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## Sustained Effects of Intensive Reading Intervention: Can Intensive Intervention Gains Made in Primary Grades Be Maintained Through the End of Elementary School?

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Sustained Effects of Intensive Reading Intervention: Can Intensive Intervention Gains

Made in Primary Grades Be Maintained Through the End of Elementary School?

By

Jolene J. Johnson

A DISSERTATION

Presented to the Faculty of

The Graduate College at the University of Nebraska

In Partial Fulfillment of the Requirements

For the Degree of Doctor of Education

Major: Educational Administration

Under the Supervision of Dr. Kay Keiser

Omaha, Nebraska

May, 2014

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Sustained Effects of Intensive Reading Intervention: Can Intensive Intervention Gains  
Made in Primary Grades Be Maintained Through the End of Elementary School?

Jolene J. Johnson, Ed.D.

University of Nebraska, 2014

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The purpose of this research study was to determine the effects of an intensive reading intervention provided to students in primary grades (kindergarten-second grade). A cohort of 400 students was followed from kindergarten through fifth grade to determine reading achievement effects as students progressed through school. Scores from third and fifth grade reading assessments were used to evaluate the short-term and long-term effects of a district-developed program. Effects of the program were examined as they related to students who exited the intervention successfully, those who failed to exit the intervention and for those never needing intervention.

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## **Table of Contents**

Table of Contents	iv
Abstract	ii
Acknowledgements	iii
List of Tables	vi
Chapter 1 Introduction	1
Background	1
Theoretical or Conceptual Framework	2
Problem Statement	8
Research Questions	9
Definition of Terms	10
Assumptions	11
Limitations	12
Delimitations	12
Significance of the Study	12
Outline of the Study	13
Chapter 2 Review of Literature	15
Chapter 3 Methodology	27
Brief Overview	27
Design	27
Research Questions	28
Participants	28
Instruments	30

Procedures	31
Data Analysis	32
Chapter 4 Results	33
Chapter 5 Discussion	40

List of Tables

Table 1

Table 2

## CHAPTER 1

### Introduction

Response to Intervention (RtI) exploded in the late 1990's and early 2000's as the bandwagon to jump on and the flag to carry in the world of education, particularly special education. The promises of using an RtI process were fewer students in special education, reaching at-risk students before they had failed for multiple years, strengthening core instruction, the use of data-based decision making and an increased validity in placing students into special education (National Association of State Directors of Special Education (NASDSE), 2005). Those students who were eventually identified as needing special education services would be there not due to a discrepancy based, wait to fail model, but rather due to a pattern of minimal responses to instruction and evidence-based interventions. Students with low average IQ scores would not be denied special education services merely because they failed to meet the required fifteen or twenty point differential between their IQ and achievement scores. Instead, a school team would be able to examine multiple points of data including how a student responded to multiple levels of intervention (NASDSE, 2005). The promise of RtI was that all students who needed intervention would receive the support and instruction needed, as well as receive interventions proven to remediate academic and behavioral skills. Those intervention services would be available as soon as students entered school, providing an opportunity for more immediate skill remediation before a student had the opportunity to fall further behind.

A growing body of evidence indicates that providing early literacy/reading

intervention services may be key in reducing the number of students at-risk for later reading failure and the number of students in need of special education services (Bursuck & Blanks, 2010; Coyne, Kame'enui, Simmons, & Harn., 2004).

Increasingly, these reading interventions are part of a tiered model of intervention services using a Response to Intervention (RTI) framework. While early reading interventions may vary by group size, length of intervention and frequency of intervention services (Vaughn, Linan-Thompson, Hickman, 2003; Vaughn et al., 2009; Wanzek & Vaughn, 2008), the interventions largely focus on the five big areas of reading as defined by the National Reading Panel (2000). The five areas are phonological awareness, fluency, vocabulary, comprehension and phonics. Response to Intervention framework has evolved over the last several years from an alternative way to verify students for special education into an instructional framework in which the emphasis is on excellent classroom instruction for all students and supplemental interventions for students in need (Bursuck & Blanks, 2010; Fuchs, D., Fuchs, L., & Compton, 2012).

### **Conceptual Perspective**

A key feature of the Response to Intervention framework is the use of a tiered system of identification and supports (Lembke et al., 2010; NASDSE, 2005). In a tiered system, all students participate in the first tier (also referred to as Tier 1) through general education classroom instruction and regularly scheduled universal screening. Students identified through a screening process are placed in increasing levels of instructional support based upon their need. The tiers are fluid in nature in that students can move back and forth between tiers as they show progress or lack

thereof (Fuchs, D. et al., 2012).

A second feature of the framework is the emphasis on data-based, decision making processes. In an RtI framework, all students are typically screened multiple times a year to determine who meets the criteria to receive supplemental interventions and additional supports. At a systems level, data may be used to evaluate the effectiveness of core classroom instruction. If a screening measure identifies too many students in a particular school, grade or classroom, this indicates that the core instruction is not sufficient to meet the needs of the learners present and needs to be adjusted or changed completely. When that occurs, a building may need to improve the core curriculum instruction before entering students into intensive interventions (Simmons et al., 2000).

Once students are in an intervention, they are progress monitored on a frequent basis, weekly to multiple times per week, to determine if the intervention is being effective and if the student is responding as expected (NASDSE, 2005). If the data indicate a student is not showing enough of a response, the intervention may need to be changed, implemented for a longer period of time or the student may need to move to a tier with more intensive supports. If a student continues to show a pattern of minimal response to an evidence-based intervention(s) over a period of time, he/she may be referred for a special education evaluation. Within that special education evaluation, data gathered from the screenings, progress monitoring and comparisons to typical responders should be used in determining if a student does have a learning disability in the area of reading (Lembke et al., 2010). However, “RTI serves to prevent as many children as possible from developing academic difficulties

and/or disabilities, as well as to identify those truly in need of highly specialized intervention” (Lembke et al., 2010, p. 23).

The RTI framework will not work without effective core classroom instruction and evidence-based reading interventions. Imperative in the model is having a rigorous reading curriculum that is sufficient in meeting the instructional needs of 75-85% of the student population (NASDSE, 2005; Simmons et al., 2000). Second, the interventions selected and/or developed for implementation must be evidence-based and delivered with fidelity. In the area of reading instruction, five areas of reading or “Big Ideas” should be within both the core instruction and supplemental interventions. Those areas are: phonemic awareness, phonics/alphabetic principle, reading fluency, vocabulary and reading comprehension (NELP, 2008; NRP, 2000). These areas of reading are considered necessary for providing effective reading instruction. One purpose for the current research project is to determine the effectiveness of the intervention supports provided at a district-level using the Response to Intervention framework.

The district developed its initial Response to Intervention plan in 2004-2005 to address kindergarten through second grade reading. The planning was approached as a component of the district’s language arts and early literacy reading programs, not solely as a special education initiative. The Assistant Superintendent for Curriculum and Instruction served as the chair of the district planning team, which also included the directors of elementary education, staff development, and special services. Based on a model proposed by Simmons et al. (2000), the district team worked to construct

a model integrating the district's current literacy practices with what was indicated by a model of best practices.

The developed plan called for benchmarking all students in kindergarten through second grade in the fall, winter and spring by a team of reading teachers and school psychologists. Benchmarking measures used were from the AIMSweb assessment system and included measures of early literacy and oral reading fluency. To increase inter-rater reliability the same assessment team administered the benchmark probes in each of the elementary schools using the standardized directions and scoring. In addition to the standardized AIMSweb probes, data were collected on the district's portfolio measures including phonemic awareness measures, alphabet recognition, measures of high frequency words and Rigby Reading Levels.

After assessing all students the district established local district norms and used those to set intervention entrance and exit criteria. Following each of the three screening assessment sessions, meetings were conducted in each elementary school to reach decisions about which students would receive the intensive reading intervention and which students met exit criteria. The building decision-making teams were led by the school's principal and included kindergarten, first, and second grade classroom teachers; the school psychologist; a certified reading teacher; the District Coordinator of Special Education; and the District Reading Interventionist.

Decisions were made about students' need for intensive intervention based on results from the multiple assessments used in the testing sessions, as well as teacher judgment and classroom performance. Including teacher judgment in the decisions, and the fact that there were multiple assessments, resulted in some subjectivity in the

decision-making process. To provide consistency of entrance and exit rates across the district's 10 elementary schools, the elementary coordinator of special education and the district reading interventionist participated in the decision-making meetings in each of the 10 elementary schools. Generally, students scoring at or below the 16<sup>th</sup> percentile using local norms, on one or more of the assessments were considered eligible for intensive intervention.

### **Intervention**

Based on previous research (Vaughn et al., 2003), the district's Early Literacy RtI plan required that a certified reading teacher provide 25 minutes of intensive reading instruction each day to all intervention students in small groups consisting of no more than four students. Identified students received 45, twenty-five minute instructional sessions between the fall and winter testing and, if necessary a second set of 45 sessions between the winter and spring testing. The plan called for a minimum of two 45-day sessions prior to MDT referral, although as described later in this article some students who did not qualify for exit from intensive intervention at the end of two sessions, continued with the reading teacher for additional sessions, rather than being referred. Students in this cohort would have had the option of participating in six intensive reading intervention sessions.

The fact that the intensive intervention was provided by teachers specializing in reading necessitated some major changes in reading teacher staffing. In the past, reading specialists had been assigned to buildings based on total enrollment, with some additional support in the district's Title I elementary schools. Because of the dramatic differences in the socio-economic composition among the district's

elementary schools, some buildings had been able to provide reading teacher services to students performing in the average range, while other schools only had enough reading staff time to serve students who were reading well below average. There was a clear need for greater equity of service across all elementary schools. The district planning team made the decision to staff buildings with reading teachers based on the number of students identified for intensive intervention through the RtI identification process. Reading teacher assignments were not made until after the fall testing and building decision-making meetings were completed. Reading teacher assignments were re-evaluated after the winter assessments and the building decision-making meetings.

An initial internal evaluation of the program was conducted in 2009-2010. This internal evaluation found the intervention to be highly effective for most students. Students who had received intensive reading intervention for at least one session during their k-2 years and had exited the program obtained a mean end of the year Rigby Reading level at the national 50<sup>th</sup> percentile. Results indicated that the intensive reading intervention had effectively closed the gap for those students as they headed into third grade. For students who hadn't met exit criteria, the gap between them and their peers had grown larger even with the intensive intervention. While they had made continued progress, the progress was not at a pace needed to catch up with their grade level peers.

### **Intervention Effectiveness: Short-term and Long-term Effects**

What wasn't determined by the internal evaluation was if students experienced any long-term effects once they exited the intervention program. The

internal evaluation, like many research studies, ended once students entered into third grade. Given the recent nature of RtI, most studies have focused on the short-term impact of intervention services. Multiple studies (Coyne et al., 2004; Fuchs et al., 2008, Vaughn et al., 2003; Klubnik & Ardoin, 2010; Scanlon et al., 2008) have found significant positive effects within a school year or from one year to the next, but few studies have followed the students across their school careers to determine if the impact of early intervention carries over in to the intermediate grades and beyond. Coyne et al. (2004) followed students from kindergarten through first grade and found that for those students classified as strong responders to the kindergarten intervention, they maintained those gains in first grade and did not need supplemental intervention.

However, the same was not true for students whose response to the intervention was not adequate. Those students continued to need intervention in first grade, indicating a need for a different or more intense intervention than what was provided in kindergarten. Similarly, a longitudinal study of first grade student (Fuchs et al., 2008) who received nine weeks of intervention during first semester of first grade demonstrated maintenance effects up until the end of second grade for those students deemed responsive to the intervention. The students were not followed beyond their second grade year, thus, the effects of the intervention beyond second grade is unknown.

The purpose of the evaluation was to determine the long-terms effects of an early, intensive reading intervention by examining students' third and fifth grade reading scores on the Stanford Achievement Test- Tenth Edition (SAT10) and the

Nebraska State Reading Assessment (NeSA-R). The evaluation examined any difference between the groups of students (ones who never received intervention, those who exited intervention, and those who didn't exit intervention) on reading achievement based on their third and fifth grade scores. The results from the evaluation could help the district shape and change the reading intervention process if necessary. Results from this evaluation can be used for both summative and formative purposes. The information may be used to examine overall effectiveness of the intervention process by examining both short-term and long-term effects on student reading achievement. Formatively, it could help determine if all the components of the reading intervention are essential to effectiveness. Given that the intervention provided is costly to the district, as it is staff intensive, it needs to show impressive results. If not, there may be less costly interventions that could produce similar results. Finally, the research could add to the research base in the area of long-term effects of early reading interventions.

### **Research Questions**

1. What were the effects (both short and long term) on reading achievement for the students who received intensive reading intervention based on their third and fifth grade reading scores?
2. Were the reading achievement gains made in the intervention program sustained after students exit and if so, how long are those gains maintained?
3. Did the students who exited from reading intervention continue to differ significantly from those who never received intervention in terms of reading achievement scores?

### **Definition of Terms**

Response to Intervention frameworks often use the same terms, but the terms may differ slightly by definition and/or implementation in each framework. For the current study, the following terms have been defined.

**Core curriculum** is the general education classroom curriculum every student receives in the classroom. The core curriculum in this study was adopted and implemented district-wide. Students in the intervention received the core curriculum plus supplemental interventions provided by reading specialists.

**Evidence-Based** refers to practices that are supported through empirical evidence that the intervention has evidence supporting its use in improving student achievement.

**Free/Reduced lunch** status is an indicator of family income levels. Students qualifying for free lunch are at 130% of poverty guidelines while students qualifying for reduced lunch are at 185% of poverty guidelines.

**Intensive Intervention**, as defined in this study, is a twenty-five minutes daily reading intervention provided for a minimum of 45 sessions. Intensive intervention refers to a literacy intervention delivered in a one on one or small group setting by a master's level reading specialist focusing on one or more of the five areas of reading.

**Long-term effects** are the effects of the reading intervention found greater than one year after exiting the intervention. For this study, long-term effects will be those found after third grade.

**Nebraska State Assessment-Reading (NeSA-R)** is the annual statewide

reading assessment given to all third through eighth students as well as high school juniors. It is a multiple choice assessment designed to assess students reading skills in a variety of areas including vocabulary and comprehension.

**Response to Intervention** refers to an overall problem-solving framework consisting of a tiered level of supports (Lembke et al., 2010). It consists of core curriculum instruction provided to all students as well as more intense supports and/or interventions for students who meet criteria. For this study, students entered into intervention based upon their benchmarking scores on early literacy and reading probes administered three times per year.

**Short-term effects** refer to those effects found directly after an intervention is over and up to one year after an intervention's end. For this study, short-term effects will be those measured through third grade.

### **Assumptions**

One fundamental assumption made for this study was that students in the study received the same implementation of the core curriculum adopted by the district for kindergarten through fifth grade. The second assumption was that students who were in the intensive reading intervention received equivalent services. Because the interventions were provided by master's level reading specialists and those specialists met on a weekly basis to discuss student progress and intervention work, the components across interventions were similar. However, due to the expertise of the reading specialists, the district framework allowed for professional discretion in determining how to deliver and differentiate the interventions for individual and small group student needs. The third assumption made was that the test scores are roughly

equivalent and they all measure reading ability. The benchmarking probes from AIMSweb would be considered low stakes assessments whereas the SAT10 and NeSA-R are more comprehensive in nature and considered to be high stakes.

### **Limitations of the Study**

The study followed one cohort of students from kindergarten through fifth grade. Only students who attended the school district for all grade levels will be included in the study. A limitation is that one cohort was studied and it is possible that multiple cohorts may have had different results and different experiences in the intervention. Another limitation is that the researcher had no control over the quality of intervention provided, nor a measure of the classroom instruction. In theory, all students received classroom instruction based upon the grade level outcomes and indicators using the same materials. The intervention received by the students should also have been similar in nature as it was research-based and delivered by a master's level reading specialist. However, it was not a scripted program and professional judgment on the part of the reading specialist was part of the intervention program. Finally differences in student achievement may not be related solely to the intervention but rather as a combination of teacher effectiveness, success in the core curriculum and intervention services.

### **Delimitations**

The study is delimited to one school district implementing a specific, district-developed model of intensive reading intervention. The participants in this study are thus only students from this district.

### **Significance of the Study**

The significance of the study lies in the possibility of it adding to the body of research on the long-term impact of early reading intervention. Of the studies researched for this project, the limitation to many was the lack of longitudinal results. The current research project could help strengthen that part of the literature base. The study will examine if a student's cognitive ability (IQ) is a predictor for response to reading intervention services. The relationship between the effects of early intervention and IQ levels continues to be a topic of research and discussion. Finally, as it is an evaluation of a district implemented program, it has practical implications not only for the district in which it was conducted, but also in other districts implementing similar models. The district may use the results to change and improve their current practices or to help inform staffing and budget decisions.

### **Outline of the Study**

Chapter two will review the literature on the components of evidence-based reading interventions, the role of student cognition in response to intervention framework and studies showing short-term effects on student achievement as well as research into the sustainability of the effects of the early intervention. Chapter three reviews the research questions as well as the proposed methodology. It will conclude by discussing the sample, assessments used to measure student reading achievement and the methods for data analysis. Chapter four is a look at the results as they relate to students' reading achievement on both third and fifth grade reading measures. Each research question is examined and results provided. Finally, chapter five provides a summation of the results, the implications of those results and ideas for future

research.

## CHAPTER 2

### Review of the Literature

For the purpose of this study, three areas of research will be examined in depth as they relate directly to the research questions. For comparisons, it is important to examine the components of the reading intervention provided to the students in the study. Second, due to the nature of RtI and special education verification, student achievement and its relationship to cognitive ability is an important construct to consider and investigate, particularly as it relates to long-term academic achievement. Finally, this research is looking to expand upon a previous internal evaluation that focused on the short-term effects of a district reading intervention as well as to provide new insights into sustained, long-term effects on student reading achievement when provided an intensive early reading intervention.

The majority of the studies on early literacy response to intervention models have focused on the effectiveness of student response to prescriptive, commercially-available programs delivered by certified and non-certified staff alike, who have been trained most often by local university programs (Vaughn et al., 2003). Teacher effectiveness has been validated as having the most impact on student achievement and learning (Fuchs & Vaughn, 2012) above and beyond other variables such as class size and socio-economic status. It was with these factors in mind, that the district set out to develop a response to intervention model that would use best practices in literacy instruction paired with the most knowledgeable reading teachers to deliver an intensive reading intervention. In addition to an effective core curriculum, students

not meeting the reading benchmarks would need a supplemental intervention in order to close the achievement gap with peers.

### **Intervention Components**

Effective reading interventions consist of many similar components. Effective interventions provide services to students in small groups, typically no more than 5 students in a group (Coyne et al., 2004), provide direct instruction based up at least one of the five core areas of reading, employ a graduated release of responsibility model, and use progress monitoring to measure individual student progress (Vaughn, Denton & Fletcher, 2010). Differences within interventions include providing staff development and/or coaching for classroom teachers (Scanlon et al., 2008), the use of standard protocol interventions (Bursuck & Damer, 2007), providing one on one tutoring (Hurry & Sylva, 2007), and the use of university trained graduate students to deliver the interventions.

The amount of time per intervention session varies, ranging from 45-165 additional minutes per week over and above what students receive from core classroom instruction (Bursuck & Blanks, 2010; Vaughn et al., 2010; Vaughn et al., 2003). In a study of first grade students, Wanzek and Vaughn (2008) found that a double dose of intervention time (60 minutes/day) did not yield significantly fewer non-responders than the group receiving a single dose of intervention time (30 minutes/day). Additionally, positive intervention effects have been found for students receiving as little as 60 minutes per week of supplemental intervention (Scanlon et al., 2008). Based upon this review, for younger students more time spent in an intervention does not necessarily yield a corresponding increase in results. However,

students with an intense need for reading services would most likely need more than two times a week intervention (Bursuck & Blanks, 2010) and as students move out of the primary grades, the amount of time spent in intervention may need to increase to see desired gains (Vaughn & Fletcher, 2012).

Debate continues over the length of time an intervention should last for maximum effect, but an early study by Vaughn et al., (2003) found that intervention effectiveness appeared to reach its peak at around 20 weeks for students who deemed to be typical responders but that some students even after 30 plus weeks of intervention never met criteria to exit. Recent studies have indicated that some students (those who are slower responders) may need more time to respond to an intervention and that an extended intervention time period may be what is needed to remediate the reading deficits (Vaughn et al., 2010). Studies examined for this research ranged in providing intervention for an entire school year (Scanlon, et al., 2008) to providing a targeted intervention for a seven weeks (Klubnik & Ardoin, 2010). The results from the research indicate that duration of an intervention needs to be driven more by a student's progress and rate of improvement than an arbitrary cut point.

Intervention group size has been studied as one of the variables that could impact the effectiveness of a supplemental reading intervention. Too large a group diminishes effectiveness by not providing enough response opportunities per student while working one on one with a student may not be efficient enough in exchange for the amount of resources it takes to provide (Bursuck & Blanks, 2010). Vaughn, Linan-Thompson, Kouzekanani, et al. (2003) examined the effects of three different

group sizes and intervention effectiveness. Researchers looked at reading intervention effectiveness for at-risk second grade readers across three treatment conditions- 1:1 (teacher and student), 1:3 (teacher and three students) and 1:10 (teacher and ten students). All other intervention components, aside from group size, were consistent and implemented with fidelity. All of the groups demonstrated growth at the end intervention and maintained those gains several weeks later. For student gains, group size mattered only when comparing the 1:10 group with the 1:1 pairing. There were no significant differences found between the 1:1 group and the 1:3 group; indicating that effective reading interventions for primary students can be delivered in a small group setting.

Building on the work by Vaughn, Linan-Thompson, Kouzekanani, et al (2003), Klubnik and Ardoin (2010) compared the gains in reading fluency using a repeated reading intervention. First grade students received the intervention either individually or in a small group for seven weeks. Consistent with previous findings, students' reading fluency scores' improvement was comparable across groups. When compared, the results indicated that individual instruction is not necessary for most students with reading deficits to improve in their skills.

Earlier, Elbaum, Vaughn, Hughes, and Moody (2000) conducted a meta-analysis comparing small group instruction with one-on-one interventions across 29 studies. They found that there was no advantage to the one-on-one interventions as students receiving the intervention in small groups made comparable gains. Therefore, while students who fail to make adequate progress in a small group intervention may need 1:1 attention and instruction, most primary students will

respond to supplemental reading interventions provided in a small group setting (Bursuck & Blanks, 2010; Elbaum et al., 2000; Vaughn et al., 2010). It should be noted that students who fail to make adequate progress in Tier 2 and move to a Tier 3 intervention may need an individualized intervention (Bursuck & Blanks, 2010).

Perhaps the most important component of the reading interventions was the delivery of reading instruction based on the Big 5 areas of reading. Each of the studies examined focused on one or more of the areas of reading and each intervention showed effects. The district intervention model was delivered daily, in small groups over a lengthy amount of time and was supplemental to the core curriculum. Direct instruction was provided using all of the five areas of reading with emphasis given to the areas a student was struggling with the most. Students received an intervention that either falls in line with or exceeds the minimum standards set forth by the research examined.

To summarize, research on the components of an effective reading intervention vary in terms of logistics (group size, time spent in intervention, duration of the intervention and how the intervention is delivered). The research is clear on group size as students in small group intervention have comparable gains with those students in individual interventions but that those groups should consist of no more than 3-5 students (Bursuck & Blanks, 2010; Vaughn, et al., 2010). More research needs to be completed on the length of duration (number of weeks) an intervention should last. Earlier research suggested fewer weeks was necessary while more recent research calls for extended amounts of time in an intervention if a student is progressing. Since the students in the proposed study will have had the opportunity to

participate in six semester-long sessions spread over three years, they were part of an extended intervention duration. A synthesis examining the effects of extensive interventions (those offering 100 or more sessions) found that “Overall, students with reading difficulties or disabilities who were provided extended interventions benefited, with several studies reporting outcomes within the average range” (Vaughn, et al., 2010, p. 437). Finally, all of the intervention reviewed for this study found significant effects on student reading scores indicating that multiple interventions were successful in remediating early reading skills. It could be that as long as the intervention focuses strongly on one or more of the Big 5 areas of reading and uses effective instructional strategies students will show at least some progress.

### **Intelligence**

A core tenet of Response to Intervention framework is that much less attention and/or consideration is given to a student’s cognitive ability, particularly as measured by traditional IQ tests. Articles written on the construct of Response to Intervention in relation to students’ intelligence quotients (IQs) state that while cognitive variables may play a role in a student’s acquisition of reading skills, IQ by itself “did not differentiate among at-risk and typical readers, nor did IQ differentiate between students who did and did not respond to intensive tutoring” (Lembke et al., 2010, p. 25). Cognitive variables, including IQ scores remain difficult to control yet must be considered in program effectiveness. Individual studies have indicated that cognitive levels and/or IQ scores are not strong predictors of individual students’ responses to intervention (Gresham & Vellutino, 2010). In a study examining the long-term stability of learning disability classification, Francis et al. (2005), found

that neither the IQ-discrepancy model nor low achievement scores alone were sufficient in defining students as having a learning disability.

Better predictors of academic achievement are direct measures of what the student needs to be learning. Yet, cognitive functioning levels of students continue to be a topic of discussion as students are considered for placement into special education. Fletcher et al. (2011) further examined the cognitive attributes that may be associated with differences between groups of students. They used multiple cognitive measures to examine difference between students who were deemed inadequate responders to intervention, adequate responders to intervention and students who needed no intervention. The results indicated that while significant cognitive differences existed on some measures, the cognitive differences themselves would not have been enough to appropriately classify the students. Fletcher, et al. (2011) stated, “The results indicate that a classification of LD incorporating inadequate response yields subgroups that can be differentiated on cognitive variables used to create the subgroups. However, no single method would detect the pool of all inadequate responders” (p. 18). Worth noting is that the previous study was limited to a short-term intervention and looked only at students in receiving Tier 2 services, not those in Tier 3 whose reading impairment is typically more severe.

In summary, IQ scores tend to be a poor predictor of later student reading achievement and are ineffective in separating students likely to respond to early reading intervention. However, teachers and the school community continue to see IQ as an important construct and something with which to measure expectations and tailor instruction. It is necessary to examine for this study as the district the needs the

full picture as it relates both to long-term effects and special education verification and special education services.

**Short-term and Long-term Effects of Early Reading Interventions.** The effects of early reading intervention past the short-term are questionable and under researched. Much of the research has focused on skill remediation and achievement effects in the short-term (typically within one year's time). The question remains as to whether success in an early reading intervention produces and predicts future reading success and achievement. In theory, students who exit from intervention should become more like the typical learners in the classroom. However, students don't exit at the same achievement levels as their peers, which suggest that at some point, they may require additional support and services. A question to be answered is "Does an early intervention program successfully inoculate students against later reading failure?" For a school district that placed the majority of its reading resources into the k-2 program, the long-term effects need to be examined in addition to the short-term outcomes for students.

Several reading intervention models demonstrated positive outcomes for students in the short-term (Coyne, Kame'enui, Simmons & Harn, 2004; Hurry & Sylva, 2007; Klubnik & Ardoin, 2010; Scanlon et al., 2008; Vaughn et al., 2003). The models ranged from Reading Recovery intervention (Hurry & Sylva, 2007), repeated reading for fluency (Klubnik & Ardoin, 2010), a program delivered by tutors after extensive training (Vaughn et al., 2003) and a model combining professional development and supplemental intervention (Scanlon et al., 2008). Each of these intervention models had results showing student improvement with reading skills in

the short-term. Effects were considered to be short-term if measured directly after the intervention ended and up to one year later.

Scanlon et al. (2008) followed students from the beginning of kindergarten to the beginning of first grade. The implementation cohort of students receiving a supplemental Tier 2 intervention (2 days a week for 30 minutes) showed significant gains by the beginning of first grade. The percentage of students identified as at-risk for early reading difficulties went from 52.4 to 31.5 indicating that a modest intervention was effective in bringing about student growth and change. However, these students were not followed beyond first grade, so there is no way of knowing if students maintained the growth made during the intervention.

An intervention model, on which the district's intervention model was loosely based, provided small group reading intervention to second grade students based on the five essential areas of early reading (Vaughn et al., 2003). In this study, students exited the intervention services after every 10 weeks of intervention services based on test score criteria. Some students received only 10 weeks of instruction and exited, others had 20 weeks on intervention and exited while some students had 30 weeks of intervention services and never met exit criteria. Most of the students who exited at the 10 and 20-week intervals continued to make gains in their classrooms and no longer needed supplemental intervention services. A few students did not make adequate gains when leaving the intervention and those students remained behind when assessed again in third grade. One limitation pointed out by researchers was the lack of long-term follow-up but they stated that, "if relatively small doses of

supplemental instruction (25 hr to 30 hr) yield overall positive outcomes initially and in the long term, then benefits are quite substantial” (Vaughn et al., 2003, p. 407).

A second intervention model similar to that of the district model was examined for longitudinal outcomes. The model examined was Reading Recovery an intense reading intervention for first grade students identified as at-risk for reading failure. Reading Recovery provides daily reading instruction in a one on one situation to students in need. And in the short-term, much like the district model, Reading Recovery intervention had significant effects on students’ reading achievement producing effect sizes ranging from .63-.87 (Hurry & Silva, 2007). When assessed again three and a half years later, the effect size had dropped to .15 and was not significant. The researchers concluded that the Reading Recovery intervention did not produce long-term effects on students reading and spelling achievement leading the researchers to write, “Sadly, early intervention of either a broad or phonics-based nature, even though effective at the time of delivery does not appear to inoculate children from later problems” (p. 244). The one caveat to this study was that the overall school scores were below the national average, not just the students who had participated in Reading Recovery (Hurry & Silva, 2007). Thus the core curriculum may not have been adequate enough to support the instructional needs of the learners in the buildings.

Coyne et al. (2004) researched a strong, kindergarten intervention program in which students meeting criteria received a 7-month reading intervention. They followed the students through the middle of first grade and determined that an early reading intervention provided in kindergarten can prevent reading difficulties into the

middle of first grade. The intervention components of this study mirrored those found in the district intervention as students received 30 minutes of intervention per day in groups of three to five students over an extended period of time. And the results of study are much like what was found in the district internal evaluation providing evidence both for the model and for providing early reading intervention beginning in kindergarten. One limitation to the study was that only the students with the strongest response to the intervention were included in the first grade follow-up while the district study will include all students receiving the intervention.

To summarize, multiple studies support the use of early reading interventions to remediate early reading deficits. Models of intervention vary but almost all showed short-term effects for the majority of students who participated in them. The focus on one or more of the five essential areas of reading (phonemic awareness, phonics, vocabulary, fluency and reading comprehension) was a part of every intervention producing significant results. Of importance is that the model of intervention being researched for this dissertation contains the same components, strategies and structures of the previous studies. The district model produced short-term effects but like many of the other studies needs to be studied for long-term effects on student reading achievement.

### **Summary**

The literature strongly shows the link between early intervention and short-term effects on remediating students' reading skills. Multiple studies found evidence for providing intense reading supports in the early elementary grades. Less clear and with fewer studies are the long-term effects of early reading interventions. Of the

studies examined, most did not show long-term effects after the intervention ended, as there was no longitudinal follow-up for the studies. However, the research in this field continues to grow as students move into the later elementary and secondary grades. Finally, the area of cognitive ability continues to be an issue worth exploring and considering when developing and implementing a Response to Intervention model.

## CHAPTER THREE

### Methodology

The purpose of this study was to examine the effects of a district developed and implemented early reading intervention that used a Response to Intervention framework. Questions addressed both the short-term and long-term effects of the intervention on student reading levels as well as the importance or lack thereof of a student's cognitive levels and the response level to the reading intervention services provided.

Simmons et al. (2000) described an effective school-wide model of reading designed to reach students and maximize reading achievement no matter what tier a student was in. They described a model as a framework centered around an effective core curriculum followed by delivering interventions to those students at-risk of reading failure. In addition, the framework called for ongoing use of data to screen, identify and progress monitor students' reading achievement regularly.

Shapiro and Clemens (2009) set forth a proposed evaluation model for schools and school district to use in evaluating the success of RtI in their settings. They recommend addressing five indicators (1) Risk level across benchmark periods, (2) Rate of Improvement (ROI) Across Tiers, (3) Movement between Tiers, (4) Movement within Tiers, and (5) Accuracy of Special Education Decisions (p. 5). The current research study was concerned mainly with the rate of improvement and movement within tiers.

### Study Design

A longitudinal, single cohort, quasi-experimental design was used. One cohort was followed from kindergarten through the fifth grade retrospectively. The assessments had been administered previously and the data collected by the school district as part of the district's assessment process. The sample of students was a function of the intervention aspect of the research project. Participants were students meeting the criteria for the research questions (students who have attended the school district from kindergarten through fifth grade). Students were not randomly assigned to an experimental condition, but rather had been previously entered into intervention based upon district-wide criteria. Also, students were not randomly exited from the reading intervention but would have met specific, district criteria.

### **Research Questions**

1. What were the effects (short and long term) on reading achievement for the students who received intensive reading intervention based on their third and fifth grade reading scores?
2. Were the reading achievement gains made in the intervention program sustained after students exit, and if so, how long are those gains maintained?
3. Did the students who exited from reading intervention continue to differ significantly from those who never received intervention in terms of reading achievement scores?

### **Participants**

The school district, in which this evaluative research was conducted, is a K-12 district with an enrollment of approximately 6,000 students. It has multiple elementary schools with enrollments ranging from 180 to 370 students. There is great

diversity in the socio-economic composition in ten elementary schools with the percentage of students qualifying for free or reduced price lunch ranging from less than 10% to approximately 60% of the total student population. The cohort studied consisted of students who were third grade students during the 2009-2010 school year and fifth grade students in 2011-2012. Students were enrolled in one of district's elementary buildings some of which are classified as Title I schools. All students in the sample would have been in the school district for grades kindergarten through third grade (no move ins or students who moved before they took the third grade SAT 10 were included in the analysis). The cohort consisted of males and females. In addition to students who received the core curriculum only, the cohort included students who received supplemental Response to Intervention services as well as students identified for special education. Demographic information was collected in order to better describe the research sample.

The participants in this study consisted of 400 students with 143 (35%) of the cohort having received intensive reading intervention services at some point before third grade. Of those receiving intervention services, 27% received one 45-day session, 29% received two sessions, 20% received three sessions and the remaining 23% received four or more sessions of intensive reading intervention services. The ethnicity breakdown of the cohort studied was as follows: 83% White, 8% African-American, 6% Hispanic, and 3% Asian. The cohort had a free/reduced lunch percentage of 30% and five percent of the students were classified as English Language Learners. By the end of fifth grade, fourteen percent of the cohort studied were verified as receiving special education services across all disability categories.

## **Measures/Instruments**

The following measures were selected, as they are already part of the district's annual assessment framework, are valid measures of what needs to be measured and they provide standardized scores. Reading skills were assessed using two different assessments, one is a national normed assessment selected by the district and the other being the state assessment for reading given to all students. Nationally normed assessments such as the Stanford Achievement Test have been used as outcome measures in other reading research studies. The Nebraska State Assessment was selected, as it is a high stakes measure for the students attending the district in the study. Finally, the Otis-Lennon School Ability Test was chosen as it is already given by the district in conjunction with the Stanford Achievement Test and yields both verbal and nonverbal intelligence scores as well as an overall School Ability Inventory (SAI) score.

Stanford Achievement Test- Tenth Edition (SAT10): This nationally normed assessment is given to district third and fifth grade students in the fall. The SAT10 measures academic achievement in multiple areas including reading, math, language, science, social science, listening and thinking. The alpha reliability for the SAT10 reading decision is .87 (Harcourt Educational Measurement, 2003).

Otis-Lennon School Ability Test-Eighth Edition (OLSAT): This test measures a student's aptitude/ability for learning. It is a 40-minute, group-administered assessment that measures student's verbal and nonverbal reasoning skills. The OLSAT can be classified as an IQ test and is given in conjunction with the SAT10 for the purpose of comparing student aptitude to student achievement/performance. The

School Ability Inventory (SAI) is provided by individual student and is a standard score with a mean of 100 (Otis & Lennon, 1997).

Nebraska State Assessment-Reading (NeSA-R): The NeSA-R is the statewide reading assessment given annually to students in grades 3-8 and 11. It is a multiple choice assessment yielding scaled scores that can be compared across years. The decision consistency scores for this assessment range from .86-.90 while decision accuracy scores range from .90-.93 (NDE, 2012). Decision consistency and decision accuracy are analogous to test reliability scores. The NeSA-R is significantly correlated with the SAT 10 ( $r=.788, p < .01$ ) (NDE, 2012). For this study, the students' scaled scores from third and fifth grade will be analyzed.

### **Procedures**

Given that this proposed study is a retroactive, quasi-experimental design, no new data were collected. Assessment and demographic data was requested and obtained from the school district. It was data that was previously collected and used for both district and state reporting purposes. The data requested included measures from the students' third and fifth grade years.

From third grade assessments, the requested data was the SAT10, OLSAT and NeSA-R scores. From fifth grade, the requested scores were the SAT10 and OLSAT scores in addition to the Nebraska State Assessment for reading (NeSA-R). Student intervention history including initial entry into the intervention program, whether the student met exit criteria, how many total sessions of intensive intervention the student had and how many of those sessions were consecutive will be used. Demographic information on each student was obtained (gender, ethnicity, free/reduced lunch

status, English Language Learner, and special education status) in an attempt to disaggregate student scores and results by those categories.

### **Analysis**

Descriptive statistics were calculated across all measures and demographic information. Effect sizes were calculated for long-term and short-term effects. Short-term effects were calculated using third grade scores while long-term effects were calculated using the fifth grade SAT 10 and NeSA-R scores. Frequencies are reported for the number of students served by the RtI reading framework, the number of students who exited the program and the number of student who entered into special education.

## CHAPTER 4

## RESULTS

**Question #1: What were the effects (short and long term) on reading achievement for the students who received intensive reading intervention based on their third and fifth grade reading scores?** Of the students who received intervention ( $n = 143$ ), 62% ( $n = 88$ ) met exit criteria by the end of second grade meaning that they had scored at or above the 25<sup>th</sup> percentile on multiple reading measures. The remaining 55 students had not met exit criteria by the end of second grade.

As Table 1 illustrates, the short-term effects for students exiting intervention were quite positive with 73% at least maintaining their growth and scoring above the 25<sup>th</sup> percentile on the SAT 10 Total Reading Battery with the mean NCE ( $M = 45$ ) for the group being within the average range. That same group of exiting students had a mean score ( $M = 91.24$ ) above the target set for the Nebraska State Assessment-Reading (Target Scale Score = 85) with 65% of the students being proficient.

The long-term effects of the intervention were that the students who exited the intervention not only sustained their growth during the intervention, but exceeded target scores for the most part. On the fifth grade SAT 10 Total Reading Battery, 92% were at or above the 25<sup>th</sup> percentile an increase of 19% from third grade and the mean score for the group was at the 57<sup>th</sup> percentile a gain of nine NCE points. The majority of students went from being below average in the primary grades to being solidly within the average range by fifth grade. By the end of fifth grade,

85% of the exit group scored at/above the proficient range on the NeSA-Reading assessment with the

Table 1

*Scores on Third and Fifth Grade Reading Assessments for Students who Received Intensive Reading Intervention*

	Students Exiting Intervention	Students Not Exiting Intervention
3 <sup>rd</sup> Grade	<i>n</i> = 88	<i>n</i> = 55
SAT10		
Mean NCE	45	31
Percentile Rank	40 <sup>th</sup>	18 <sup>th</sup>
Percent above Target	73%	35%
NeSA-R		
Mean Scale Score	91.24	77.51
Percent Proficient	65%	38%
OLSAT		
Mean NCE	45	35
5 <sup>th</sup> Grade	<i>n</i> = 78	<i>n</i> = 44
SAT 10		
Mean NCE	54	40
Percentile Rank	57 <sup>th</sup>	31 <sup>st</sup>
Percent Above Target	92%	64%
NeSA-R		
Mean Scale Score	117.40	82.91
Percent Proficient	85%	42%
OLSAT		
Mean NCE	55	43

mean score ( $M = 117.40$ ) showing an increase of twenty-six scale score points from the third grade mean score ( $M = 91.24$ ).

As would be expected, the non-exit group of students did not show the same levels of improvement. However, a similar pattern of gains on the SAT10 Total Reading Battery from third to fifth grade was evident with this group of students as well. While only 35% scored above the target score on the SAT 10 Total Reading Battery in third grade that percentage increased to 64% by fifth grade with the mean score rising by nine NCE points. In third grade, the average score on the SAT10 Total Reading Battery was at the 18<sup>th</sup> percentile but by fifth grade the average score had increased to being at the 31<sup>st</sup> percentile. The pattern of gains on the NeSA-R were similar but smaller in scope as the mean score increased by only 5.4 scale score points from third to fifth grade and the majority of the students continued to score in the non-proficient range.

Students in both groups (exit and non-exit) benefited from participating in the reading intervention program. Considering students in both groups had scored below the 16<sup>th</sup> percentile on multiple K-2 reading assessments and were considered to be at-risk readers, the gains made by both groups were impressive. Perhaps surprising is the continued gains made by the students in the non-exit group. While the non-exit group of students continued to be in the low average range on the SAT10, they continued to improve and gain ground as opposed to simply maintaining their status.

**Question #2: Were reading achievement gains made in the intervention program sustained after students exit and if so, how long were those gains**

**maintained?**

Paired samples *t*-tests were conducted to analyze student growth from third to fifth grade on students who exited the intensive reading intervention. Effect sizes using Cohen's *d* were then calculated to determine the size of the change for any significant findings. Students who exited intervention made significant gains on the SAT10 Total Reading Battery from third to fifth grade  $t(77)=-6.57, p<.01, d=.74$ . Significant gains were also found on the NeSA-R scores from third to fifth grade,  $t(77)=-6.98, p<.01, d=.78$ . The results from the *t*-tests indicate that not only were the gains made in the reading intervention sustained, but as whole, the group continued to improve in terms of reading achievement a full two years after the intervention ended.

The large effect sizes indicate that improvement continued to be made by students exiting the intervention for at least two plus years after exiting the intervention. The mean fifth grade scores on both the SAT10 Total Reading Battery and the NeSA-Reading assessment were solidly in the average range and on-grade level. By the end of fifth grade, most of the students (85%) scored in the proficient range on the annual state assessment. The fifth grade scores and the students' continued growth demonstrate that they were able to access and learn from the core curriculum the necessary reading skills and strategies.

**Question #3: Did the students who exited from reading intervention continue to differ significantly from those who never received intervention in terms of reading achievement scores?**

Independent samples *t*-tests were run to compare the results of the students who

never received intensive reading intervention services with those students who received services and exited by the end of second grade. The third grade scores from the SAT10 Total Reading and the NeSA-Reading revealed significant differences between students never participating in intensive reading intervention and those who participated in and exited the program. Both t-tests found that the no intervention group scored significantly higher on the SAT10 ( $t(340)=-6.612$ ,  $p<.01$ ) and on the NeSA-Reading ( $t(333)=-6.818$ ,  $p<.01$ ). The same pattern of results was found when examining the 5<sup>th</sup> grade scores. Students in the no intervention group continued to score significant higher on both the SAT 10 Total Reading,  $t(296)=-7.393$ ,  $p<.01$ , and on the NeSA-Reading,  $t(303)=-7.439$ ,  $p<.01$ . While the students who exited intervention improved significantly during and after intervention and sustained that progress, students never needing intervention continued to score significantly higher than students exiting intervention.

Although a significant difference remains between the two groups, both groups have demonstrated that learning in the general education classroom has maintained gains for continued reading achievement. In the case of the exiting students, the gains demonstrated are surprising as they outperformed their third grade results, which were the closest to the end of the intervention services. Since both groups of students maintained acceptable rates or growth, the difference between the groups may not matter as much in the classroom as instruction at grade level with appropriate differentiation strategies will continue to meet the needs of both groups of students.



## CHAPTER 5

### DISCUSSION

One of the biggest questions needing to be answered in both the existing literature base and for this study was the question of long-term impact. Short-term impact of reading intervention has substantial support in the literature while longitudinal studies are scarce. The results from this study found significant long-term effects for students who received intensive reading intervention. The intensive reading intervention provided to students who qualified in kindergarten through second grade was successful in remediating reading skills for many students by third grade and an even larger percentage by fifth grade. Students who exited the intervention successfully were likely to be on grade level by the end of fifth grade, but remained behind their peers who never needed reading intervention.

While students who exited the intervention ended at a higher level of reading achievement, even the students who did not exit the intervention showed sustained growth and maintenance in their reading skills. Failure to exit the program did not equate to lack of growth as they progressed through school nor did it point to a failure of the intervention. It is possible that the intervention made a difference for those students who failed to exit as evidenced by their later reading achievement. This finding may be of particular interest to the district providing the intervention as it shows the utility of providing early intervention and how it relates to later reading achievement for all students receiving the intervention.

The longitudinal findings in this study were nearly opposite of what was found by Hurry and Silva (2007) when they examined the long-term effects of Reading Recovery intervention as they found very little impact when they assessed students three years later. The current study found that students not only sustained progress made in the intervention but continued to make significant growth over 3 years later. One issue of note may be that the overall quality of the core curriculum may have been higher for this study than what Hurry and Silva (2007) found indicating the importance of an effective Tier I in sustaining student growth.

The short-term results from this study mirror much of the previous research completed on early reading interventions (Coyne, Kame'enui, Simmons & Harn, 2004; Hurry & Sylva, 2007; Klubnik & Ardoin, 2010; Scanlon et al., 2008; Vaughn et al., 2003). As in previous studies, students showed marked growth in their reading skills when they received intensive reading support. Early reading intervention continues to be supported by the current and previous results especially when 73% of the students who met exit criteria received two or fewer 45-day sessions of intervention.

The positive results support the tenets of reading intervention such as focusing on the five areas of reading (phonics, phonemic awareness, fluency, vocabulary and comprehension), the use of small groups to deliver intervention, and the intensity needed to produce significant results. More research needs to be done on the amount of time spent in intervention as the results indicate a bit of a mixed result. The time in intervention may not be fully explained as the delayed effects

on student achievement may fall in line with other recent research in the area of students with significant reading difficulties or disabilities (Wanzek & Vaughn, 2007).

### **Future research**

In the area of future research, recommendations include a larger study, following more cohorts and investigating particular intervention strategies. The current study size was not large enough to fully investigate the impact of other factors on the success of the intensive reading intervention. Further investigation into the factors such as ethnicity, free/reduced lunch status and English Language Learner status could yield more information about for whom the intensive reading intervention works best and to examine any significant differences in the populations served.

From Table 2, the demographic breakdown of the three groups looks to be slightly different when examining the free/reduced lunch rates as the percentage of students qualifying for free lunch in the non-exit group was 50% compared with only 31% of those in the exiting group. However, the sample sizes were not adequate to make definitive comparisons. Rather it is a potential difference that may be a point to consider for future studies.

Beyond student demographics, other areas to explore would be the specifics of the intervention. Using multiple cohorts, the intervention could be evaluated further by examining the reading results of students by the number of intervention sessions as well as by the results of their OLSAT scores. The IQ relationship with intervention effectiveness was not fully explored in the current study, but could be

explored especially when looking at the long-term outcomes.

Another area for future research would be to conduct a multiple cohort longitudinal study. By studying multiple cohorts, one could examine the patterns of long-term impact on overall student achievement within a district. It would be interesting to see if the pattern of results was similar across cohorts and different subgroups of students.

Table 2

*Student Demographics*

	No Intervention Services (n=257)	Exited Intervention (n=78)	Did not Exit Intervention (n=44)
Lunch Status			
Free	12%	31%	50%
Reduced	9%	**	**
Special Education	9%	9%	46%
English Language Learner	**	**	**
Female	52%	44%	47%
White	87%	80%	73%
African-American	6%	12%	**
Hispanic	**	**	**
Asian	4%	**	**

\*\*Groups had fewer than ten students and could not be reported

Multiple cohorts would allow for a thorough evaluation of the effect on special education identification rates across disabilities, but specifically in the areas of learning disabilities. Did the intervention effectively reduce the rate of students verified for special education in the area of reading disabilities?

This particular intervention likely affected more than the students in the intervention, as teachers may have been able to accelerate all students' learning when the majority of students entered the intermediate grades on grade level. When less time is needed for remediation of reading skills, more time can be spent on pushing students beyond reading basics and into more advanced comprehension and vocabulary acquisition. An overall analysis of test scores in relation to the academic growth of students who received intervention may yield interesting findings on how meeting the needs early of at-risk students affects all students as they progress through school.

A final area of future research may be to examine the program more in depth as to what strategies were used that produced the most impact. This study did not look at the specific strategies nor was a specific, commercially available program followed. Given the significant effects of the intervention, more attention and research to the intervention components and strategies may be helpful for the current district involved in this study as well as other districts who may want to implement a similar model of intervention. Breaking down how much time was spent on each focus area of reading while in the intervention could help inform development of future interventions or it could lead to better understanding of the role a Master's level reading specialist has on student achievement. Perhaps

receiving services from an expert in reading is more effective, particularly long-term, than students who receive intervention from whomever is convenient in a building or from a prescriptive program. The instructional skills and levels of understanding about early literacy were not studied but may be of importance as the reading specialists made decisions daily about how and what to teach the students in their groups.

From a district standpoint, the continued growth of the students after two plus years out of the intervention lends credence to the intervention program and helps justify the decision to provide the most intensive services for primary students. Students who received intensive early intervention were likely to end up on grade level by the end of fifth grade according to the Nebraska State Assessment-Reading (NeSA-R) as 85% of the students who received and exited intensive intervention scored in the proficient range. These results are impressive considering the average rate of proficiency for the state of Nebraska across all fifth grade students in 2011-12 was 76%. Therefore, the resources put into providing an intensive early reading intervention may be warranted given the rate of return by fifth grade.

Overall, intensive reading intervention provided by district personnel resulted in significant short-term and more importantly, long-term gains in reading. The changes in reading achievement were not the result of a scripted program as in other research studies but rather intense intervention that was provided by reading professionals along with effective core curriculum instruction. The results support the need for intensive early intervention as well as many of other core

components comprising the Response to Intervention framework. Knowing that students whose reading skills are not remediated by late elementary face a tough academic road (Vaughn, et al, 2010), implementing and sustaining an effective early literacy intervention may be the most promising effort in increasing the probability of overall student achievement and school success.

## References

- Bursuck, B., & Blanks, B. (2010). Evidence-based early reading practices within a response to intervention system. *Psychology in the Schools, 47*(5), 421-431. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2010-08036-002&site=ehost-live>
- Coyne, M. D., Kame'enui, E. J., Simmons, D. C., & Harn, B. A. (2004). Beginning reading intervention as inoculation or insulin: First-grade reading performance of strong responders to kindergarten intervention. *Journal of Learning Disabilities, 37*(2), 90-104. doi:10.1177/00222194040370020101
- Elbaum, B., Vaughn, S., Tejero Hughes, M., & Watson Moody, S. (2000). How effective are one-to-one tutoring programs in reading for elementary students at risk for reading failure? A meta-analysis of the intervention research. *Journal of Educational Psychology, 92*(4), 605-619. doi:10.1037/0022-0663.92.4.605
- Fletcher, J. M., Stuebing, K. K., Barth, A. E., Denton, C. A., Cirino, P. T., Francis, D. J., & Vaughn, S. (2011). Cognitive correlates of inadequate response to reading intervention. *School Psychology Review, 40*(1), 3-22. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2011-07091-001&site=ehost-live>
- Fuchs, D., Compton, D. L., Fuchs, L. S., Bryant, J., & Davis, G. N. (2008). Making 'secondary intervention' work in a three-tier responsiveness-to-intervention

model: Findings from the first-grade longitudinal reading study of the national research center on learning disabilities. *Reading and Writing*, 21(4), 413-436.  
doi:10.1007/s11145-007-9083-9

Fuchs, D., Fuchs, L.S., & Compton, D. L. (2012). Smart RTI: A next-generation approach to multilevel prevention. *Exceptional Children*, 78 (3), 263-279.

Fuchs, L.S., & Vaughn, S. (2012). Responsiveness-to-Intervention: A decade later. *Journal of Learning Disabilities*, 45(3), 195-203. doi: 10.1177/0022219412442150

Gresham, F. M., & Vellutino, F. R. (2010). What is the role of intelligence in the identification of specific learning disabilities? issues and clarifications. *Learning Disabilities Research & Practice*, 25(4), 194-206. doi:10.1111/j.1540-5826.2010.00317.x

Harcourt Educational Measurement. (2003). *Stanford Achievement Test* (10<sup>th</sup> ed.). San Antonio, TX: Harcourt Assessment.

Hurry, J., & Sylva, K. (2007). Long-term outcomes of early reading intervention. *Journal of Research in Reading*, 30(7), 227-248. doi: 10.1111/j.1467-9817.2007.00338.x

Klubnik, C., & Ardoin, S. P. (2010). Examining immediate and maintenance effects of a reading intervention package on generalization materials: Individual verses group implementation. *Journal of Behavioral Education*, 19(1), 7-29. doi:10.1007/s10864-009-9096-3

Lembke, E. S., Garman, C., Deno, S. L., & Stecker, P. M. (2010). One elementary school's implementation of response to intervention (RTI). *Reading & Writing Quarterly: Overcoming Learning Difficulties*, 26(4), 361-373.

doi:10.1080/10573569.2010.500266

Lembke, E. S., McMaster, K. L., & Stecker, P. M. (2010). The prevention science of reading research within a response-to-interpretation model. *Psychology in the Schools*, 47(1), 22-35. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2010-00058-003&site=ehost-live>

National Association of State Directors of Special Education (NASDSE). (2005). Response to Intervention: Blueprint for Implementation.

National Early Literacy Panel (NELP). (2008). Developing early literacy: Report of the national early literacy panel. Washington, DC: National Institute for Literacy.

National Reading Panel (NRP). (2000). Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction. Washington, DC: National Institute of Child Health and Human Development.

Nebraska Department of Education. (2012). Nebraska State Accountability Technical Report. prepared by DRC. [www.education.ne.gov/.../Final%20NeSA%202012%20Technical%20Report%20for%20NDE....](http://www.education.ne.gov/.../Final%20NeSA%202012%20Technical%20Report%20for%20NDE....)

- Otis, A.S., & Lennon, R. T. (1997). *Otis-Lennon School Ability Test (OLSAT) technical manual*. San Antonio, TX: Harcourt Brace Educational Measurement.
- Scanlon, D. M., Gelzheiser, L. M., Vellutino, F. R., Schatschneider, C., & Sweeney, J. M. (2008). Reducing the incidence of early reading difficulties: Professional development for classroom teachers versus direct interventions for children. *Learning and Individual Differences, 18*(3), 346-359.  
doi:10.1016/j.lindif.2008.05.002
- Shapiro, E. S., & Clemens, N. H. (2009). A conceptual model for evaluating system effects of response to intervention. *Assessment for Effective Intervention, 35*(1), 3-16.  
doi:10.1177/1534508408330080
- Simmons, D. C., Kame'enui, E. J., Good III, R. H., Harn, B.A., Cole, C. & Braun, D. (2000). Building, implementing & sustaining a beginning reading model. OSSC Bulletin Oregon School Study Council, 43 (3), 8-29.
- Vaughn, S., Denton, C. A., & Fletcher, J. M. (2010). Why intensive interventions are necessary for students with severe reading difficulties. *Psychology in the Schools, 47*(5), 432-444. Retrieved from  
<http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2010-08036-003&site=ehost-live>
- Vaughn, S., & Fletcher, J. (2012). Response to intervention with secondary school students with reading difficulties. *Journal of Learning Disabilities, 45*(3), 244-256.  
doi:10.1177/0022219412442157

- Vaughn, S., Linan-Thompson, S., & Hickman, P. (2003). Response to instruction as a means of identifying students with reading/learning disabilities. *Exceptional Children*, 69(4), 391-409.
- Vaughn, S., Linan-Thompson, S., Kouzekanani, K., Bryant, D. P., Dickson, S., & Blozis, S.A. (2003). Reading instruction grouping for students with reading difficulties. *Remedial and Special Education*, 24(5), 301-315.  
doi:10.1177/07419325030240050501
- Vaughn, S., Wanzek, J., Wexler, J., Barth, A., Cirino, P. T., Fletcher, J., . . . Francis, D. (2010). The relative effects of group size on reading progress of older students with reading difficulties. *Reading and Writing*, 23(8), 931-956. doi:10.1007/s11145-09-9183-9
- Wanzek, J., Vaughn, S. (2007). Research-based implications from extensive early reading interventions. *School Psychology Review*, 36(4), 541-561. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2008-00698-003&site=ehost-live>
- Wanzek, J., & Vaughn, S. (2008). Response to varying amounts of time in reading intervention for students with low response to intervention. *Journal of Learning Disabilities*, 41(2), 126-142. doi:10.1177/0022219407313426