EFFECTS OF READING INTERVENTION STRATEGIES FOR ELEMENTARY STUDENTS
AT-RISK OF READING DISABILITIES
by
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**Abstract**

Reading is an essential skill in life and reading intervention can be fundamental for many students to find success and be better able to achieve in academics. Studied was k-3 student reading progress through intervention, reading intervention strategies, and which strategies are effective for all students. All studies showed positive results, but each study had its strengths and weaknesses. Few interventions had positive results for all types of students and/or all aspects of reading. Early identification and knowing the needs of each student is essential to provide the most effective, appropriate intervention.

**Chapter I – Introduction**

“Learning to read is a prerequisite for success in our literate society” (Hines, 2009, p. 21). The studies and theories revolving around reading are numerous. Researchers and teachers ponder many questions about reading, but many answers are ambiguous. “The abundance of information now available about how to teach reading effectively provides teachers more strategies but, at the same time, makes reading instruction more difficult to master” (Menzies, Mahdavi, & Lewis, 2008, p. 67). More research needs to be completed and reviewed to better understand the enigmas of reading and the effects reading interventions have on elementary children who are at-risk of reading disabilities. The more quality research done, the more the students of today and tomorrow will benefit. It is important that we provide all children with strategies to help them become proficient readers.

With so many struggling readers with various reading difficulties, it is imperative that teachers not only identify struggling readers, but know the best reading intervention practices. The literature was reviewed in an effort to find the best, effective practices to intervene with students who are at-risk of reading disabilities. It is essential for students to get the proper
instruction needed for them to find accomplishment in the classroom. Achievement in reading can affect success in every subject area in a child’s school day as well as their future success in pursuing a career.

**Background of Problem**

Many reading interventions are used to help students at-risk for reading disabilities succeed. Several studies and theories have addressed reading since the early 1900s. Dating back to the 1970s, many landmark studies have been done on reading. In recent years, the focus of many studies has turned to the effects reading interventions have on students. Several questions remain surrounding the topic of reading, including the possible benefits of reading interventions.

**Purpose of Study**

Reading achievement is essential for school achievement (Reis, McCoach, Little, Muller, & Kaniskan, 2010). Reading is one topic that is used in all aspects of the school day. Whether you are walking down the hallway reading posters, reading the directions to the next assignment, or reading a note from your teacher, reading is ubiquitous. If a student struggles with reading, the difficulties will affect more than a single subject area.

A student who is at-risk is hard to define. Many factors could place a student at-risk (Swanson, et al., 2011). Many kinds of struggling readers could be candidates for intervention (Gustafson, Falth, Svensson, Tjus, & Heimann, 2011). Numerous teachers and researchers are seeking evidence to help identify or prevent reading disabilities (Swanson et al., 2011). A need exists for thorough research on how well interventions work and the most effective intervention techniques. “It is important to know that a student who achieves at a low level academically is not automatically LD” (Sze, 2009, p. 1015). We need to find the best ways to teach these struggling readers.
Theoretical Framework/Model

Reading is a hot topic in education research. Because reading is vital to elementary education, many theories have been formed over the years. The cognitive stages theory of Piaget, the social development theory of Vygotsky, the constructivist theory of Bruner, the functional literacy theory of Sticht are all pertinent to reading. The script theory of Schank and the connectionism framework of Thorndike can also be associated with reading through comprehension (Kearsley, 2011).

Besides being able to incorporate theories to reading, theories are made about reading. One landmark reading theory is founded by the principles of perceptual development, as noted by Gibson and Levin (1975). The seven keys of Gibson and Levin’s (1975) theory are distinctive features, invariant relations in events, higher order structures, abstraction, ignoring irrelevant information, peripheral mechanisms, and reduction of uncertainty. With an emphasis on the different types of reading and various readers, Gibson and Levin have done much research into the psychology of reading.

A landmark, inclusive investigation of troubles associated with learning to read was completed by Resnick and Weaver (1979). The results of the examination lead Resnick and Weaver (1979) to conclude about the dependency of the early stages of reading to letter-correspondence. With time, Resnick and Weaver (1979) believe in an increasing significance of semantic-linguistic features. The study looked into the significance of decoding, the nature of reading skills, the relationship between reading and language, the factors that interfere with learning to read, and the acquisition of reading competence. The studies of Resnick and Weaver
(1979) suggest there may be an association between a reading skill, such as decoding, and becoming a competent reader, which leave many questions unanswered for the reader.

Research Questions

To what extent do various reading intervention strategies affect k-5 student progress in reading?

How does the use of early intervention affect k-3 student reading progress?

Which intervention strategies work the best to teach reading?

How can the same strategies be used to teach reading to all students?

Finding Research Articles

To finding quality articles, a search was done in Northern Michigan University’s “One Search” engine. “One Search” is an engine that includes only scholarly, peer-reviewed articles. I used a variety of search words to find the articles used in this review. Articles were chosen based on their relevance to the topic. The studies needed to be recent (within the past ten years) and involve students that were at-risk of or have reading disabilities. The students also needed to be in kindergarten to fifth grade in an education setting. Articles chosen were original studies, a syntheses, or meta-analyses of other studies. Quantitative data was needed, but qualitative data was also accepted in addition to quantitative data within an article. Although the article qualities varied, the analysis completed took these variances into consideration.

Definition of Terms

At-risk readers. “Conditions that place children at risk for reading difficulties include poverty, cultural and linguistic difficulties, neurologically based problems, inadequate
instruction, limited development-enhancing opportunities, or familial history of reading disabilities” (Swanson et al., 2011, p. 2).

**Bottom-Up Processing.** “Phonological abilities and word decoding skills” (Gustafson, Falth, Scensson, Tjus, & Heimann, 2011, p. 3).

**Dialogic Reading.** “The storytelling role is gradually shifted from the adult reader to the child through various techniques” (Swanson et al., 2011, p.10).

**Encoding.** “Encoding instruction is not limited to just teaching spelling patterns and memorization skills. Encoding instruction also includes explicitly teaching beginning readers and spellers to write words according to their phoneme-grapheme correspondences, to build words using manipulatives (e.g., letter tiles, plastic letters, etc.), and to learn to manipulate phoneme-grapheme relationships to make new words (e.g., pat and tap, stop and pots) (Weiser & Mathes, 2011, p. 3).

**Onsets and Rimes.** “An onset in a syllable is the initial consonant(s) (e.g., the c in cat); the rime comprises the vowel and consonants that follow (e.g., the at in cat)” (Hines, 2009, p. 21).

**Phonological Training.** “Theories which address phonological skills describe development in terms of word-level skills, such as a ‘full alphabetic phase’, where the reader is not only able to form alphabetic connections but can also map phonemes and graphemes on to sight words, and a ‘consolidated alphabetic phase’ where recurring letter patterns become consolidated” (Hurry & Sylva, 2007, p. 2).
**READ 180.** “READ 180 aims to address the diversity in student reading profiles by providing differentiated instruction in each of the components of reading: phonemic and phonological awareness, fluency, vocabulary, and reading comprehension” (Kim, Capotosto, Hartry, & Fitzgerald, 2011, p.4).

**Reading Recovery.** “In Reading Recovery lessons children are shown how to self-monitor, to check their understandings using all the strategies available to them, to predict and to confirm. In other words they are shown how to develop and make use of meta-cognitive strategies in their reading” (Hurry & Sylva, 2007, p. 3).

**Response to Intervention Models (RTI).** “RTI models often employ interventions validated for improving reading of children at risk for reading disabilities” (Tran, Sanchez, Arellano, & Swanson, 2011, p.2)

**SEM-R.** “The SEM-R’s three phases follow this learning approach, as Phase 1 focuses on exposing students to brooks, Phase 2 incorporates differentiated instruction, including specific reading strategy instruction, applied to self-selected independent reading, and Phase 3 allows students to pursue self-selected enrichment activities and projects related to reading” (Reis, McCoach, Little, Muller, & Kaniskan, 2010, p. 5).

**Targeted Reading Intervention (TRI).** “TRI provided kindergarten and first-grade teachers with diagnostic strategies designed to facilitate rapid reading progress for struggling students, ongoing professional development, and long-distance coaching via webcams”(Amendum, Vernon-Feagans, & Ginsberg, 2011, p. 108).

**Top-down Processing.** “Comprehension” (Gustafson, Falth, Svensson, Tjus, & Heimann, 2011, p.3).
Chapter II - Review of Literature

Schools everywhere have a focus on literacy. The following literature review contains an analysis of several studies on the effects of reading intervention strategies on elementary students at-risk of reading disabilities. Various interventions were examined to see what extent various reading intervention strategies affect elementary (k-5) student progress in reading. The intervention strategies were also analyzed to see how reading progress is affected by early intervention and the most effective strategies for all types of students in kindergarten through fifth grade. A student’s reading skills are essential, but various conclusions exist about the best ways to teach and learn reading.

How does the use of early intervention affect k-3 student reading progress?

Positive results have been shown by many studies on various reading interventions in the early elementary levels. A lot of support for interventions can be found in looking through several peer-reviewed journal articles. No interventions in the studies show a negative impact on students, although the demographics, interventions, research methods, and quality of the articles vary. In fact, many interventions show a positive effect on all types of students, especially those who are struggling readers. “It is easier to prevent reading difficulties in the early grades before they emerge than to try and remediate them after they become entrenched and intractable” (Coyne, Zipoli, & Ruby, 2006, p. 166).

Response to Intervention models have been found to increase school-aged student achievement relative to control conditions with an effect size of 1.02-1.54 (Tran, Sanchez, Arellano, & Swanson, 2011). Tran et al. (2011) synthesized various English articles with studies written in English to help identify common characteristics of intervention responders and low
responders. One review by Burns, Appleton, & Stehouwer (2005) suggested the number of students in the United States with learning disabilities was reduced to two percent from the government reported five percent. The RTI may reduce the number of special education services. The students used in the studies were from diverse backgrounds, but school aged (6.5 years to 10.08 years of age) and determined to be at-risk of disabilities. All students were receiving tier 1 or tier 2 intervention, but the interventions used varied. A weak correlation was found in the meta-analysis of the differences between responders and low-responders (post-test compared to pre-test) due to substantive changes in performance from intervention. The meta-analysis also suggested students without disabilities respond greater to intense intervention than students with learning disabilities. The effect size was 1.44, but a pre-test was not considered. Not all tests in the studies were the same or administered the same, so that is something to consider.

After reading studies about the effectiveness of onset and rime instruction, Hines (2009), performed a study of her own on seven first grade students from the eastern United States. Upon completion of a screening, the four participating students were those found to be of the seven most at-risk students of all of the first grade students in the district that were given parent consent. The other three students were disqualified due to lack of knowledge, too many absences, and a holiday vacation disruption of the intervention schedule. The screening qualifications measured intervention letter name knowledge, intervention consonant sound knowledge, and recognizing intervention CVC/CVCC words. To be included in the study, the student must identify 80% of the letter names, provide 75% of the consonant sounds, and failure to decode CVC/CVCC words with more than 15% accuracy. Some of the participants were already receiving reading intervention prior to the study. Each of the students during this intervention read eight Rime to Read books. If the student made more than five errors in the first
four books or eight errors in the last four books, the book was reread during the next session.

After completion of the first four books and then again the last four books, a color coded flashcard sort was completed by the child containing the four sets of rimes from the books. After the child completed the sort, it was done again without the color coding. The amount of time each student needed to get through the intervention program varied greatly.

Hines (2009) administered the study with the four first graders on her own, but taped her sessions. Fidelity at an average of 96% was measured by a second party based on how well the script and correction procedures were followed. “The reliability was 86% with a range from 67% to 100% for the measure of instructional words, 89% with a range from 75% to 100% for the measure of near-transfer words, and 91% with a range of 67% to 100% for the measure of far-transfer words (Hines, 2009, p. 26). As a result, the four students found to increase in instructional words by an average of 73% over baseline. The students also had positive results on the near-transfer measure on average of 56% over baseline. Hines (2009) felt that the onset and rime reading intervention was positive.

Substantial progress was shown in the short-term for students with the Reading Recovery intervention compared to the controls. In English schools already teaching Reading Recovery with a trained teacher, nearly four-hundred children age six to six-and-a-half years old were included in the study. With seven months of interventions given by a trained teachers provided by the schools, the effect size was medium to large and the students were believed to have an eight month advantage (Hurry & Sylva, 2007). The phonological training was more specific than Reading Recovery, but not secure. Phonological training was ahead of the controls on phonemic awareness. The effect size was small within school comparison. A significantly
higher effect size was found with between-school comparisons on the Diagnostic Survey. No significant effect on reading was found.

One year after Reading Recovery graduation, the medium term results showed the students were significantly ahead of between-school controls in reading and a lesser extent in spelling. The gap narrowed between the Reading Recovery group and the control shown by the pre and post-tests of the British Ability Scale (BAS) Word Reading test, Neale Analysis of Reading, and the Oddities Test. Other tests were used at times, but not consistently over the years. After the short term follow-up the Reading Recovery students had an effect size of .81 (p<.001) on the BAS, .63 (p<.01) on the Neale Prose Reading, and .87 (p<.001) on the Oddities Test. In the long term, the Reading Recovery students had an effect size of a small .17 in reading/comprehension. The scores suggest the intervention worked in the short term, but did not necessarily sustain its progress over time. Significantly more progress overall in reading and spelling was made by the phonological training group. A small increase in phonological skills was also noticed by the researchers (Hurry & Sylva, 2007).

Four years after the initial intervention was administered, the students were assessed again by the researchers (Hurry & Sylva, 2007). Both interventions were somewhat above the controls, but many intervention effects were negligible or small. The effects were statistically insignificant with the exception of spelling in the phonological training group. Better progress for reading and spelling was significantly associated with phonological training in between-school control groups, but not in the within-school comparison.

The Reading Recovery program is more effective for non-readers where phonological training seemed equal at all levels (Hurry & Sylva, 2011). Both interventions seemed to work in
the short-term. Reading Recovery seemed to improve reading and spelling over a broad spectrum, but had no consistent effect on children’s phonological awareness. The non-readers made significantly more progress than their peers in the control group in long term reading. Phonological training seemed effective at improving phonological awareness in both within and between-school comparisons, but had little short-term effect on reading.

Amendum, Vernon-Feagans, and Ginsberg (2011) used a cluster-randomized design with their study on the Targeted Reading Intervention (TRI) model. Eight schools from five districts in the southwestern United States participated in the study, but one school had to drop out of the study due to technological difficulties. The remaining schools contained 43 classrooms, 26 experimental and 17 control classrooms. Through random assignments, 19 kindergarten and 24 first grade classrooms were placed with the TRI model or the control. Standardized testing was used in the fall and spring of the year and the participating teachers filled out questionnaires. After one year, the researchers examined the students’ growth in word attack, letter and word identification, passage comprehension, and spelling sounds (Amendum, Vernon-Feagans, & Ginsberg, 2011). The TRI model used in the study by Amendum, Vernon-Feagans, & Ginsberg (2011) includes re-reading for fluency, word work, and guided oral reading. In word attack, comparing the experimental students with the control, the experimental school students had significantly higher spring scores ($p < .01$, $\delta = .35$) and had a small effect size of seven $W$ score points. Letter and word identification was similar with experimental school students having a significantly higher spring scores than control school students overall ($p < .02$, $\delta = .34$) and seven $W$ score points, a small effect size. Amendum, Vernon-Feagans, & Ginsberg (2011), also found experimental school students with significantly higher spring Passage Comprehension scores as well ($p < .001$, $\delta = .61$) when compared to the control, and a medium effect size of 11
Experimental school students did not have a significant difference in spelling of sounds assessment scores compared to the control (p> .06). Amendum, Vernon-Feagans, & Ginsberg (2011) felt their results supported the effectiveness of the TRI intervention program. Research has proven that early intervention is the key to helping students catch up with their peers faster (Sze, 2009, p. 1016). It is clear that early intervention in reading for at-risk students has shown positive results. All of the studies have shown success for students. Despite the positive results, it is unclear as to what extent the interventions work in the long term for the students. Which intervention strategies work the best for teaching reading is also an unknown. With the best intervention practices, teachers can provide students with more success and achievement.

Which intervention strategies work the best to teach reading?

A variety of reading intervention strategies seem to be effective on students. More research is needed before anyone can determine which intervention strategies work best. The READ 180 program has also had positive effects on students. Dialogic reading, decoding instruction, a combination of bottom-up and top-down strategies, and SEM-R are known strategies that have produced positive results.

The effects of teacher delivered read-aloud interventions on pre-school age to third graders were studied with a synthesis and meta-analysis of various studies (Swanson et al., 2011). All participants had to be at-risk for reading difficulties due to low achievement in phonemic awareness, vocabulary, or letter identification, lacking exposure to literacy, low socioeconomic status, reading disabilities in the family history, or low reading achievement historically in the school. The study needed to take place in a preschool, daycare, or school and
with a design such as treatment-comparison, multiple treatment, single-group, or single subject research. The intervention needed to include read alouds and have one or more dependent measures assessed and published in a journal. Out of the 29 studies synthesized totaling 2,025 students receiving intervention treatment or used as comparison, 18 of these studies were used for further meta-analysis. The interventions implemented by teachers, paraprofessionals, or researchers were vocabulary, dialogic, repeated reading, limited, or other. The number of sessions varied as well as the size of the student population in each study. The diverse study designs lead Swanson et al. (2011) to believe the synthesis and meta-analysis are more reliable and credible.

Six researchers were trained approximately eight hours in coding the studies in the articles. Two researchers had to code each article and come to a consensus on any disagreements. It is felt the inter-rater reliability was .95 for study characteristic coding and .91 for effect size. Looking deep within the data collected amongst each article, the trained researchers found the dialogic reading was the most causal evidence to support effects on children’s literacy outcomes. The researchers used Cohen’s $d$ to analyze the outcomes of the studies ($d=0.2$ as small, $d=0.5$ as medium, and $d=0.8$ as a large effect). $P$ values were included in the meta-analysis. Dialogic reading had a moderate to large effect on phonological awareness ($p<.001$), print concepts ($p=0.14$), reading comprehension (0), and vocabulary ($p=0.005$). The dialogic reading intervention involves child and adult dialogue and questions around books. Dialogic reading in educational settings is felt to be valuable by Swanson et al. (2011). With many studies using dialogic reading interventions and success shown, more confidence is given to the results.

Decoding has been a topic of studies and theories for many years, including the inclusive investigation work of Resnick and Waver (1979). The importance of encoding instruction has
also been studied (Weiser & Mathes, 2011). Through the use of analysis and syntheses, the authors provide empirical evidence to support their directional hypotheses that encoding instruction will enhance student abilities to read and spell. A total of 960 students between kindergarten and third grade that read below a third grade level were involved in the eleven studies. Each study was administered in a variety of ways for different amounts of times, but each study was using encoding interventions.

After studying theories and results, the researchers feel they have the evidence needed for a reasonable, informed conclusion (Weiser & Mathes, 2011). The qualitative and quantitative evidence points to both special needs and general education students benefiting from encoding instruction. When encoding instruction is integrated with decoding instruction, the researchers believe substantial gains are made in phoneme awareness, alphabetic decoding, word reading, spelling, fluency, and comprehension. All of the studies showed positive effects for struggling readers and spellers as well as decoding instruction as a context for teaching phoneme–grapheme correspondences, blending, and segmenting. The average Cohen’s $d$ effect size for spelling was 0.60. Cohen’s average $d$ effect size was 0.84 (SE = 0.07), supporting the importance of helping struggling readers with encoding instruction to benefit the alphabetic principle. Encoding instruction shows benefits for phonemic awareness with an average Cohen’s $d$ effect size of 0.87 (SE = 0.08). Results from the various studies showed encoding and decoding instruction together increased reading skills of real and non-words (mean Cohen’s $d = 0.70$).

A longitudinal study of 130 second graders was developed to study the effect of three intervention programs. A bottom-up intervention (COMPHOT), a top-down intervention (Omega-IS), and a combination of the two interventions were used in the study. Two comparison groups were used by the researchers (Gustafson, Falth, Svensson, Tjus, & Heimann, 2011). One
group with 25 students received special education where one group of 30 students received typical instruction. Tests were administered by one of the authors and 13 psychology students with training. Training in test administration was provided during their courses as well as through workshops. The tests measured comprehension (Vilken bild är rätt? and Woodcock Reading Mastery Test–Revised), decoding (Word-chaina tests), sight words (Test of Word Reading Efficiency), and pseudoword reading (list of pseudowords). With 52 special education teachers representing 41 Swedish schools were a part of the study. Learning disabled students were included in each intervention and special education teachers were part of each intervention group as well. Each student had to received 25 sessions of at least 10 minutes. All groups showed improvement. The 11 one-way ANOVAs comparing the means of the five groups all revealed significant main effects of group (all ps < .05).

With the combination intervention showing the most improvement, large effects were found on all five dependent variables (reading comprehension, passage comprehension, word decoding, sight word reading, and pseudoword reading). Five separate split-plot ANOVAs showed all ps<.01. Phonological training alone left large effects on reading comprehension, word decoding, and sight word reading. A moderate to large effect was also the result of phonological training on passage comprehension. Phonological training led to a small to moderate effect on pseudoword reading. Comprehension training left large effects on passage comprehension and sight word reading. Moderate to large effects were found on word decoding and pseudoword reading from comprehension training. A moderate to large effect on reading comprehension was found by the researchers (Gustafson et al., 2011).

For a more general and reliable measure of improvements, the researchers transformed scores in two standardized values (Gustafson et al., 2011). Combined training showed
significantly higher improvements in reading skills than the ordinary and typical groups \( (p < .05) \). The interventions were of moderate intensity and the characteristics of the participants affect the intervention outcome.

The Schoolwide Enrichment Model-Reading appeared to affect fluency differently across the United States in five diverse elementary schools. Thirty-seven second to fifth grade classrooms used the intervention and 33 second to fifth grade classrooms were used as control. A correlation between fluency and Iowa Test of Basic Skills post-test of .74 was found in the researchers’ analysis of the data (Reis, McCoach, Little Muller, & Kaniskan, 2011). Significant differences were found between the control and treatment groups. Comprehension, as measured by the ITBS, was analyzed through an unconditional random effects ANOVA model. An ICC of .491 showed a 49.1% variance in reading comprehension between classrooms.

Although the results suggest a positive treatment effect in one urban school, no significant effect was shown in the other four schools (Reis et al., 2011). The SEM-R outperformed the control in reading fluency in one suburban school and showed some benefit at an urban school in reading comprehension. The attitude of the teachers did not appear to have significance. The SEM-R groups are believed to be greater engaged and have more enjoyable reading experiences. No detriment was found to students using SEM-R, so the researchers concluded that SEM-R works as well as or better than traditional approaches to reading instruction. However, the study did have limitations in fidelity, which are hard to quantify, random assignment, and an uncertainty in which activities worked. Also, no measurement is found for engagement and the researchers had a lack of SES data that could affect results.
How can the same strategies be used to teach reading to all students?

The reading intervention strategies that were researched seem to provide little to significant positive effects on all students. The many types of readers and reading difficulties may contribute to the lack of significant positive effects on all students. A landmark theory by Gibson and Levin (1975) focused on the psychology of reading and the variety of readers and types of reading. Some intervention strategies seem to work better with certain types of students, but no detriment to students has been found. The studies by Kim, Caposto, Harty, and Fitzgerald (2011) as well as Gustafson et al. (2011) are two studies that show positive effects on students that have no reading difficulties.

With an empirical strategy, Scholastic’s READ 180 program was analyzed on fourth through sixth grade students from a mid-sized urban district in southeastern Massachusetts. The students took the Massachusetts Comprehensive Assessment System (MCAS) and 95% were not proficient (Kim et al., 2011). Trained observers came to watch the teachers hold their READ 180 classes during school as well as at the after school program to check fidelity of the study. Measuring the effectiveness of the program on vocabulary, reading comprehension, spelling, and oral reading fluency on fourth through sixth grade participants, Intent-to-Treat (ITT) estimates and Treatment-on-the-Treated (TOT) estimates were used by the researchers. ITT estimates for READ 180 shows an effect of p<.05 for vocabulary, p<.01 for comprehension with the classroom model, and p<.10 for oral reading fluency. TOT estimates for READ 180 shows an effect of p<.05 for vocabulary, p<.01 for comprehension, and p<.10 for oral reading fluency. The study had a positive effect size of .23 for vocabulary and .32 for reading comprehension. No statistically significant impact was found on spelling or oral fluency. The effects did not differ across grade levels four to six, so consistency is implied.
A longitudinal study resulted in the comparison groups of ordinary special education instruction and typical readers showing improvements on the post-tests (Gustafson et al., 2011). Activities in ordinary special instruction included reading aloud and/or silently, discussions, spelling, phonological awareness instruction, and memory work. It was less systematic and less focused than the other interventions. The ordinary special education instruction led to a large effect on sight word reading, a moderate to large effect on reading and passage comprehension, and small to moderate effect on pseudoword reading. Typical readers showed a moderate effect on reading comprehension, moderate to large effect on word decoding and sight word reading, and a moderate to small effect on passage comprehension and pseudoword reading. The intervention seemed to work on all types of students involved in the study.
Chapter III - Results and Analysis Relative to the Problem

“The early and accurate identification of children with disabilities is critical to ensuring that students receive services that will help them to be successful academically” (Bradley, Danielson, & Doolittle, 2005, p. 485). The state of Michigan allows the RTI model to help determine eligibility for learning disabilities. “RTI is most appropriately characterized as a preventive, multi-tiered process of instruction and assessment designed to enhance early identification of students who exhibit deficits in basic skills relative to developmental expectation and who are, therefore, at risk for falling further behind without instructional modifications” (McKenzie, 2009, p. 203). “Students are screened and those students identified as at risk or struggling in academics or behavior become a part of a problem-solving process” (Chambers, 2008, p. 8). In this three-tiered approach, no specific intervention program is required, but it is vital to provide these struggling students with the interventions best suited for them. The need for early intervention, its best strategies and how to most appropriately utilize these strategies in the classroom is research needed to find the most effective interventions for struggling readers. However, one thing was obvious, positive effects were seen from providing students with reading intervention and early intervention is beneficial. Now, the question is not if to do it or when to do it, but how to best do it. Effective intervention is essential and there is no one intervention program that can be called best or most appropriate for all.

The research reviewed showed positive effects from the RTI model, reading intervention through onset and rime, Reading Recovery, the READ 180 program, the TRI model, dialogic reading, decoding instruction, a combination of bottom-up and top-down strategies, and SEM-R. The literature reviewed encourages the use of reading interventions in schools. Denton (2012) determined aggressively addressing the at-risk reader’s weaknesses in the early stages of reading
acquisition will prevent more serious reading problems. The positive results support the effectiveness of reading intervention, but the extent to which it is effective is not certain. Although the results are encouraging, it is uncertain as to which interventions are most effective for our students.

**How does the use of early intervention affect k-3 student reading progress?**

Much research has been done about early intervention in reading. The results have been positive and suggest early intervention can be valuable. Early identification of at-risk students seems to be an essential part of the intervention process.

The synthesis and meta-analysis completed by Tran et al. (2011) shows positive results for Response to Intervention in reducing the number of students that need special education services. A positive of an analysis of many articles is the sample size is often larger with various populations are represented than in a single study. Unfortunately, the weakness is that with analyzing someone else’s work, there is room for error through misinterpretation. In a synthesis and meta-analysis the reader also doesn’t often see the whole picture for each represented study.

Hines (2009) studied onset and rime. The first grade students increased instructional words and near-transfer measure by an average of 73% and 56% over baseline. Limitations of the study were that it was completed by Hines herself and only four students participated in the full study. It is unknown how effective one portion of the program was because it not only included the rime books, but flashcards and color coding as well.

Hurry & Sylva (2011) studied Reading Recovery and phonological training with students. The results showed the effectiveness of the Reading Recovery is more positive for non-readers. Spelling and reading improved with Reading Recovery, but phonological awareness was not
notably affected. The phonological training seemed more consistent with all students and showed to be effective with phonological awareness, but very little effect on reading. The short-term results for both studies were impressive, but did not last to that extent over time. The strength of this study is that many students were studied over a long period of time. The short and long term effects were given, unlike many of the other studies.

The TRI model study by Amendum, Vernon-Feagans, & Ginsberg (2011) researched re-reading for fluency, word work, and guided oral reading. One strength of the study is that it included seven schools, although all were located in one area of the United States. It also needs to be considered that the intervention was not only used with at-risk students. The intervention was provided in the general education setting by the classroom teacher with assistance through professional development, technology, and a coach. Although some of the effect sizes were small in support of TRI, Amendum, Vernon-Feagans, & Gibsberg (2011) felt that TRI was a beneficial intervention.

**Which intervention strategies work the best to teach reading?**

Swanson et al. (2011) believe the variety of study designs used in the many studies researched make a sounder synthesis and meta-analysis. Thousands of students involved in the studies increase the strength of the meta-analysis. Amongst the read aloud studies that Swanson et al. (2011) analyzed, dialogic reading was found to be a positive intervention with students. Moderate to large effects were found in several aspects of reading.

Research by Weiser & Mathes (2011) on eleven studies with qualitative and quantitative evidence that shows all students benefit from encoding instruction. Greater gains in phoneme awareness, alphabetic decoding, word reading, spelling, fluency, and comprehension was found
through the combination of encoding and decoding instruction. Nearly one thousand k-3 students were included in the eleven studies, which is a strength of the analysis. All used encoding as an intervention, but one weakness is that not all of the studies used a decoding component. Not all students were at-risk students either, the studies used a variety of students and all benefited from the intervention.

Significant effects were found with all groups in the research of Gustafson et al. (2011). With 150 students of diverse needs, 52 special education teachers, and 14 trained testers, the study included bottom-up, top-down, and a combination intervention. The combination intervention had the best results. Limitations included were that a combination was a broader program with no way to determine which part(s) of the intervention works. The students also had different intervention experiences and effects based on which teachers taught the different groups. More participants may also be needed.

The SEM-R study’s limitations were in fidelity and an uncertainty in which activities had the positive outcome (Reis et al., 2011). The researchers could not measure engagement and had a lack of socioeconomic status data that could affect results. Also, the positive results were not seen in all schools, but no detriment was found using the program.

There doesn’t seem to be one encompassing answer for reading intervention for all students. Many of the programs have strengths with one type of student, but are not necessarily the best fit for all types of readers. Fortunately, none of the literature reviewed has suggested negative effects on students. Although using one intervention program for all students does not seem to be the best answer, it does seem that while some students can benefit greatly, others will see little results. Using a combination of interventions seems to have the best results.
How can the same strategies be used to teach reading to all students?

Kim et al. (2011) studied READ 180 in late elementary students in Massachusetts. READ 180 is felt to be a program that may be better for moderate at-risk students rather than low students. Trained observers watched the fidelity of the intervention sessions. Although many reading aspects showed positive effects, spelling or oral fluency did not show positive effects. Due to a need for a longitudinal study and replication to test external validity, the researchers feel their study is limited. A larger, more geographically diverse sample could also be beneficial to this study. From this research, READ 180 does not seem to be the best intervention for all students, but rather is beneficial for the specific population of late elementary students who are only moderately at-risk.

The longitudinal study by Gustafson et al. (2011) included reading aloud and/or silently, discussions, spelling, phonological awareness instruction, and memory work. Positive effects were shown by all types of students, especially in the combination intervention. Bottom-up and top-down intervention both seem valuable, but together the results are more promising. This suggests that using a combination of interventions may be the best way to meet the needs of all students.

More research is needed to show the significance of the effectiveness of the various reading interventions. Further research on the long term effects reading interventions have on students’ reading abilities is needed to gain a clearer picture of what works best for students. Without knowing both the short and long term results of these interventions through further research, it is impossible to fully understand the effectiveness of reading interventions. It also is
important to consider that our students all learn differently and therefore more than likely will
not be one program that is effective and best for all students.
Chapter IV - Recommendations and Conclusion

Recommendation

The articles reviewed contained studies on various reading interventions as well as information about the RTI process and the importance of intervention with our at-risk readers. The studies show positive results for a variety of reading interventions. No interventions in the studies reviewed had a negative impact on the students. In fact, many interventions show a positive effect on struggling readers, as well as other students. Because of the positive results, one can infer that reading interventions should be used in all schools. There are interventions that can be used as a whole class, as well as in small groups for those students whose needs are better met with more intensive interventions.

Providing early intervention can help students find more success in reading. Early intervention is thought to help prevent reading disabilities and can help provide students the skills they need to have better achievement in the classroom. However, that does not mean teachers should give up if a student did not receive intervention at a young age. Success can be attained by students in their later elementary years as well. The need for intervention is obvious, but which interventions are most effective is the tough question to answer.

Many interventions are tried in today’s classrooms. The best environment for an intervention is in a small group, but teachers should also use intervention strategies in the large classroom. Early intervention is best, but intervention at any age is valuable. The age group and specific needs of the students can help the teacher determine which intervention is most effective.
The small onset and rime intervention of Hines (2009) would need further research to find if it is truly effective. Hurry & Sylva (2007) had positive results in the short term with phonological training and Reading Recovery. Both interventions seem worth using on certain students, phonological training for students struggling with phonemic awareness and Reading Recovery for reading, but both lack what the other has. Together, Reading Recovery and phonological training could fill in the gaps the other misses. Because significant effects were found with all types of students in the research of Gustafson et al. (2011), more research on the bottom-up and top-down combination intervention strategy would be beneficial in proving its effectiveness. The results seen thus far seem promising. The TRI model study showed some small, but positive effects in the general education classroom by Amendum, Vernon-Feagans, & Ginsberg (2011). Dialogic reading had positive results with young kids in phonological awareness, print concepts, reading comprehension, and vocabulary (Swanson et al., 2011). Weiser & Mathes (2011) found a combination of decoding and encoding instruction was good for students who need gains in phoneme awareness, alphabetic decoding, word reading, spelling, fluency, and comprehension. This combination of interventions may be worth trying on students with many needs. The SEM-R study had some positive effects in fluency and comprehension, but the results were not consistent amongst all schools (Reis et al., 2011). READ 180 was found beneficial for moderate at-risk students in late elementary during the study by Kim et al. (2011). Knowing the needs of the students is valuable to give them the best intervention.

Many students have had positive effects from several types of reading intervention strategies. Some positive results have been shown for the RTI model, reading intervention through onset and rime, Reading Recovery, READ 180, the TRI model, dialogic reading, decoding instruction, a combination of bottom-up and top-down strategies, and SEM-R.
Although the students have been shown to benefit from these different types of interventions, there does not seem to be one best intervention or one intervention that is the best fit for all types of readers. Without further research, the results of the most effective reading interventions are inconclusive.

**Areas for Further Research**

Little to significant positive effects on all students were found in the studies analyzed. Students do not fit in a one-size-fits-all mold. The lack of significant positive effects on all students may be due to the many types of readers and reading difficulties. No detriment to students has been found, but some intervention strategies seem to work better with certain types of students. Although more research is needed, one best reading intervention may never be found. However, with the many great reading interventions available, any teacher should be able to find what is needed to help all students succeed.

A study that utilizes a variety of reading interventions is needed for further research. Each intervention would need to be used with similar groups of students found to be at-risk of a learning disability in reading. This study would begin by identifying at least one hundred young struggling readers in kindergarten that come from at least ten different rural schools. The students will be identified through standardized testing (such as DIBELS) and should come from similar backgrounds and environments. The gender of students will be noted, but not determine eligibility. The study will follow their scholastic journey through at least fifth grade. This will not include transfer students unless the student completely fits the demographic criteria of the study and has the sufficient previous data needed to be included in the population. Some students (such as transfer students) may receive intervention services, but not be included in the data of
the study. This would help determining the effectiveness of the interventions in both the short and long term.

All students participating in the study would be monitored at least three times a year with the same assessment (such as DIBELS). Considering the downfall that no two groups of students can be the exact same, the assessments should be kept as standardized as possible. The same reading assessments should be administered to all students, no matter which intervention is being used. The assessments should measure various aspects of reading such as fluency and comprehension. With a study done in this way, there would hopefully be a clearer picture as to the effects of various reading interventions on elementary students. Completing this study with trained interventionists, more than one hundred students, and a variety of rural schools would ensure clearer, more accurate results.

The researchers in a comparison study over six years would have the chance to see the effects of various interventions and be able to evaluate the results in the short term as well as examine longer lasting effects. Observing lasting effects is an important component to have. Including the bottom-up and top-down combination intervention and the combination decoding and encoding intervention are recommended. It would also be interesting to see the combination of Reading Recovery and phonological training together in an intervention. When comparing the programs, it is essential to notice trends of whether the students were able to leave intervention and be successful in the general education classroom, were labeled with a reading disability and needed more intensive intervention, or needed to continue the intervention support given to maintain and increase their skills.
Summary and Conclusion

With the vast amounts of research on reading intervention, it is difficult to sift through and obtain the information needed. All of the literature reviewed was positive. The studies showed that reading intervention is effective and early intervention is recommended. Surprisingly, with all of the research available, the information about reading interventions still seems quite vague when it comes to the effectiveness of reading intervention on elementary students at-risk of reading disabilities. Even with more research, a best fit intervention program for all students does not seem possible. Everyone is different and has diverse strengths and weaknesses. It is important to value the diversity of students and find what best meets their needs. Teachers need to use the best intervention strategies to help support all students. Reading intervention is a valuable part of our schools and differentiated instruction is vital to successful teaching. It is imperative that all students get the support needed for growth and achievement.
References


