differences between the means of the two groups.

### **Discussion of Findings by Research Question and Hypotheses**

**Research question:** What are the effects of LLI on the reading scores of second-fifth grade students who receive LLI supplemental intervention support in a pull-out setting?

**Hypotheses:** The null hypothesis was: There is no significant difference between the reading scores of second-fifth grade students who receive LLI instruction and the reading scores of second-fifth grade students who do not receive LLI instruction as measured by the BAS and MAP assessments. The alternative hypothesis was: There is a significant difference between the reading scores of second-fifth grade students who receive LLI instruction and the reading scores of second-fifth grade students who do not receive LLI instruction as measured by the BAS and MAP assessments.

An ANCOVA was conducted to determine a statistically significant difference between reading scores of students in Grades 2-5 who were in the RtI process and received LLI instruction and reading scores of students in Grades 2-5 who were in the RtI process and did not receive LLI instruction on posttests reading achievement scores while controlling for the pretest. Measures of effect size were also calculated using ANCOVA. Measures of effect sizes are measures of the degree of association between effect and the dependent variable. Creswell (2012) discussed how effect sizes are a means for identifying practical strength of the conclusions about group differences. The effect sizes

for both posttest assessments are displayed in Tables 4 and 5 under partial eta squared for group.

There was a significant effect on the BAS posttest scores between the experimental and control group,  $F(1, 73) = 42, p = .001$  with a moderate effect size ( $\eta^2 = .241$ ). There was a significant effect on the MAP posttest between the experimental and control group,  $F(1, 765) = 12, p = .001$  with a small effect size ( $\eta^2 = .086$ ). Please see Tables 4 and 5. The  $p$ -values were less than the specified significance level ( $\alpha = .05$ ). Therefore, the null hypothesis was rejected and it was concluded that there was a significant difference between the reading scores of second-fifth grade students who received LLI instruction and the reading scores of second-fifth grade students who did not receive LLI instruction as measured by the BAS and MAP assessments.

Table 4

*ANCOVA Results for BAS Posttest: Tests of Between-Subjects Effects*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1520.217 <sup>a</sup>	2	760.108	439.505	.000	.869
Intercept	260.803	1	260.803	150.800	.000	.531
FallFP	1518.842	1	1518.842	878.216	.000	.868
Group	73.002	1	73.002	42.211	.001	.241
Error	230.019	133	1.729			
Total	25786.000	136				
Corrected Total	1750.235	135				

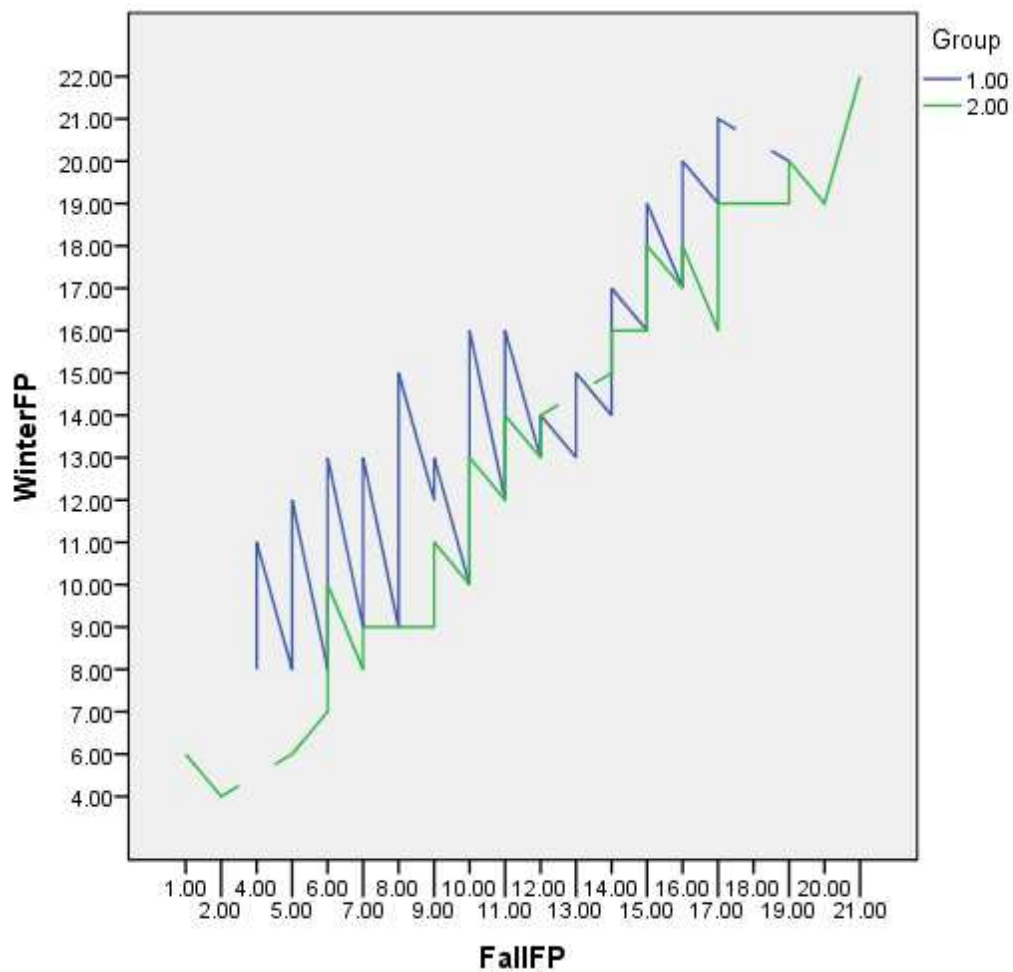
a. R Squared = .869 (Adjusted R Squared = .867)

Table 5

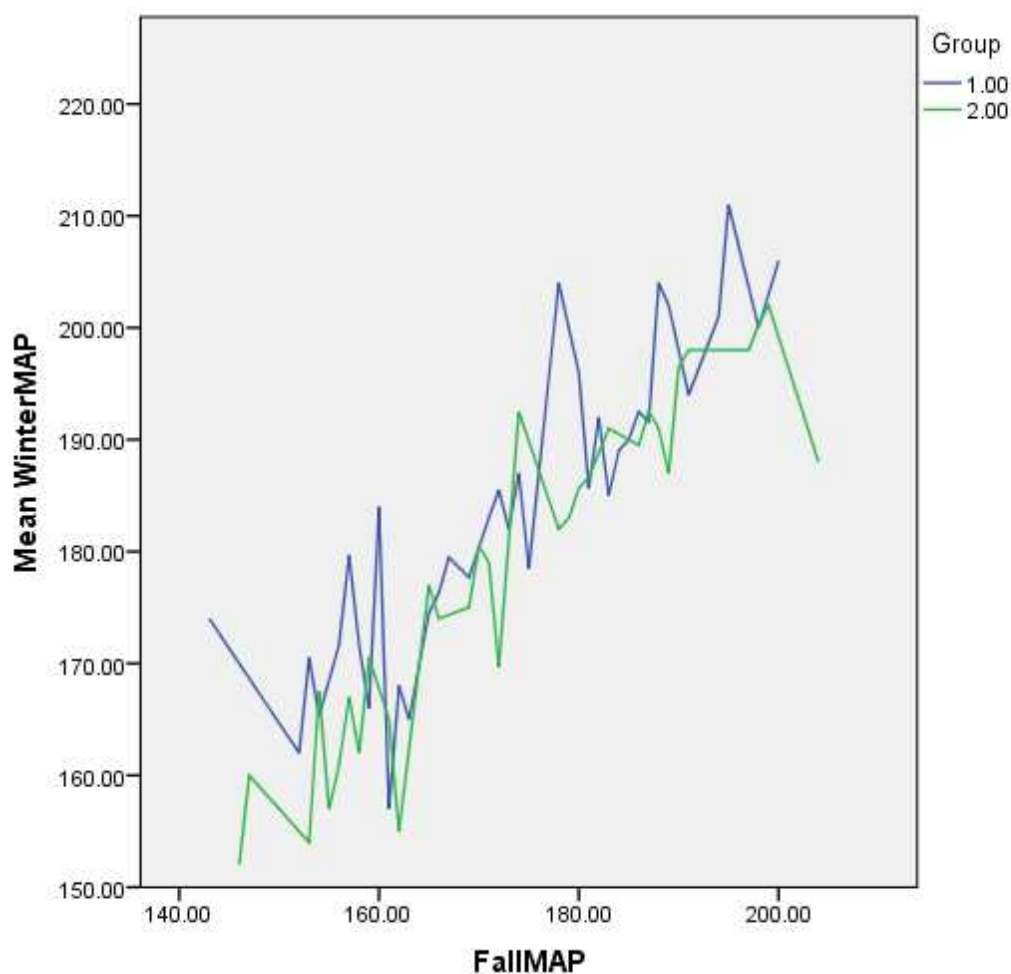
*ANCOVA Results for MAP Posttest: Tests of Between-Subjects Effects*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected						
Model	18685.913 <sup>a</sup>	2	9342.956	152.448	.000	.696
Intercept	1424.319	1	1424.319	23.240	.000	.149
FallMAP	18517.807	1	18517.807	302.152	.000	.694
Group	765.359	1	765.359	12.448	.001	.086
Error	8151.3080	133	61.286			
Total	4532065.000	136				
Corrected						
Total	26836.993	135				

a. R Squared = .696 (Adjusted R Squared = .692)



*Figure 1.* Chart of significant reading scores between the experimental and control group based on the BAS posttest. Group 1 is experimental (blue line) and Group 2 is control (green line).



*Figure 2.* Chart of significant reading achievement scores between the experimental and control group based on the MAP posttest. Group 1 is experimental (blue line) and Group 2 is control (green line).

### Summary

The purpose of this quasi-experimental study was to determine the effects of LLI instruction on reading achievement of students in grades 2-5 who did or did not receive LLI instruction. Data were analyzed using an ANCOVA in order to determine the effects of LLI while controlling for the pretest. It was concluded that there was a statistically

significant difference between the experimental and control group, therefore, the null hypothesis was rejected. The interpretation of the findings, limitations of the study, recommendations, and implications will be discussed in Chapter 5.

## Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this study was to determine the effects of LLI on the reading scores of students in Grades 2-5 who were in the RtI process. The nature of the study was quantitative. The study was conducted to determine if there was a significant difference between the reading scores of students in Grades 2-5 who were in the RtI process and received LLI instruction and the reading scores of students in grades 2-5 who were in the RtI process and did not receive LLI instruction.

The reading scores of students in Grades 2-5 who were in the RtI process and received LLI instruction were compared to the reading scores of students in Grades 2-5 who were in the RtI process and did not receive LLI instruction. The SPSS was used to determine the mean score and standard deviation for both posttests. An ANCOVA was conducted to determine the *p*-values and levels of significance. The *p*-values for both posttests were below the specified alpha level ( $\alpha = .05$ ). The *p*-value for the BAS was .001 and the *p*-value for the MAP was .001. Therefore, I was able to reject the null hypothesis and conclude that there was a statically significant difference between the reading scores of students in Grades 2-5 who were in the RtI process and received LLI instruction and the reading scores of students in Grades 2-5 who were in the RtI process and did not receive LLI instruction as measured by the BAS and MAP assessments.

### **Interpretation of the Findings**

The research question that guided the study was: What are the effects of LLI on the reading scores of second-fifth grade students who receive LLI supplemental intervention support in a pull-out setting? The results showed a significant difference

between the reading scores of second-fifth grade students who received LLI instruction and the reading scores of second-fifth grades students who did not receive LLI instruction as measured by the BAS and MAP posttests.

The results from this study support the findings from other similar studies. Ransford-Kaldon et al. (2010) concluded that the LLI system positively impacts students' literacy skills. Furthermore, Murray et al. (2014) asserted that LLI assists students in the earliest stages of reading when they do not yet know letters and sounds as well as in the reading to learn stage with vocabulary acquisition and comprehension. A study conducted by Ransford-Kaldon, Flynt, and Ross (2011) examined the efficacy of LLI as a Tier II intervention. Findings from their study were analogous to the results from the present study in that LLI is effective with high-risk populations.

### **Limitations of the Study**

There are several limitations associated with this study. The first limitation is characteristics of the sample and sample size. The sample was relatively small in that the sample was derived from students in Grades 2-5 in one rural school district in the southeastern region of the United States. The generalizability of the study to the larger population of students in Grades 2-5 who struggle with reading may be impacted due to the nonrandom sample. A second limitation to the study includes reading gains being attributed to outside influences such as in the home or community rather than from LLI. Another limitation is that this study did not examine the effects of LLI on reading achievement for each particular grade level. The lack of random assignment is also a limitation of the study. Random assignment was not possible due to the participants



being assigned to the RtI process based on individual scores on the BAS and MAP reading assessments.

### **Recommendations**

There are several recommendations for further research. One recommendation is to study the effects of LLI on reading achievement for specific grades. Continued implementation of LLI would be beneficial and is a second recommendation. Future research is also warranted in longitudinal tracking to determine the long-term impact of LLI on students' literacy development.

### **Implications**

A gap in the literature was addressed by the results of this study. The results of this study showed a significant effect on the reading scores of students in Grades 2-5 who were in the RtI process and received LLI instruction compared to the reading scores of students in Grades 2-5 who were in the RtI process and did not receive LLI instruction. By examining the effects of LLI, students who have a SLD can be differentiated from general education students whose difficulties could be remediated with scientifically based interventions within the general education setting. Implications from this study can help prevent the over identification of students with a SLD as well as identify students who need more intensive intervention.

The potential impact for positive social change from this study can occur on a variety of levels. A result of improved reading ability at the individual level is students being equipped with the skills to join the workforce and pursue postsecondary education.

At the organizational level, stakeholders can engage in scholarly dialogue about effective reading practices and interventions for struggling readers which could help shape, improve, or change educational policy. Potential impact for positive social change at the societal level includes economic growth, reduced poverty and crime rates, and better health as well as promoting democracy and increasing civil engagement.

The empirical findings of this study revealed a reading intervention that is effective for high-risk populations. Effective reading interventions are a driving force for positive social change because such interventions address reading skills for students who do not read proficiently at grade level. For daily classroom practice that means tailoring the intervention to meet the students' individual learning needs for a more focused instruction.

### **Conclusion**

The very essence of this study was the investigation of effective reading interventions for students in the RtI process. Specifically, the intervention studied was LLI and its effects on reading achievement of students in Grades 2-5 who were in Tier III of the RtI process. Reading is fundamental for educational success and independence later in life. However, failure to read has shown to have serious consequences such as behavior problems, dropping out of school, reduced employment, and being trapped in poverty (Bradley & Greene, 2013; Connor et al., 2014; Holmes et al., 2012). The results of this study showed a significant difference between the reading scores of second-fifth grade students who received LLI instruction and the reading scores of second-fifth grade students who did not receive LLI instruction. Given the positive potential of the LLI

program, positive social change can ensue by informing educational policy that leads to promising academic, social-emotional and economic outcomes for all students who struggle with reading.

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