The Effect of Response to Intervention on Student

Achievement Using Second Grade Benchmark

Assessments

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The Effect of Response to Intervention on Student Achievement Using Second

Grade Benchmark Assessments

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To the College of Graduate Studies:

We are submitting a field study written by Deanna Carr entitled "The Effect of Response to Intervention on Student Achievement Using Second Grade Benchmark Assessments." We have examined the final copy of this field study for form and content. We recommend that it be accepted in partial fulfillment of the requirements for the degree of Educational Specialist.

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DEDICATION

I would like to dedicate this study to everyone who has supported me throughout this process. A special thank you to my biggest supporter, my wife, Ryleigh who has encouraged me day in and day out and has spent countless hours taking care of our newborn son, Jaxon, while I work. I appreciate your love and support, and want to express my gratitude towards the many ways in which you have made this work possible. Thank you for being my biggest fan.

ACKNOWLEDGEMENTS

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ABSTRACT

DEANNA MICHELLE CARR. The Effect of Response to Intervention on Student Achievement Using Second Grade Benchmark Assessments (under the direction of DR. JOHN MCCONNELL III).

The purpose of this study was to determine if struggling students who are in second grade were still able to minimize gaps in their assessment scores and increase their achievement as a result of receiving supplemental instruction through Tier II and Tier III of Response to Intervention (RTI). The 135 second grade students were administered the Path Driver assessment for reading to assess their literacy skills. Students' beginning of the year and middle of the year oral reading fluency and Maze reading comprehension benchmark scores were analyzed to determine if, when gaps in achievement are identified in at risk students who then receive additional and more individualized support through RTI, are able to improve their benchmark scores. Analyses of covariance revealed no statistically significant differences in students' scores of students who received supplemental instruction in Tier II of Tier III and of those students who only received Tier I instruction; however, the growth scores of students who received only Tier I instruction were greater than the students who received additional interventions in Tier II or Tier III.

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CHAPTER I

Introduction

According to the National Center for Learning Disabilities (2000), there are over

2.4 million U.S. public school students identified with having a learning disability under

the Individuals with Disabilities Education Improvement Act (IDEA) of 2004. This is the

fastest growing category of special education, increasing by more than 300 % since 1976

(Cortiella & Horowitz, 2014). The primary area of difficulty for almost 80% of students

who are labeled as having a learning disability is in reading (Lyon et al., 2001). As

defined by IDEA (2004), a learning disability is when a child does not achieve

adequately for the child's age or fails to meet grade level standards in one or more

categories that include: oral expression, listening comprehension, written expression,

basic reading skills, reading fluency skills, reading comprehension, mathematics

calculation, and mathematics problem solving skills when provided with learning

experiences and instruction. As a result, the reauthorization of IDEA (2004) reflects this

concern by including Response to Intervention (RTI) as an identification tool for

educators to more effectively identify students with learning disabilities and to provide

more individualized, high quality, supplemental instruction to struggling students.

Background of RTI

The RTI model is a multi-tiered approach to give struggling students extra time

and interventions to help them progress adequately. RTI was incorporated into the 2004

version of IDEA as an alternative to the IQ discrepancy method for identification of

students with learning disabilities, allowing RTI to be a part of the disability

identification procedures (Hughes & Dexter, 2011). RTI is an instructional framework,

which schools use to provide an early intervention for students experiencing academic difficulties. The conceptual framework of RTI, as adapted from Mellard (2009) in Figure 1, is employed nationwide to address students' needs.
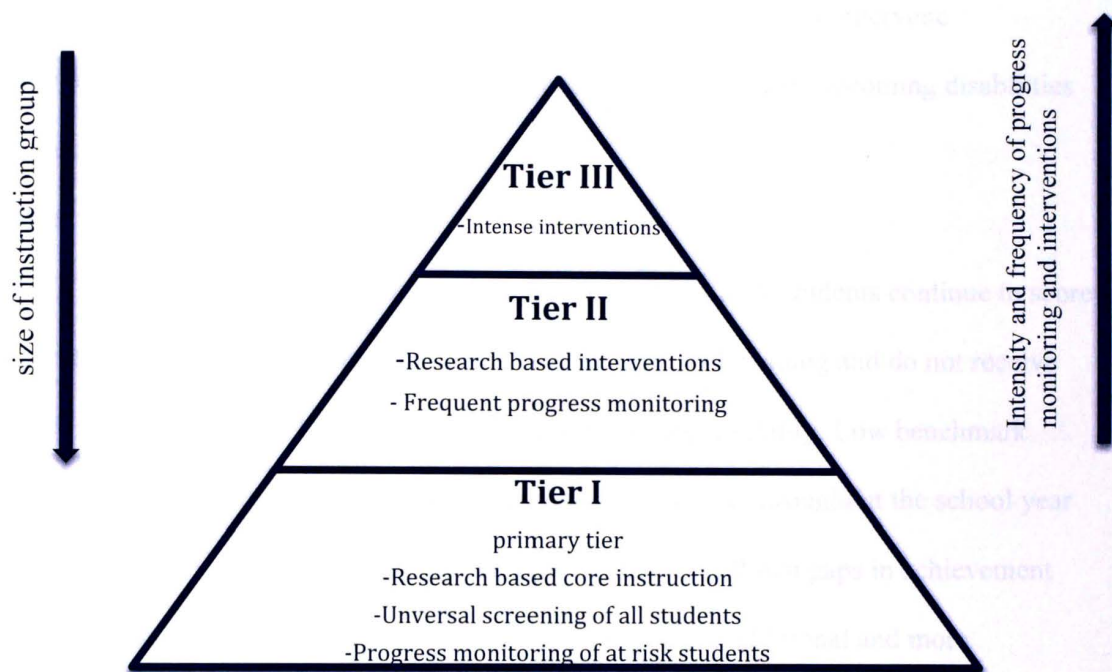
Figure 1. The levels of RTI.

This multi-tiered approach uses three tiers to provide students instruction. Tier I in the RTI model is the instruction all students receive in the classroom as a whole group. This instruction is assumed to be high quality core instruction (Monetti, Breneiser, & McAuley, 2013). Tier II in the RTI model serves as additional support for students who have been identified as needing such intervention. This is provided to students through additional instruction in a small group setting. The final tier, Tier III is the most intensive intervention that is provided to students more often or at a more intense level. Data from

universal screeners, benchmark assessments, progress monitoring, and teacher input are used to determine the instructional tiers in which students are placed.

The RTI framework shifts from the traditional "wait to fail" approach to a more proactive approach to try and prevent small gaps in student achievement from becoming large ones (Averill, Baker, & Rinaldi, 2014). The ultimate goal is to intervene immediately to prevent developmental delays and challenges from becoming disabilities (Greenwood et al., 2011).

Statement of the Problem

Despite receiving high quality core instruction in Tier I, students continue to score low on benchmark assessments. Students who struggle with reading and do not receive early interventions will be identified as having a learning disability. Low benchmark scores require additional interventions. Students are assessed throughout the school year to determine if they are experiencing academic difficulties. When gaps in achievement are identified in students, they are recommended to receive additional and more individualized support through RTI, adding to core instruction to assist in closing these gaps. Based on needs, these students are then given this supplemental instruction with RTI in either Tier II or Tier III small group or individual sessions.

Identifying students as early as possible is key to closing the gaps they may have academically. At risk students who were identified at the beginning of kindergarten as having academic difficulties and who received supplementary interventions through RTI were meeting grade level expectations in reading by the end of first grade (Vellutino, Scanlon, Zhang, & Schatschneider, 2008). RTI is an approach dedicated and designed to serving all students in grades K-12. Students may not be identified as needing additional

support as early as kindergarten. This puts them at risk for not achieving expected language and literacy outcomes as they progress in school (Bradfield, Kaminski, Linas, Carta, & Nylander, 2011). This present challenge may hinder the rate of improvement students show on benchmark assessments and progress monitoring as they reach higher-grade levels.

Early identification and intervention results in successfully increasing student achievement. RTI was created to lessen the amount of unnecessary student referrals for special education. Students are provided with additional instruction to allow them time to meet grade level expectations without being inappropriately or misdiagnosed with having a disability. This study looked at second grade students' benchmark scores to analyze student achievement to determine if these students are no longer making gains in Tier II and Tier III instruction. As a result of that statement, these students should be tested for having a learning disability if little to no progress has been made.

Purpose of the Study

The purpose of this study is to determine the effectiveness of RTI on improving student achievement on second grade benchmark assessments in early literacy skills. This study determined if students who are in second grade are still able to minimize gaps in their assessment scores and increase their achievement as a result of receiving supplemental instruction through RTI.

The current study sought to address this problem by using second grade students' benchmark scores from the Path Driver universal screener they are administered throughout the school year. The students' oral reading fluency (ORF) and comprehension scores from the beginning and middle of the 2015-2016 academic school year on the Path

Driver assessment were compared with students who are receiving additional support through RTI and students who are only receiving the core instruction in the classroom. The study sought to determine if RTI is an effective intervention in second grade resulting in increasing student achievement.

The dependent variables in this study were student achievement operationalized by students' benchmark scores from the beginning and middle of the year assessments for those receiving Tier II and Tier III instruction and the students who are not receiving supplemental interventions. Benchmark scores were compared from the beginning and middle of the year assessments for students not receiving RTI (Tier I) and then for students who receive additional RTI (Tier II and Tier III). The independent variable in this study is the use of RTI. Students either received additional interventions or they only received the initial instruction in the general education classroom. The changes in benchmark assessment scores were also compared between those students who did and did not receive additional RTI. Students were assessed on oral reading fluency and reading comprehension. The students were placed into a percentile ranking from 0-99th percentile. The dependent variable of the students' test scores assessed the effectiveness of the independent variable of RTI.

Vellutino, Scanlon, Zhang, and Schatschneider (2007) investigated similar variables with a population of kindergarten students. These students were identified as being "at risk" for early reading difficulties. They received supplementary RTI instruction in small groups until the end of kindergarten. The results concluded the students who received supplementary intervention improved their literacy skills. This left most students no longer being labeled as "at risk". This study determined early

intervention is key. Students who are identified with having a learning difficulty in reading in kindergarten and are provided with supplemental RTI interventions will improve their progress monitoring and benchmark scores. Vellutino et al. (2007) also concluded that the students who did not improve their scores on early literacy assessments after receiving Tier II or Tier III interventions through first grade would continue to remain classified as at risk and possibly be identified as having a learning disability in reading in the future.

Significance of the Study

This current study expanded on the existing knowledge of the importance of early identification and intervention of at risk students. It determined if supplementary instruction through RTI continued to increase student achievement in second grade or if it was too late to close the gaps and get these students performing at grade level. A 2015 study by Beach and O'Connor came to the conclusion that continuing to make improvements and performing below grade level in third grade is an indicator of a learning disability. The current study may fill the gap between these previously stated studies and determine if students who receive RTI instruction continue to achieve.

All teachers and parents of students receiving RTI instruction will find this study useful in improving their knowledge of the importance of supplementary instruction for struggling students. It determined if supplemental interventions that focused on students' learning difficulties continued to increase student achievement in second grade, leading to less students being identified as having a learning disability.

The Current Study

The current study looked at second grade students and determined if it was too late to close the gaps in achievement to get these students performing at grade level. It was then concluded that if the students receiving Tier II and Tier III interventions were not progressing and making improvements, then they may have a learning disability in reading.

Research Questions

1. Do grade level oral reading fluency (ORF) benchmark scores increase for students who receive RTI as additional instruction time?

2. Do grade level reading comprehension (Maze) benchmark scores increase for students who receive RTI as additional instruction time?

Hypotheses

1. Second grade students who receive supplemental instruction through RTI in Tier II and Tier III will increase benchmark scores on oral reading fluency.

2. Second grade students who receive supplemental instruction through RTI in Tier II and Tier III will increase benchmark scores on reading comprehension.

The theoretical framework of this study is quantitative in nature and has a causal comparative design. The current study intended to measure if the differences in oral reading fluency and reading comprehension benchmark scores were valid based on the positive, negative, or null relationship between the independent (students' receiving Tier II and Tier III instruction and students that only receive Tier I) and dependent variables (oral reading fluency scores and comprehension scores).

Assumptions

In preparation of this study, an assumption was made that all students who received additional interventions through RTI in Tier II or Tier III would significantly increase their oral reading fluency scores. In addition to this assumption, it was assumed by the researcher that the rate of improvement between students in Tier I and students in Tier II or Tier III would be similar. This assumption was made because, even though the students in Tier I were not labeled at risk and performed at grade level, they received less literacy instruction minutes per day than the students who were labeled as struggling. The researcher assumed this additional instruction the students in Tier II or Tier III received would catch them up to their peers, which may have also resulted in a higher rate of improvement in oral reading fluency scores than from those students in Tier I. The assumption was also made that the results would show normality.

RTI blocks of instruction are only as effective as those administering them. For each tier of RTI to be effective, there must be high quality, research based instruction and interventions being implemented. This study made the generalization that all tiers that are being administered are high quality.

Limitations

The limitations to the generalizability of this study assumed that all students who received Tier I instruction received high quality core instruction. It was also generalized that students who received Tier II or Tier III instruction received this as additional interventions and instruction, not core instruction. Threats to the internal validity were copying or receiving assistance. These threats were minimized in the testing environment by creating an environment that was not conducive for either threat. Another limitation

was that students may have guessed on words or read only the words they knew, skipping those they did not know, which would result in a higher words per minute score that was then calculated in their oral reading fluency score. The Maze reading comprehension assessment provides the students with three choices of words to fill in the blanks on the reading passages with which also could have been guessed correctly. This would have negatively affected the students' scores between the beginning of the year (BOY) and the middle of the year (MOY) on both the oral reading fluency and Maze reading comprehension assessments.

CHAPTER II

Review of the Literature

Foundations for Literacy Development

Reading is a complex process involving many components. It is critical that students are provided with a plethora of opportunities to become a proficient, successful reader. According to the National Reading Panel (NRP, 2000), there are five major components in a child's development of reading. These five stages of literacy are phonemic awareness, phonics, vocabulary, oral reading fluency, and reading comprehension as shown in Figure 2. Each stage is related and necessary for the student to become a successful reader.
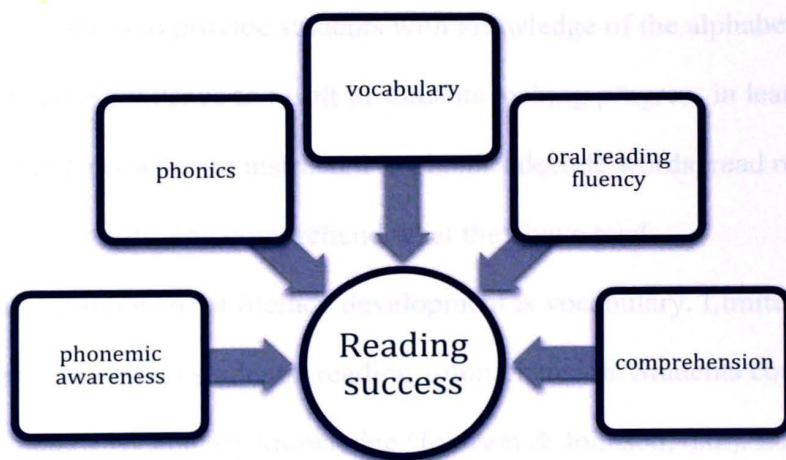
Figure 2. The Five Stages of Literacy

The first stage of literacy development is phonemic awareness. The letter knowledge and phonemic awareness children have when they come to school have been concluded to be the best predictors of their reading success (NRP, 2000). Phonemes combine to form words. They are the smallest unit in the spoken language. Phonemic awareness is the ability to manipulate phonemes into spoken words (Chard, Pikulski, & Templeton 2000). Having phonemic awareness allows for students to identify and isolate

sounds they hear in words, categorize words with the same sounds, blend sounds into words, and break words into segments by the sounds they hear. Phonemic awareness is the understanding that letter sounds, when spoken together, make words (Reading 101: Fluency, n.d.).

Once beginning readers understand the sounds in spoken words, they are able to begin to learn phonics. The letter-sound correspondence used to read and spell words is phonics. Phonics instruction is designed for beginning readers and students who have a difficulty in learning to read. Phonics is used by children to decode new words and read decodable text using the letter-sound relations they have been taught. It is the relationship between sounds of words that are spoken and letters in words that are written. The goal in all phonics programs is to provide students with knowledge of the alphabetic code and letter to sound correspondence to result in students making progress in learning to read (NRP, 2000). Students who are instructed in phonics decode words, read regular and irregularly spelled words, and comprehend what they have read.

The next component of literacy development is vocabulary. Limited vocabularies and word knowledge affect students' reading comprehension. Students come to school with a wide range of vocabulary knowledge (Johnson & Johnson, n.d.). Direct teaching of vocabulary through explicit instruction can help students become better readers. This will decrease students' frustrations when reading unknown words. As students' vocabularies increase, they will better comprehend what they read.

Once beginning readers have a foundation of phonics and phonemic awareness, they read to become fluent. According to an article from the nationally research based website for teaching reading, titled Reading 101: Flueny, fluency is "the ability to read

text accurately, quickly, and with expression." Fluency is a crucial part in the literacy development process. Making adequate progress in learning to read is dependent on fluency (NRP, 2000). It is a set of skills that the reader uses to decode text while comprehending. This develops in continued reading practice. There is a strong correlation with fluency and comprehension. Students who score low on fluency assessments will also have difficulty comprehending what they read and, as a result, score low on comprehension assessments.

The last stage of literacy development is reading comprehension. According to the National Reading Panel (2000), reading comprehension is viewed as the essence of reading. This is because the development of comprehension skills is crucial for students to read for information and to learn. It is an essential part in students' success in school. Reading comprehension is not just reading words but understanding what was read. It is a culmination of the previous stages in literacy development. Readers must master phonemic awareness, phonics, vocabulary, and oral reading fluency before becoming proficient in comprehension (Hughes & Dexter, 2011).

It is imperative students master these early literacy skills by the time they reach third grade. At this time, students are no longer learning to read but reading to learn. If students continue to have difficulties in reading at this stage, then they will continue to fall further behind academically. Evidence supports that students who do not have a successful beginning in learning to read will not become proficient readers (Jones, Yssel, & Grant, 2012).

Instructional Strategies for Teaching Reading

Explicit Direct Instruction (EDI) is a theoretical framework for creating and delivering effective and meaningful lessons (Hollingsworth & Ybarra, 2008). In the EDI model there are several research based instructional strategies that are proven to be effective ways to deliver lessons and increase student achievement in reading. This instructional design uses the following strategies to effectively deliver lessons that target students' literacy development.

(1) *Activating Prior Knowledge.* All new learning is based on prior knowledge. Activating prior knowledge tells students how the new information they are learning relates to real life experiences (Hollingsworth & Ybarra, 2008). Asking students questions prior to a lesson can activate their prior knowledge. According to Christen & Murphy, 1991) when students lack the necessary prior knowledge needed to read, interventions need to be implemented. Students must have the foundational literacy skills as their prior knowledge to build appropriate backgrounds to activate when reading. This can be done by teachers asking students questions about what they already know or have experienced regarding the topic. Teachers may also brainstorm ideas with the students and create a KWL chart recording what they already know, what they want to know, and after the lesson what they have learned.

(2) *Modeling.* Modeling is a way for teachers to show students how to approach, think through, and solve a problem. The EDI framework follows the modeling practice in the following steps: I do, we do, and you do (Hollingsworth & Ybarra, 2008). First, in the "I do" step, the teacher models the strategies being taught. The

teacher models how to think through the process by thinking aloud and how to use the strategies taught to solve problems. Then the teacher leads the students through a guided practice which is the "we do" stage. In this step, the teacher and the class work together to use the strategies while being provided with immediate feedback if needed. Once the students display knowledge of the concept being taught, they practice it independently to show mastery. The teacher will also determine which students are struggling and pull them into a small group for more individualized instruction.

(3) *Checks for Understanding.* Checking for understanding is an important step in the instructional process. When teachers stop throughout the lesson to check for understanding, they are using a technique to ensure all students are engaged and learning. It also is a strategy for teachers to use to quickly determine which students are struggling. Newman & Flaherty (2012), compiled several "quick check tools and protocols" to promote students' engagement and understanding. These instructional tools can be used to promote effective teaching and learning. The quick check tools are described as follows: *Go-around*, teachers ask a rapid succession of questions around the room to ensure students remain on task. *Whiteboards,* students write ideas and answers on the boards and hold them up for the teacher to scan and check who is understanding and who is not. *Thumb-Ometer*, teachers check students' thinking and understanding by having them put their thumbs up, down, or to the side, which shows they still have questions and are unsure. *Red light, green light,* students place a color on their desk that tells the teacher their comfort level. If the student places red, the teacher knows they need

support, yellow displays they have some questions, and green means they are comfortable and can complete the task independently. *Admit and Exit tickets,* students use these slips to enter an activity or as a ticket to leave. These slips display students' thinking, understanding, and readiness for the next step. Checking for understanding allows for teachers to always know whom they need to give additional support to. This instructional strategy gives a clear representation of the students' current level of understanding.

(4) *Using flexible grouping.* This strategy groups students with varying abilities. This allows for students to peer tutor and learn from one another (Echevarria & Graves, 2007). This strategy can help struggling readers by providing time to practice with their peers as they receive support.

(5) *Guided Reading.* In guided reading students read texts that are at their reading level. Guided reading comprises of the following common elements from the International Literacy Association as stated by Burkins (2016): teachers work with small groups, students are matched with texts at their reading ability, groups are made according to students' levels, the teacher listens to individuals read aloud, and the teacher engages students in conversations about what they just read. The goal of guided reading is to teach lessons based on students' needs and teach the students reading strategies they can practice with the group and later do independently.

The instructional reading strategies listed above provide teachers with the foundational skills and techniques needed to create and deliver effective lessons. In order for teachers to remain proficient and fully understand the current research based

instructional strategies, they require professional development (Sanger, Friedli, Brunken, Snow, & Ritzman, 2012). Implementing RTI as an additional intervention for at risk students will provide the teachers and students with additional research based interventions to improve student achievement.

RTI Framework

Students who are not responding to Tier I instruction require additional support through interventions. Teachers use research based instructional strategies in Tier I instruction to ensure students are receiving high quality instruction. The primary focus of RTI is to assess and address the needs of struggling students. Response to Intervention (RTI) uses a preventative based approach to identify students who will benefit from supplementary instruction. This evidence-based instruction is tailored to meet individual student's needs. These students have not been identified as having a specific learning disability but need additional support to succeed in school. The RTI framework involves multiple tiers of instruction. This multi-tiered approach aims at preventing inadequate instruction in the general education classroom. Response to Intervention (RTI) also aims at preventing the misdiagnosis of learning disabilities (Stecker, Fuchs, & Fuchs, 2008).

In the RTI framework as described by Gorski (2016), all students participate in general education learning, which is referred to as Tier I instruction. This Tier I instruction is identified as having a powerful, evidence based, high quality core curriculum. Students requiring only Tier I instruction represent 80% of the student population. Students labeled as at risk require additional instruction to provide supplementary support to increase student achievement. Tier I instruction must involve a research based core curriculum that meets the needs of diverse students and be

implemented with fidelity. This is necessary to ensure the instructional techniques and practices have been proven effective (Stecker et al., 2008). Tier II represents 15% of the student population. These students require differentiated instruction in addition to the Tier I instruction they received. These students receive RTI daily for 30 – 40 minutes in a pull out setting. Small groups are made with students that have similar needs for supplemental instruction. When students show little response to the Tier II instruction, they will then be provided with Tier III instruction. Students' receiving Tier III instruction represents 5% of the student population. These students receive a more intensive, individualized instruction for 30 – 40 minutes a day. Tier III can vary between districts. Some districts use Tier III as an additional intervention before the student is referred for testing to receive special education services, while others use Tier III as their special education instruction. In all cases, data collected from multiple measures are used to make decisions on student placement (Fuchs & Fuchs, 2006).

Response to Intervention (RTI) is used as an approach to identify students with learning disabilities. RTI allows teachers to intervene with additional support for struggling students as soon as they begin to demonstrate learning difficulties rather than waiting for them to fail before they receive additional support through special education services (Wixson & Velencia, 2011). RTI attempts to provide students with the highest quality instruction possible before they are identified as having a disability and require additional special education services (Swanson, Solis, Ciullo, & McKenna, 2012).

The implementation of the RTI model can be described through current best practices. According to Hughes and Dexter (2011), these components of best practices include: a scientific based core curriculum, universal screening, progress monitoring, and

decision making about student's progress made throughout the tiers. The decisions are made as to which universal screener and progress monitoring measure will be used and how often to meet for data chats to discuss students' progress at the school level (Averill, Baker, & Rinaldi, 2014). The RTI model ensures that, in Tier I, students are receiving high quality instruction. This eliminates poor instruction as a reason for students not making progress in Tier I. This also aims to reduce the amount of students that are improperly identified as having a learning disability but are rather victims of poor instruction. In 2001, the Commission on Excellence in Special Education reported that many students identified with having a learning disability were labeled as such not because of deficits in their ability but due to ineffective instruction (Hughes & Dexter, 2011). Therefore, the NRP (2000) decided upon the essential components of early literacy instruction that all kindergarten through third grade students must have to be considered a scientifically based curriculum. These early literacy skills are an essential base to early reading success. These five skills are found in all tiers of RTI instruction. All curriculums must have a solid foundation in phonemic awareness, phonics, oral reading fluency, vocabulary, and reading comprehension (NRP, 2000) and provide effective instructional strategies to promote reading success.

Most research on this topic has been on early identification of struggling students and the importance of early implementation of RTI services to students in need. The research discussed in this review will determine why early identification is most beneficial and when it has become too late to close the gaps for struggling students.

RTI as a Prevention Strategy

In previous years, student's IQ scores have been used to identify students who need special education services. Many educators and parents were dissatisfied with the use of an IQ discrepancy assessment that measures intelligence to identify learning disabilities (Fuchs & Fuchs, 2006). This method of identification had several criticisms. According to RTInetwork.org, these include: an over identification of students with learning disabilities, an over representation of minority students in special education, reliability, and variability of identification rates across settings (i.e. states, districts).

Using the IQ discrepancy approach often referred to as the "wait to fail" approach, required students to perform below their IQ score, which, as a result, could take years to happen. This led to waiting for students to fail and fall far behind their grade level and peers before they were given additional support. This approach also did not take into consideration the instruction given to students may not have been high quality. Poor instruction may have led to students not meeting grade level standards. These issues are addressed in the RTI framework. A prevention strategy is used in RTI to catch students before they fall too far behind. Also, it is assumed the instruction students received is high quality and well-developed curriculums are in place.

Bollman and colleagues (2007) studied the effectiveness of the RTI model as an identification tool for special education. Over a 10-year period, placement of students in special education programs dropped from 4.5% to 2.5%. The question did arise asking if after the study was completed, more students were identified as having a learning disability. Response to Intervention (RTI) may have temporarily prevented the placement

into a special education program by helping the students make some progress, and eventually they plateaued and failed to remain performing at grade level.

Proponents of the RTI instructional methods have been validated to be effective in increasing student achievement (Reynolds & Shaywitz, 2009). The students who do not respond to the supplemental instruction through RTI will then be considered to have a learning disability and recommended for a special education placement. A learning disability is defined by Reynolds and Shaywitz (2009) as "an unexpected difficulty in learning in one of seven or so areas of achievement but most commonly occurring in the domain of reading" (p. 12). RTI was created with the conclusion that it would be possible to eliminate this concept of learning disability. Reynolds and Shaywitz (2009) question the validity of using RTI as a diagnostic model stating that instead of the "wait to fail" approach, it waits for a child to fail to respond to the intervention. They conclude that for RTI to be an effective intervention, the lessons need to be individually tailored to each student in order to improve student achievement.

The primary goal of RTI is to improve achievement for struggling students. Providing these students with additional daily instruction allows them extra time to perform their grade level expectations. This, as a result, lessens the amount of special education referrals inferring that these students who showed improvement do not have a disability, and that they just required extra support. The secondary goal of RTI is to provide data for the identification of learning disabilities in students. RTI is used as an early prevention strategy for the students to prevent the amount of unnecessary special education referrals.

Assessments in RTI

The International Reading Association (IRA) created a Commission on Response

to Intervention to provide guidance to professionals as they developed and implemented

approaches to RTI (Wixson & Valencia, 2011). A key guiding principle for educators

included assessments of language and literacy in RTI. IDEA (2004) states that data based

documentation of repeated assessments of achievement at reasonable intervals are

required for RTI assessments. IDEA does not require specific assessments to be used, but

it does require the collection of data that will be used to identify students' needs and

assess their progress.

The data collected in RTI serves multiple purposes. By using different methods of

data collection for different purposes, it can increase efficiency and use of the assessment

results (Wixson & Valencia 2011). The multiple assessment measures in RTI required

within IDEA (2004) include: screening, diagnostics, formative progress monitoring,

benchmark progress monitoring, and summative outcome assessment. These assessment

terms are defined as follows; *Screening* is the data that is initially collected to identify

students who are at risk by achieving below their grade level expectations. This data

helps determine which students need additional interventions. *Diagnostics* is an

assessment that identifies the students' needs and also their strengths. These are given

individually and are usually given to the lower performing students. These include

running records, reading inventories, oral reading fluency assessments, and universal

screeners. *Formative progress monitoring* is the data collected to determine if the student

is progressing with the current type of instruction they are receiving. These include

teacher made assessments, class work, and observations. This type of assessment allows

the teacher to see where the student is performing based on current instruction. *Benchmark progress monitoring* collects data at certain times throughout the year. This data is used to determine if the students are making progress at their grade level. Progress monitoring follows the students' progress to track if it is increasing as it should be. *Summative outcome assessments* are data collected at the end of the year to determine if grade level expectations have been met. Collecting and using the data from these assessments complies with the law by tracking students' progress, identifying their needs, and individualizing their instruction based on assessment results. This process is documented and discussed by educators and administration as seen below in Figure 3.
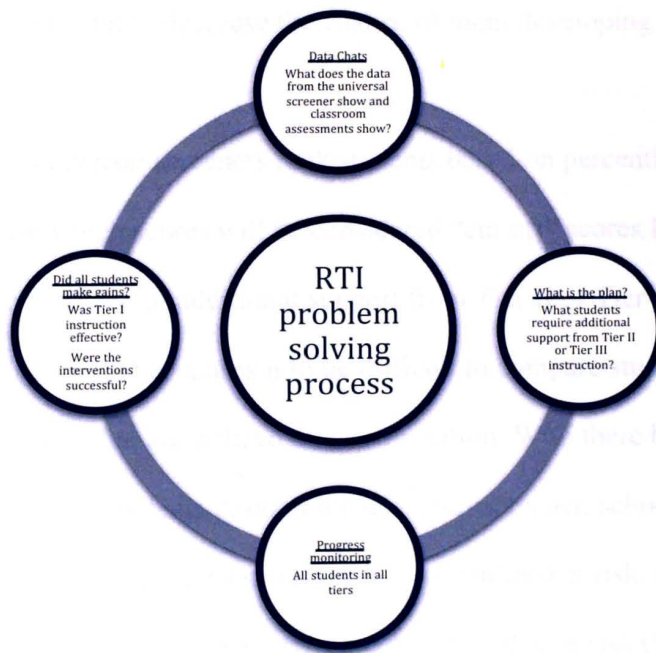

Figure 3. The RTI problem solving process.

Universal screening is the initial assessment students receive to identify them for being at risk of having a learning difficulty. It aims to target students who are struggling after they have been receiving high quality instruction in Tier I (Hughes & Dexter, 2011).

The Universal screeners are administered three times a year, generally the beginning, middle, and end of a school year. Universal screening measures are brief assessments of skills that will predict the outcomes of students' progress. The universal screeners assess students' skills in early literacy development. This type of screening allows for a quick identification and separation of students that require additional support and students who do not (Hughes & Dexter, 2010). Early literacy skills are assessed to determine if students are in need of additional evidence based instruction through Tier II or Tier III interventions. The universal screener is an essential tool for teachers to identify at risk students and provide them with the supplemental support they need to close the deficits they have academically and to decrease the chance of them developing a learning disability.

Scores from universal screeners rank students based on percentiles. There is not a current consensus on which scores will be considered "cut off" scores for identifying at risk students that are in need of additional support from Tier II or Tier III instruction (Hughes & Dexter, 2010). This causes it to be difficult to compare students and the different screening tools that are utilized across the nation. With there being no uniform way of identifying at risk students through the universal screener, schools establish percentile criterion to identify students who will be considered at risk. Generally, the students that score below the 25th percentile are designated as at risk (Fuchs & Fuchs, 2006).

Continuously using progress monitoring as a tool for assessment assists in the data collection of results to determine if the instruction the students are receiving is effective. Progress monitoring also allows for the teacher to determine the student's

needs and strengths. This data guides the instructional decision-making that is made in RTI to target struggling student's needs. RTI implements a periodic screening for all students to assess their progress.

Stecker, Lembke, and Foegen (2008) offer a blueprint to educators for progress monitoring implementation. Data from progress monitoring are an important piece to the RTI framework. This blueprint describes five crucial steps in the implementation of progress monitoring to assist educators in doing so effectively. These steps help guide educators to ensure they are being compliant with IDEA (2004) and conducting repeated assessments to track student achievement. A process was created to follow to ensure students who receive supplemental RTI services, as well as those that only receive Tier I instruction, are making progress as a result of their instruction. Stecker and colleagues (2008) guide the decision making process with the following steps.

The first step in the decision making process is to select appropriate measurement materials. IDEA (2004) does not specify the types of measurement materials to use, only that it is a requirement to use multiple assessments to monitor student achievement. In order to correctly identify at risk students, an appropriate progress monitoring tool is required to adequately assess students' progress while receiving RTI instruction. The second step is to evaluate technical features. This assures that the assessment materials that are being used are reliable and valid. Using evidence based effective assessments will ensure educators they can trust the data they receive when tracking students. The third step in the process is to administer and score measures. These must be standardized to allow for reliably tracking student growth and achievement. The fourth step is to use data for goal setting. The data that educators get from progress monitoring students is

very meaningful. It is used to determine if RTI is effectively increasing student achievement. It also assists in individualizing instruction for these students receiving RTI to ensure they are getting what they need. The final step in this blueprint for progress monitoring is step 5: judge instructional effectiveness. This last step allows for educators to follow the rate of progress students make. The continual administration of progress monitoring collects data to determine how students are performing. This data is used to assess the student's overall achievement or lack thereof.

Students are assessed using various methods of progress monitoring in all tiers of RTI. Well-developed progress monitoring tools should include several characteristics to be valid and reliable. These characteristics include: internal consistency, inter-rater reliability, and construct/concurrent validity (Gillam & Justice, 2010). These characteristics ensure the progress monitoring tool used measures similar skills, has a reliability of scores, and correlates with another measure of the same construct. One of the most commonly used tools is the curriculum based measurement (CBM), which is a brief 1-3 minute per child assessment (Stecker, Fuchs, & Fuchs, 2008). This assesses students' oral reading fluency and reading comprehension. Another measure that is often used to assess student's literacy skills is The Dynamic Indicators of Basic Literacy Skills (DIBELS). This also takes 1-3 minutes per child and gives an accurate assessment of their phonemic awareness and fluency skills (Gillam & Justice, 2010).

Progress monitoring is an essential part of Tier I services. The students that only receive Tier I instruction are given a progress monitoring assessment monthly. The data collected from these assessments allows for the teacher to show the students' level of performance and rate of improvement. These data also allow for the teacher to monitor

students' needs. Progress monitoring is beneficial in Tier I because it provides information on all students. Once students have moved to Tier II instruction, it is crucial that their progress is monitored weekly (Wixson & Valencia, 2011). Monitoring students so often in this tier shows how the students are responding to the supplemental instruction they are receiving in Tier II. If the students are responding and progress adequately, they will no longer need Tier II instruction and will be moved back to only receiving Tier I. If the data collected from progress monitoring show the student is not responding to Tier II instruction, then it is sufficiently proven that they require a more intense intervention in Tier III. Monitoring students' progress in Tier III is critical. Students in this tier are progress monitored weekly. It is imperative to assess the students' performance to determine if the intensity of the Tier III instruction is effective (Stecker, Lembke, & Foegen, 2008). If the students make progress, they will move back to Tier II with the goal being to eventually only need Tier I instruction. If the student still does not respond to Tier III intervention, they will be referred for special education services. When students show progress, it can be determined that the instruction they receive is effective and of high quality. Progress monitoring allows educators to prove their students are learning. It also directs instruction on students' needs.

Assessments are an essential part of the RTI framework. Universal screening and progress monitoring in RTI are used to determine academic difficulties in students (Stecker, Lembke, & Foegen, 2008) as well as guide and enhance instruction and promote and improve student achievement. Valid and reliable universal screening and progress monitoring measures are the key to effective instruction, which will lead to the students' academic improvement.

Early Identification of at Risk Students and Implementation of RTI

The RTI model is based on an early identification and prevention of reading disabilities. Early identification of at risk students is crucial in preventing the diagnosis of a reading disability. Students who do not respond to general education classroom instruction can be identified as having a learning or reading disability based on their lack of performance and achievement in the classroom (Catts et al., 2015). The RTI approach identifies at risk students and intervenes immediately to attempt to prevent developmental delays and challenges from being misdiagnosed as disabilities. Many students who enter kindergarten have a limited experience with literacy putting them at risk before they even begin their education. These students typically have less literacy experiences, no preschool experiences, smaller vocabulary, weaker memory, weaker print knowledge, and less social skills (Al Otaiba et al. 2011). A large portion of these students struggle and become at risk for being identified as having a reading disability (Greenwood et al. 2011). Early implementation of RTI will provide these students with the literacy experiences they have lacked prior to coming to school and provide the foundation for becoming a successful reader and student.

A study done by Greenwood et al. (2011) focused on emergent literacy skills in Pre-K. These included preliminary reading precursors that begin to formally develop phonics and conventional reading skills, which included letter naming, letter sounds, and phonemic awareness. Many kindergarteners who begin school are not ready to succeed. If students have not attended preschool, they have not adequately acquired vocabulary, language, and comprehension information needed to begin to learn to read. This study supported the knowledge that students arriving in third grade need to be performing these

literacy skills at grade level. Students who are struggling with reading fluency, language, and comprehension after third grade will continue to struggle which may also lead to a learning disability diagnosis and increased behavior problems.

With this knowledge, the Greenwood et al. (2011) study looked at the students who come to school already at a disadvantage. Early childhood programs are behind the early identification of these struggling students to begin implementing supplemental support in developing reading skills. A total of 619 Pre-K students enrolled in Head Start were studied at the beginning of RTI implementation. These students followed the early childhood RTI framework. This framework differs slightly from the original framework by beginning with a universal promotion base, which promotes a nurturing and responsive caregiving relationship with the student as well as a high quality supportive environment. The next step in the framework targets social and emotional supports for the students. The final step in the early childhood framework of RTI is the tiered intensive interventions, which are similar to the multi-tiered framework of RTI for K-12 students. Parents are involved in all aspects. It was determined that preschool children benefit from an intense level of instruction. This early RTI intervention has proven to be effective for this population of students. The problem noted by Greenwood et al. (2011) was that, because students entering preschool do not have any preliminary reading skills, all students were given the intervention. A measure to accurately differentiate from preschool students performing adequately from those who are not and who may benefit from interventions still needs to be developed to assist in the decision making of who will receive RTI.

Beginning early interventions in kindergarten before students experience a widening gap in early literacy skills is key. A similar study to the Greenwood et al. (2011) was conducted by O'Connor, Bocian, Sanchez, and Beach (2014) on 214 students in kindergarten. The study followed students who were identified as at risk for developing a learning disability and were then provided with additional RTI instruction in Tier II or Tier III. Overall, these students were successful in closing the gaps before they entered first grade. The students who remained at risk continued to receive supplemental RTI instruction in first grade. The students who continued to struggle with literacy skills in first grade fell farther behind grade level, whereas the students who improved their assessment scores were deemed as no longer needing additional instruction in Tier II or Tier III and were achieving at grade level.

O'Connor et al. (2014) also determined that early implementation is better than later, but kindergarten could be too early. Identifying students this early may be problematic because these students have a lack of experience, which may be misinterpreted as being at risk. Students were given benchmark assessments in kindergarten to assess a combination of literacy skills. This assessment tested fluency in initial sounds, letter naming, phonemic segmentation, word identification, and nonsense word fluency. Students who scored below grade level on these benchmarks were identified as needing additional support through RTI. Using these benchmark criteria in kindergarten left 85% of the students requiring RTI. Students in kindergarten may be over selected as requiring additional interventions through RTI. The study also suggested that beginning RTI in first grade may be more cost effective and will continue to have the positive outcomes related to student achievement.

O'Connor et al. (2014) conducted a statistical analysis using the data from first grade benchmark assessments from at risk students who began RTI instruction in kindergarten and from the students who began in first grade. Total reading achievement favored the students who began RTI instruction in kindergarten. The study also concluded that the students who did not begin the interventions until first grade developed more deficits in reading as the demands in the first grade grew from kindergarten. This proved that implementation and interventions provided in kindergarten led to fewer students being screened for a potential reading disability in a higher grade.

The preference for identifying at risk students would take place in kindergarten or first grade, prior to these students developing reading problems or disabilities (Catts, Nielson, Bridges, Liu, & Bontempo, 2015). This allows for interventions to take place and provide opportunities for students to respond to supplemental instruction through RTI. An important part of early identification of struggling students in the RTI framework is the supplemental instruction they will receive in Tier II and Tier III. With this early identification, the students who respond positively to the interventions and increase their performance in class and on assessments will be identified as no longer being at risk and no longer requiring additional RTI instruction. The students who are truly in need of interventions and at risk for being identified as having a learning disability are expected to have little to no response from the interventions (Catts et al. 2015). This ultimately will identify the students requiring special education services.

Findings from Catts et al. (2015) determined that identifying students at the beginning of kindergarten for being at risk for a reading disability proved to be an accurate measure. A group of kindergarten students was assessed in multiple reading

batteries to include phonological awareness and fluency. These assessments identified the poor readers who were then put into RTI groups for additional reading instruction. By the middle of their kindergarten school year, these students showed a positive response to RTI. This early identification and implementation supported and promoted student growth and achievement. Students not showing growth continued to receive RTI instruction and were progress monitored weekly to assess a possible reading or learning disability.

Early identification and immediate interventions allow for students who have responded poorly to Tier I instruction to receive more intensive instruction and for teachers to provide them with additional opportunities to achieve grade level expectations. Al Otaiba and colleagues (2014) conducted a study comparing two groups of first grade students and when RTI instruction was implemented to each. The students who were identified as at risk upon entering first grade were immediately put into Tier II for supplemental instruction. This immediate placement was termed dynamic RTI. The second group of students received typical RTI, meaning they were not provided additional instruction until after they struggled in Tier I and showed slow growth following 8 weeks of Tier I instruction. This study, determined that students who immediately received supplemental RTI instruction made significantly more gains in reading than the students in the typical RTI group. It was concluded that early identification of students' needs and immediate implementation of interventions were proven to provide stronger outcomes in student achievement.

Students who are identified as at risk in early grades generally do not have a learning disability but are instructionally disabled (Fuchs & Fuchs, 2006). This was

concluded after Fuchs and Fuchs (2006) conducted a study of a group of first grade students that received Tier II instruction. These students received an additional 30 minutes of instruction five days a week. Two thirds of these students made enough gains to catch up to their peers and perform on grade level. The remaining students who were still performing in the bottom 25th percentile were determined to have a learning disability, because they did not respond to the supplemental RTI instruction. This research validates the goal of RTI used to differentiate between struggling students that do and do not have a disability.

Research supports early identification of struggling students. The sooner students are identified as being at risk, the sooner they can begin to receive additional support. This early implementation of RTI has proven to be effective in kindergarten and first grade students. These students generally show growth and begin performing at grade level. The students who remain at risk will then be later assessed for having a disability. The RTI framework separates the students needing additional support from the students that truly have a disability.

Gaps in Literature

After reviewing the literature on RTI and student achievement, there seems to be several gaps. Several studies were conducted on early identification in kindergarten and first grade students to close the gaps in student achievement with additional interventions in Tier II and Tier III. Although there were a few studies found on literacy instruction and the RTI model in middle school and high school, there were no studies done on students in middle to upper elementary grades, which include second through fifth grade. Another gap in the literature that was discovered is that there were no studies conducted

that followed students who received early interventions in kindergarten and first grade. These students were performing at grade level by the conclusion of the study, but there is no further literature that followed up on them as they progressed through the grade levels to determine if they were eventually identified as being at risk again or diagnosed with having a learning disability.

RTI instructional interventions may be implemented as deemed fit for each school and their student population. This brings forth challenges and concerns with the effectiveness of this intervention (Sanger, Friedli, Brunken, Snow, & Ritzman, 2012). The studies conducted about RTI do not address the reliability and validity of how the schools or districts being examined delivered and implemented the supplementary RTI instruction.

The current study aimed to determine the effect RTI has on student achievement in second grade. It determined if students who are in need of additional instruction through RTI at this grade level continued to make enough gains academically to achieve at grade level or if the rate of improvement gap decreased, resulting in the need for a special education referral.

CHAPTER III

Methodology

Participants

The participants in the study were 135 students in second grade who attend an elementary school in the southeastern region of the United States. This quasi-experimental study focused on students' benchmark scores in oral reading fluency (ORF) and Maze reading comprehension within the conceptual framework of RTI. The scores from students who only received Tier I RTI instruction and from those who received Tier II and Tier III supplementary RTI instruction were compared for both assessments. The mean age for the participants was 7 years. Additional demographics for participants are listed in Table 1.

Table 1

Demographic Characteristics of the Participants

Gender		Frequency	Percentage
	Male	68	50.3
	Female	67	49.7
Race			
	White	45	33.3
	Black	63	46.6
	Asian	2	0.02
	Hispanic Origin	25	18.5

Participants were chosen as a sample for the study because they were already enrolled in their second grade classes at the school being studied. This was ideal because there was full access to their benchmark scores because the researcher is an employee at this school. All students in second grade participated. Permission to study this sample of students' benchmark scores and RTI enrollment was given by the Institutional Review

Board at the university at which the researcher was attending (Appendix A) and by the School System Research Committee at which the students were attending (Appendix B).

Procedure

All second grade students were required to take the ORF and Maze assessments. There was no random selection in this study; scores from all students in this convenience sample were used. Each class of students was assigned a date and time to be administered the assessments in the school's computer lab during the classes' regularly scheduled computer time. The students were allotted the entire 40 minute period to go through the directions and assessments. Considering the assessments were timed and require a total of 12 minutes to take, this allowed for ample time for students to listen to the directions and complete the practice probes. The students were provided with head phones and a quiet testing environment. Absent students took the assessments at a later date separate from their class. The decision was made by the researcher to use assessment data from the beginning and middle of the year benchmark assessments because they would be a good representation of students' abilities before and after instruction and interventions. The researcher was provided with the assessment scores from the schools' curriculum coach who had compiled and disseminated the data. The data were coded numerically to keep the confidentiality of the students' names. The curriculum coach also provided the researcher with the information regarding students who receive Tier II and Tier III instruction. The researcher was provided with the students' demographic information from the students' teachers.

Instrumentation

The independent variable has two levels, students who receive RTI as additional instruction in Tier II or Tier III and students who only received regular whole group instruction in Tier I and did not receive any supplemental support. This study sought to determine if students who are in Tier II and Tier III increased their scores on the oral reading fluency and reading comprehension benchmark assessments. This study also determines if students who receive only Tier I instruction increased their scores on the oral reading fluency and reading comprehension assessments. This study compared the change in scores between these two groups of students. The covariates in this study were the beginning of the year (BOY) scores for the ORF assessment and the BOY scores for the reading comprehension assessment. These independent variables controlled what the students could score prior to receiving an intervention.

There were two dependent variables in this study. These dependent variables were students' scores from the Path Driver assessment that was administered at the middle of the year (MOY) for ORF and at the MOY for reading comprehension.

Path Driver assessment for reading. Students were assessed using two forms of CBM, ORF and Maze on the Path Driver for Reading assessment. These are computer based, formative assessments that are used to monitor students' literacy development. The ORF assessment tested students' reading fluency by using reading passages at the students' grade level. Students were given three one-minute readings. The passages were presented to the students who then read them into a computer microphone. The ORF assessment was scored by their teacher who listened to the recordings of the passages read aloud and counted the number of words that were mispronounced, omitted,

substituted, or reversed as errors and entered the data into Path Driver. The scores were generated online and results were reported. Reading comprehension was assessed using the Maze assessment. Maze was developed in the 1970s by John Guthrie to determine how well students could read (Shanahan, 2015). This assessment tested students' reading comprehension by using Maze passages that were written at the students' grade level. Maze passages are passages that have every seventh word omitted and replaced with a blank line. The students had three words to choose from to enter into each blank line that best fit in the sentence. The students had three minutes to choose as many correct answers as they could. Students were given three Maze tests administered in a row. The Maze assessments were automatically scored by the computer. The scores were generated online and results were reported.

Statistical Analyses

The independent variable in this study had two levels, students who received RTI as supplemental instruction in Tier II and Tier III and students who did not receive any supplemental instruction as defined in RTI. The samples were independent in that no participant was assigned to both groups. The two dependent variables included students' scores on the MOY ORF assessments and the students' scores on the MOY Maze reading comprehension assessments. The covariates used in this study were the students' scores on the BOY ORF and the BOY Maze reading comprehension assessments. The independent variable is categorical because students either received additional instruction in Tier II and Tier III or they did not. The dependent variables and covariates in this study are continuous because they were scored using a percentile ranking. An analysis of covariance (ANCOVA) was used because of the multi levels of the independent variable

for each dependent variable. A type I error rate of 0.05 ($\alpha = 0.05$) was selected to address each research question. The type I error rate of 0.05 is commonly accepted in educational research as a sufficient level of significance for most studies (Hinkle, Wiersma, & Jurs, 2003).

Assumptions

To ensure this data could be analyzed using an ANCOVA, it was determined certain assumptions were met. It is assumed that:

(1) The dependent variables and covariates are continuous.

(2) The independent variable consists of two or more categorical, independent groups.

(3) Participants are only in one group.

(4) There are no significant outliers.

(5) The data are normally distributed.

(6) The variance is equal for all groups.

(7) The covariate is related to the dependent variable.

(8) There is homoscedasticity (standard deviation).

(9) There is no interaction between the covariate and the independent variable.

Having met these assumptions, the criteria was met for using an ANCOVA to analyze the data. Two ANCOVAs were conducted. One was conducted for the ORF assessment and the other was conducted for the Maze assessment. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) 23.0 software.

CHAPTER IV

Results

The results of this study were organized in two sections to address the two analyses conducted. The first analysis is a between-groups comparison of students' BOY and MOY ORF assessment scores from students who only received Tier I instruction and students who received additional instruction in Tier II or Tier III. The second analysis is a between-groups comparison of students' BOY and MOY Maze reading comprehension assessment scores from students who only received Tier I instruction and students who received additional instruction in Tier II or Tier III.

Oral Reading Fluency Assessment

Descriptive analysis of the covariate and dependent variable. The means, standard deviations, and growth for both the BOY ORF scores (covariate) and MOY ORF scores (dependent variable) scores are listed in Table 2.

Table 2

Descriptive Statistics for the Oral Reading Fluency Assessments

	BOY ORF (Covariate)		MOY ORF (Dependent Variable)			
RTI tier	*M*	*SD*	*M*	*SD*	Growth	*N*
Tier I	62.97	23.46	67.97	22.79	+4.996	114
Tier II or Tier III	28.29	28.77	30.38	28.72	+2.094	21
Totals	57.58	27.33	62.13	27.36		135

Both the covariate and the dependent variable were checked for normality and significant outliers, two more assumptions of an ANCOVA. The distributions of scores on these measures are shown in Figures 4 through 7. An assumption was made that the histograms would show normality. Upon further observation, it showed that there were outliers in BOY and MOY scores. The farthest deviation from the mean occurred in the

MOY ORF assessment where the data point was 99.0 from a student in Tier II or Tier III which was approximately 2.5 standard deviations above the mean for this group.
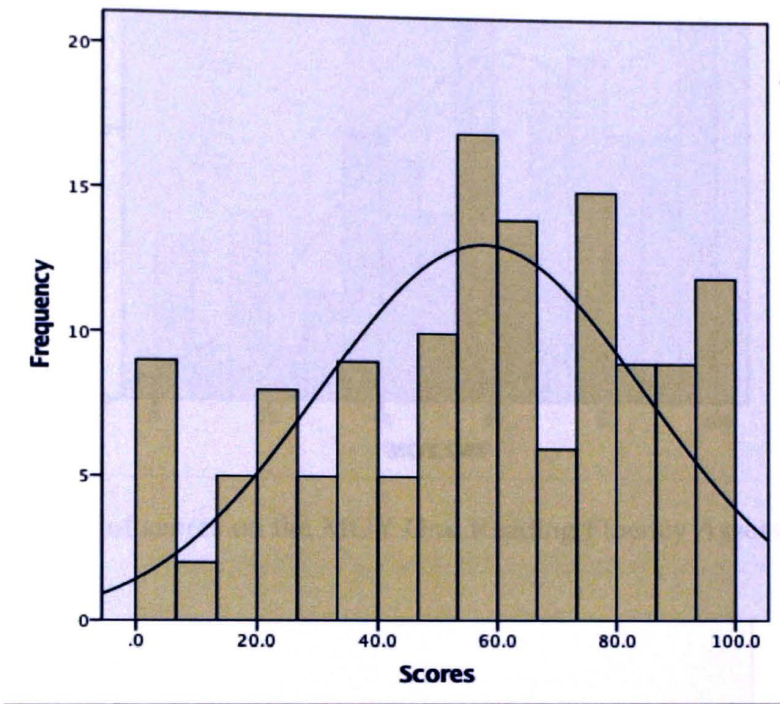

Figure 4. Distribution of scores on the BOY Oral Reading Fluency Assessment from Students in Tier I
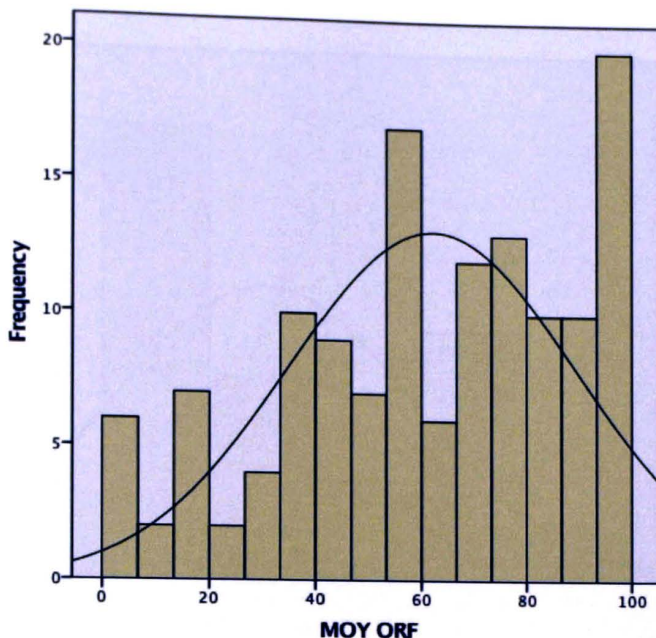
Figure 5. Distribution of scores on the MOY Oral Reading Fluency Assessment from Students in Tier I
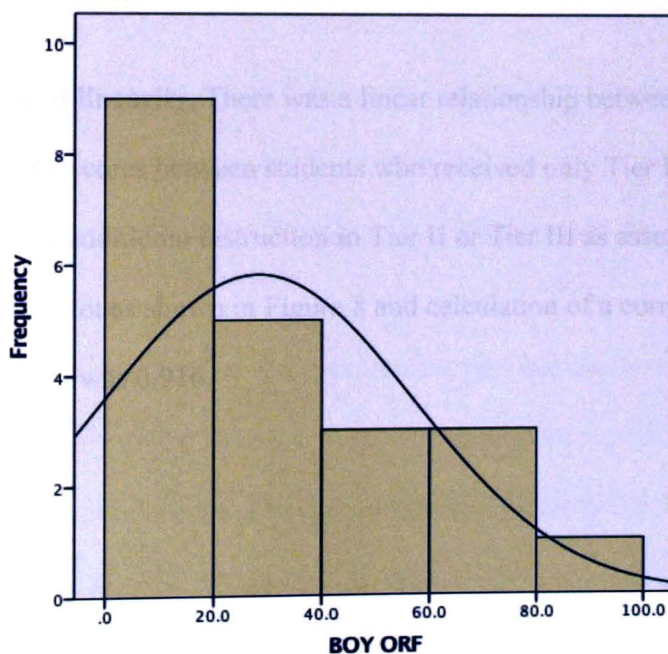

Figure 6. Distribution of scores on BOY Oral Reading Fluency Assessment from Students in Tier II or Tier III
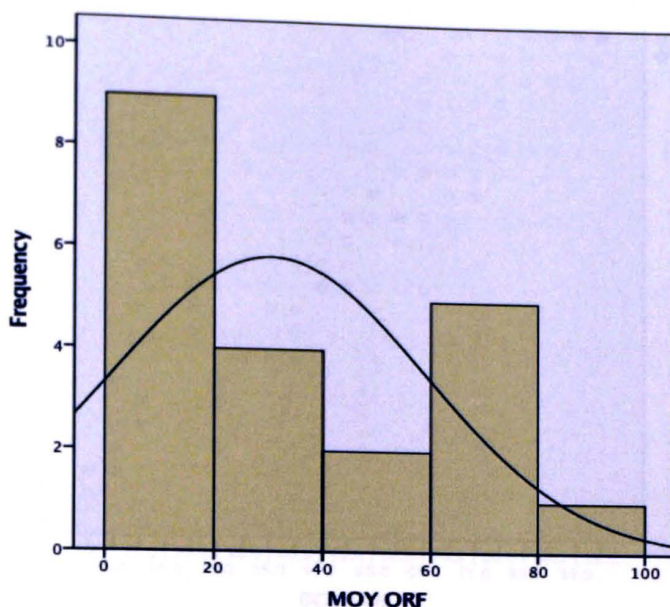
Figure 7. Distribution of scores on MOY Oral Reading Fluency Assessment from
Students in Tier II or Tier III

Assumption of linearity. There was a linear relationship between BOY ORF

scores and MOY ORF scores between students who received only Tier I instruction and

students who received additional instruction in Tier II or Tier III as assessed by visual

inspection of a scatterplot as shown in Figure 8 and calculation of a correlation

coefficient. Pearson's *r* was 0.916.

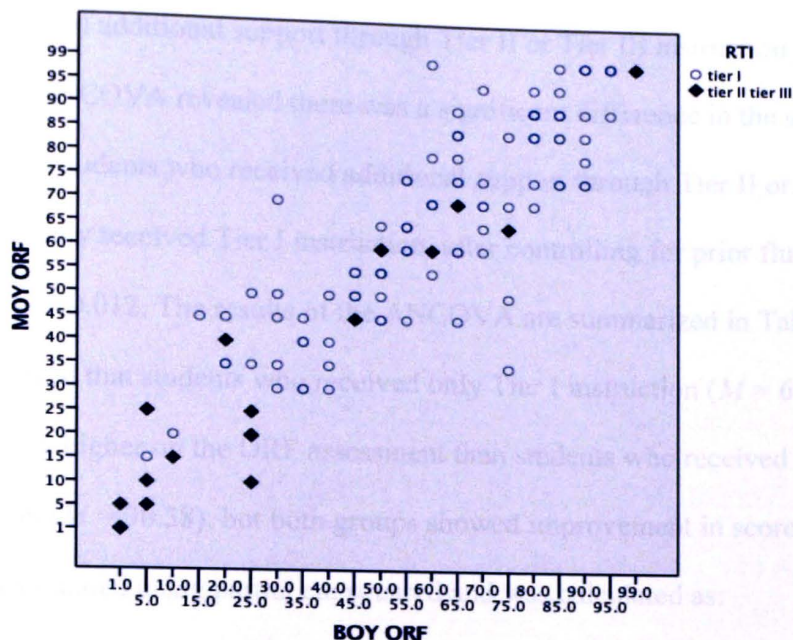*Figure 8.* Linearity between Covariate (BOY ORF) and Dependent Variable (MOY ORF).

Assumption of homogeneity of variances. Levene's Test was used to check the assumption of homogeneity of variance, $F(1,134) = 0.661$, $p = 0.418$, indicating that there was no statistically significant difference in the variances and the assumption was met.

Assumption of homogeneity of regression. A two-way analysis of variance (ANOVA) was used to check the assumption of homogeneity of regression by examining the interaction between the covariate and the independent variable. The result was $F(1,134) = 1.304$, $p = 0.256$. There was no statistically significant difference, thus meeting the assumption.

Results of the ANCOVA. Upon meeting the previous assumptions, a one-way ANCOVA was conducted to determine statistically significant differences between

students who received additional support through Tier II or Tier III instruction and those who did not. The ANCOVA revealed there was a significant difference in the students' scores between the students who received additional support through Tier II or Tier III and students who only received Tier I instruction, after controlling for prior fluency, $F(1,132) = 6.48$ $p = 0.012$. The results of the ANCOVA are summarized in Table 3. These results showed that students who received only Tier I instruction ($M = 67.97$) scored significantly higher on the ORF assessment than students who received Tier II or Tier III instruction ($M = 30.38$), but both groups showed improvement in scores. An effect size was calculated using partial eta squared and was calculated as:

$$\eta_p^2 = \frac{df\text{effect X F effect}}{(df\text{effect X F effect}) + df\text{error}}$$

Using the results from this calculation, as suggested by Cohen (1988), the effect size was determined to be small ($\eta_p^2 \leq .03$), medium ($.03 < \eta_p^2 \leq .06$), or large ($.06 < \eta_p^2 \leq .10$). Accordingly, an effect size of $\eta_p^2 = 0.919$ was determined to be a large effect size.

Table 3

Analysis of Covariance Summary for Students' ORF scores

Source	SS	df	MS	F	p	η_p^2
Covariate (BOY ORF)	59850.4	1	59850.34	514.35	0.000	0.764
Supplemental Instruction	754.1	1	754.13	6.48	0.012	0.919
Error	15359.5	132	116.36			
Total	621321	134				

Maze Reading Comprehension Assessment

Descriptive analysis of the dependent variable and covariate. The means standard deviations, and growth for both the BOY Maze assessment scores (covariate) and MOY Maze assessment scores (dependent variable) are listed in Table 4.

Table 4

Descriptive Statistics for the Maze Reading Comprehension Assessments

RTI tier	BOY Maze (Covariate)		MOY Maze (Dependent Variable)			
	M	*SD*	*M*	*SD*	Growth	*N*
Tier I	67.044	24.405	81.68	20.590	+14.636	114
Tier II or Tier III	57.048	24.553	59.48	22.371	+2.432	21
Totals	65.489	24.606	78.23	22.304		135

Both the covariate and the dependent variable were checked for normality and significant outliers, two more assumptions of an ANCOVA. The distribution of scores on the Maze reading comprehension assessments are shown in figures 9 through 12. An assumption was made that the histograms would show normality. Upon further observation, it is shown that there are outliers in BOY and MOY scores. The farthest deviation from the mean was the data point of 96 for the covariate. This score deviated approximately 1.5 standard deviations from the mean for that group.
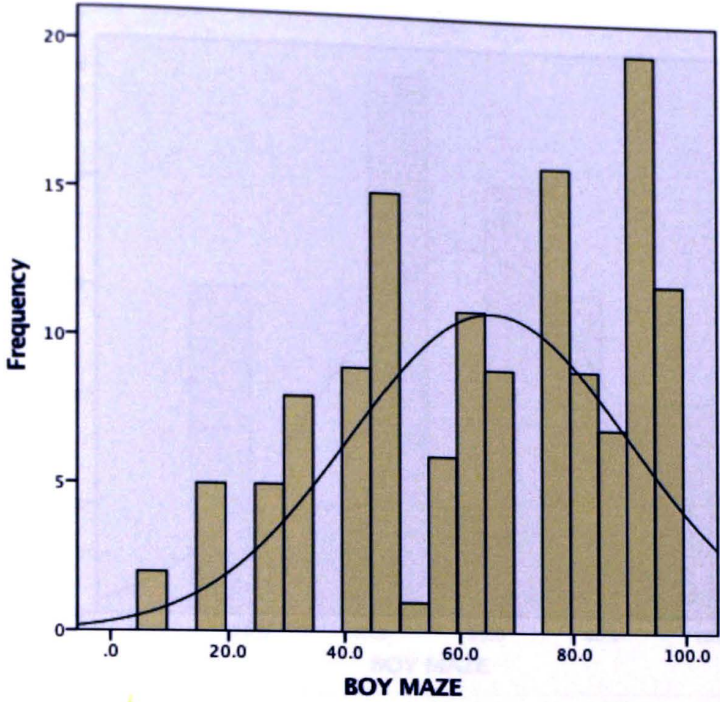
Figure 9. Distribution of score on the BOY Maze Reading Comprehension Assessment from Students in Tier I
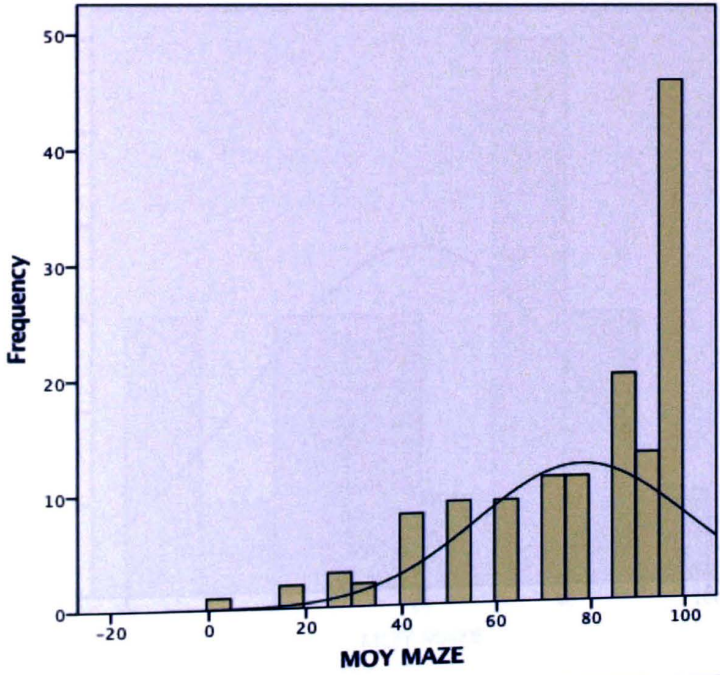

Figure 10. Distribution of score on the MOY Maze Reading Comprehension Assessment from Students in Tier I
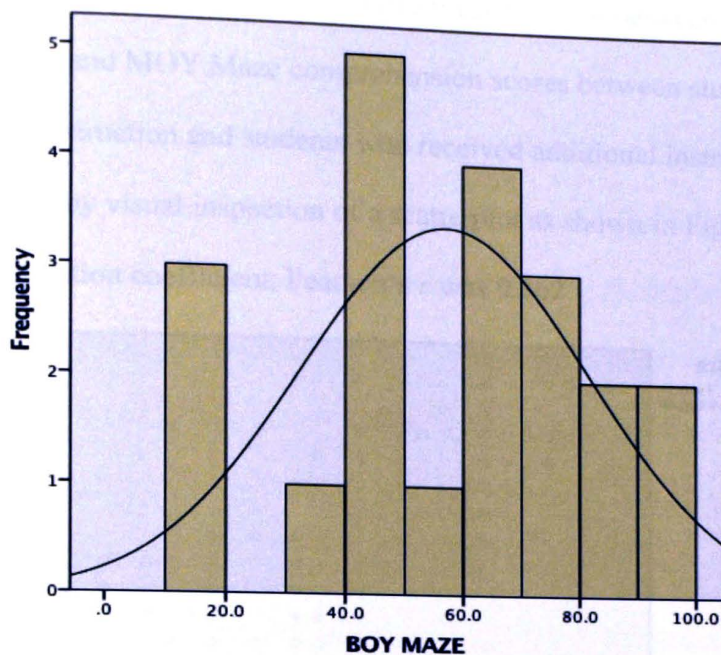
Figure 11. Distribution of scores on BOY Maze Reading Comprehension Assessment from students in Tier II or Tier III
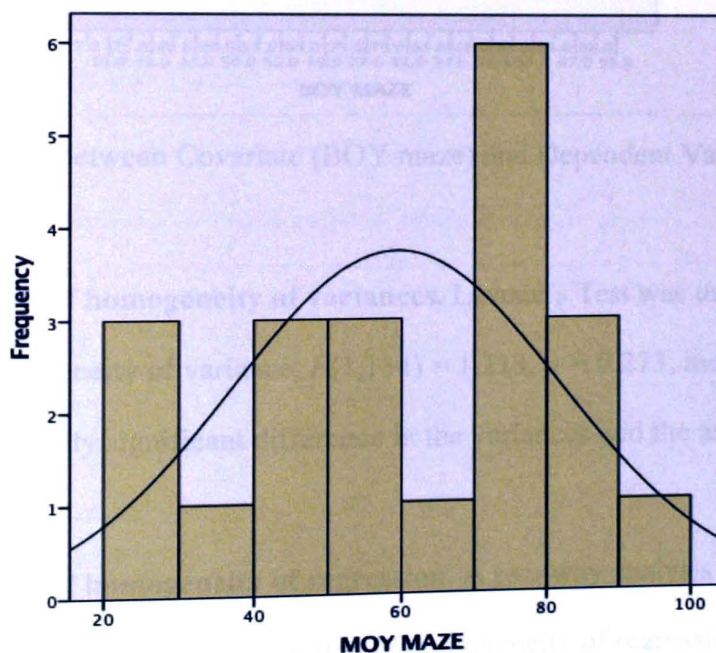

Figure 12. Distribution of scores on MOY Reading Comprehension Assessment from students in Tier II or Tier III

Assumption of linearity. There was a linear relationship between BOY Maze comprehension scores and MOY Maze comprehension scores between students who received only Tier I instruction and students who received additional instruction in Tier II or Tier III as assessed by visual inspection of a scatterplot as shown in Figure 13 and calculation of a correlation coefficient. Pearson's r was 0.362.
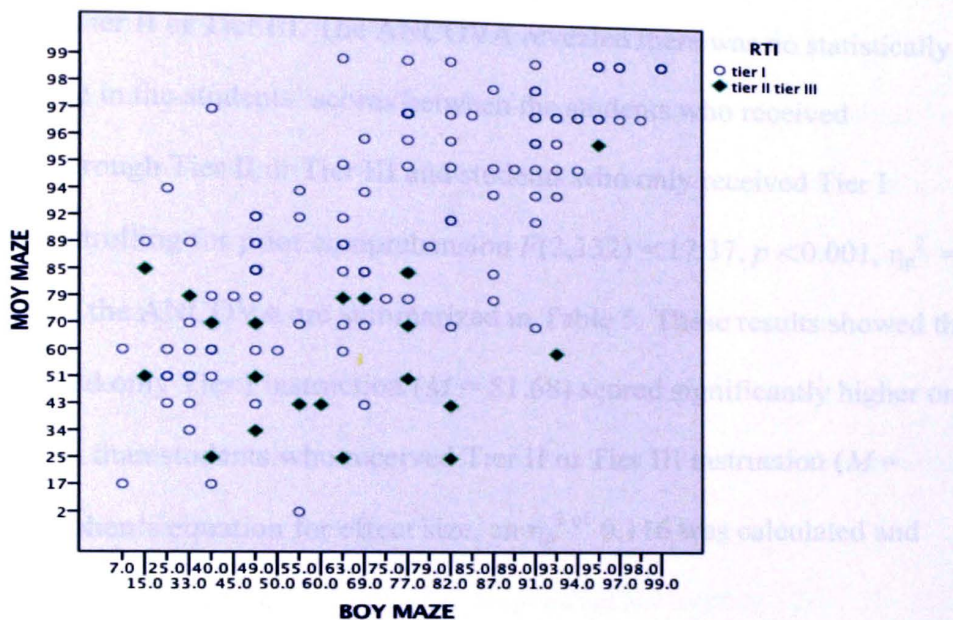
Figure 13 . Linearity between Covariate (BOY maze) and Dependent Variable (MOY Maze).

Assumption of homogeneity of variances. Levene's Test was used to check the assumption of homogeneity of variance, $F(1,134) = 1.213, p = 0.273$, indicating that there was no statistically significant difference in the variances and the assumption was met.

Assumption of homogeneity of regression. A two-way analysis of variance (ANOVA) was used to check the assumption of homogeneity of regression by examining the interaction between the covariate and independent variable. The result was $F(1,134) =$

2.970, $p = 0.087$. There was no statistically significant difference, thus meeting this assumption.

Results of the ANCOVA. Upon meeting the previous assumptions, a one-way ANCOVA was conducted to determine statistically significant differences between students who only received Tier I instruction and those who received additional instruction through Tier II or Tier III. The ANCOVA revealed there was no statistically significant difference in the students' scores between the students who received additional support through Tier II or Tier III and students who only received Tier I instruction, after controlling for prior comprehension $F(2,132) = 17.37, p < 0.001, \eta_p^2 = 0.116$. The results of the ANCOVA are summarized in Table 5. These results showed that students who received only Tier I instruction ($M = 81.68$) scored significantly higher on the Maze assessment than students who received Tier II or Tier III instruction ($M = 59.48$). Using the Cohen's equation for effect size, an η_p^2 of 0.116 was calculated and determined to be a large effect size.

Table 5

Analysis of Covariance Summary for Students' Maze scores

Source	SS	df	MS	F	p	η_p^2
Covariate (BOY Maze)	17457.35	1	17457.35	56.96	0.000	0.301
Supplemental Instruction	5324.13	2	5324.13	17.37	0.000	0.116
Error	40458.52	132	3.06.50			
Total	892845	135				

CHAPTER V

Discussion

RTI and Effects on Students' Oral Reading Fluency Scores

The research question sought to find the effect of supplemental instruction from RTI in Tier II or Tier III on second grade students' oral reading fluency benchmark scores. The corresponding research hypothesis was that second grade students who receive supplemental instruction through RTI in Tier II or Tier III will increase their benchmark scores on oral reading fluency. The first hypothesis that students who received additional interventions would increase their oral reading fluency scores was supported because a statistically significant difference in scores was found with a 5% chance that this difference was due to sampling error. Both groups of students showed improvement in scores. Students receiving only Tier I instruction improved the mean of their scores as well as students who received Tier II or Tier III interventions.

RTI and Effects on Students' Maze Reading Comprehension Scores

The second research question sought to find the effect of supplemental instruction from RTI in Tier II or Tier III on second grade students' Maze reading comprehension benchmark scores. The corresponding research hypothesis was that second grade students who receive supplemental instruction through RTI in Tier II or Tier III will increase their benchmark scores on reading comprehension. The second hypothesis was supported because a statistically significant difference in scores was found with a 5% chance that this difference was due to sampling error. Both groups of students showed improvement in scores. Students receiving only Tier I instruction improved the mean of their scores as well as students who received Tier II or Tier III interventions.

Conclusions for Effectiveness of Tier II or Tier III in Second Grade

This study supported the claim that students who receive additional instruction through interventions in Tier II or Tier III will improve their oral reading fluency and reading comprehension scores, but considering the low rate of improvement, it can be argued that these students would have increased their scores with only receiving Tier I instruction. The significant increase in students' scores in Tier I confirmed the instruction was effective and of high quality. This finding indicates that additional research should be conducted on these students in third grade to determine if and when they are identified as having a learning disability. Based on the low rate of improvement from students in Tier II and Tier III, it can also be argued that second grade is too late to close the achievement gaps through additional interventions in RTI. As concluded by a study from Beach and O'Connor (2015) students who continue to make improvements but perform below grade level in third grade is an indicator of a learning disability. The students did show some improvement but not enough to perform at grade level. The students in Tier II and Tier III had a significantly low rate of improvement. Therefore, it can be concluded that these students may have a learning disability and require more individualized instruction through special education services. This is a generalization that can be made based on the results of this study, but it is also noted that not all students who received Tier II or Tier III interventions showed a low rate of improvement.

This study suggested that students who struggle with reading and still do not receive early interventions will be diagnosed with having a learning disability. Early identification of at risk students is crucial in preventing the diagnosis of a reading disability. Students who do not respond to Tier II and Tier III instruction can be identified

as having a learning or reading disability based on their lack of performance and achievement in the classroom (Catts et al., 2015) and on assessments. It is possible that the types of interventions used were not effective, but that cannot be concluded in this study.

Implications for Intervention Policy

As stated previously, IDEA (2004) does not require specific assessments to be used, but it does require the collection of data that will be used to identify students' needs and assess their progress. Studies conducted about RTI do not address the reliability and validity of how the schools or districts delivered and implemented the supplementary RTI instruction. There currently is not a uniform model of interventions to use during Tier II and Tier III instruction. In order for RTI to become universally comparable, all measures of instruction and assessment should be uniform. If the assessments and interventions were mandated to be the same effective research based tools, then it could be concluded that all results would be reliable and valid. Also, results from different studies regarding the RTI tiers of instruction and intervention would be more comparable. In the future, a policy used to differentiate between students who are performing below grade level and students who have a learning disability needs to be established to better serve and identify both of these groups of students.

Future Research

Many other potential studies can be done on RTI and its effectiveness on student achievement. The study warrants to be repeated with a larger, more diverse population of second grade students from different schools to see if the results were similar. Also, because most studies that have been conducted on the effectiveness of supplemental

interventions use populations of students in pre kindergarten, kindergarten, and first grade, studies could also be conducted on students from grades three through five for elementary students as well as students in middle school and high school.

In the future, the interventions used in Tier II and Tier III need to be studied to determine their reliability and validity before students' scores after receiving these interventions are studied. The potential studies could improve upon the current study by providing more substantial evidence that the interventions were effective forms of instruction. Because of the timeframe for completion, it was not feasible to also compare students' end of the year scores on the oral reading fluency and reading comprehension assessments. Comparing these scores would have given insight to how the students performed after receiving an entire school year of additional interventions.

In conclusion, both hypotheses in this study were supported, however, the students in Tier II and Tier III did not have a significant rate of improvement compared to students in Tier I. Students who received supplemental interventions through RTI in Tier II and Tier III continued to make improvements in second grade, but did not make enough gains to perform at the level of their peers. This indicated that the students who are identified as at risk in second grade and received supplemental instruction continued to be at risk. It is then concluded that these students require additional testing to determine if they have a learning disability. Early identification of struggling students is key. Based on the results from previous studies on students in kindergarten and first grade, it can be concluded that, as the students increase grade levels and more is expected of them, their rate of improvement decreases. Supplementary interventions through RTI are successful, but methods for creating proficiency within the delivery, instruction, and

assessments of the interventions need to be further researched to improve on the

effectiveness of RTI. RTI has proven to have a positive effect on student achievement,

but this study indicates that students in second grade who need additional interventions

may have a learning disability.

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Appendix A

Institutional Review Board Approval

**AUSTIN PEAY STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD**

Date: 2/9/2016

RE 16:005: The Effectiveness of Response to Intervention (RTI) on Improving Student
Achievement on Second Grade Benchmark Assessments

Dear Deanna Carr,

We appreciate your cooperation with the human research review process. This letter is to inform
you that study 16-005 has been approved, and meets the criteria for exemption from further
review. Exemption is granted on the basis of 45 CFR 46.101(b)(2). You are free to conduct the
study at this time.

This approval is subject to APSU Policies and Procedures governing human subject research.
The IRB reserves the right to withdraw approval if unresolved issues are raised during the review
period. Any changes or deviations from the approved protocol must be submitted in writing to
the IRB for further review and approval before continuing. This approval is for one calendar
year. The expiration date is 2/9/2017. If you have any questions or require further information,
you can contact me by phone (931-221-7506) or email (butterfield@apsu.edu).

Sincerely,

Jonniann Butterfield, Ph. D. Chair, APIRB

Appendix B

Clarksville Montgomery County School System Research Committee Approval
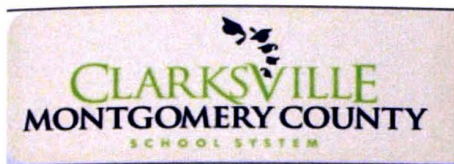
From:	Dr. Kimi Sucharski	2.10.2016
	CMCSS Accountability	
	612 Gracey Ave	
	Clarksville, TN 37040	

To: Deanna Carr

Subject: Request to Conduct Research in CMCSS

The Clarksville Montgomery County School System Research Committee has met and approved your request to conduct research in the District examining the impact of RTI TIER intervention with 2nd grade students.

Sincerely,

Dr. KL Sucharski

Dr. Kimi Sucharski
CMCSS Accountability and Assessment
Kimi.sucharski@cmcss.net
(931) 920-7813 office