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Effective Methods of Teaching Phonological Awareness and Phonics to Individuals With Reading Difficulty

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EFFECTIVE METHODS OF TEACHING PHONOLOGICAL AWARENESS AND PHONICS TO INDIVIDUALS WITH READING DIFFICULTY

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Abstract

Reading struggles have been a constant and pervasive issue for individuals. Reading struggles can be caused by various factors, such as poor reading instruction or, in some cases, a reading disability. Throughout the decades, there have been many schools of thought on the most effective ways to teach reading. In this body of research, the literature provided explores studies that report on effective methods to teach phonological awareness and phonics skills using systematic and explicit methods. In addition, studies comparing explicit and systematic methods of instruction to instructional methods that are not categorized by explicit and systematic methods are explored. Based on the research provided, individuals with reading difficulties, when given explicit and systematic methods of instruction in both phonological awareness and phonics skills, made significant gains in their reading ability. This suggests that providing reading instruction in a systematic and explicit way is the effective way to teach individuals with reading difficulties.

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CHAPTER I: INTRODUCTION

The Formation and Implications of the National Reading Panel

In the last 25 years, the knowledge surrounding and attention toward methods of reading instruction has grown exponentially. In 1997, Congress approved the formation of the National Reading Panel (NRP). The NRP was established to create a national, comprehensive, research-based group to guide the instructional approaches to reading and the development of legislature surrounding literacy instruction (Ram'rez, 2001). Shortly after the inception of the NRP, they published their first research report in 1998 titled *Preventing Reading Difficulties in Young Children*. This report dealt with three main topics: alphabetics, fluency, and comprehension.

The Panel studied each of these topics in-depth and eventually published a second report in 2001 titled *Teaching Children To Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction*. One result of this report was the formation of the No Child Left Behind Act (NCLB) of 2001 (Lee, n.d). This law applied to every K-12 public school in the United States. At its core, NCLB was put in place to provide educational opportunities for students in poverty, students of color, students receiving special education services, and students who spoke and understood limited or no English. The NCLB Act helped to keep schools accountable for how children learn with a specific focus on disadvantaged children (Lee, n.d). In 2015, the Every Student Succeeds Act replaced the NCLB Act. This new law picked up where NCLB left off with a few added updates.

Another implication that came from the *Teaching Children To Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction* report was the conclusion that students being given direct, systematic, and explicit phonemic and phonics instruction is essential to improving reading and spelling skills (Langenberg, n.d). This recommendation came from the research that the NRP completed regarding phonemic awareness and phonics instruction. They studied if both elements were essential for a child to be able to read and what methods of phonemic awareness and phonics instruction yielded the best results.

In their research, the panel found that many of the difficulties for a child learning to read came from a lack of phonemic awareness instruction and that systematic and explicit instruction created direct improvements in the children's ability to read and spell (*Teaching Children To Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction. Reports of the Subgroups.* 2000). Because of this finding, the NRP stated that explicit instruction of phonemic awareness should be an essential component of reading instruction as early as preschool. The NRP also concluded from their research that explicit, systematic phonics instruction is also an essential component of reading instruction. They specifically noted that the systematic instruction that helped the struggling readers was a systematic sequence of phonics skills rather than highlighting the phonics skills as they appeared in the text (Langenberg, n.d). They made the conclusion that systematic phonics instruction benefits all students but specifically benefits

those that have difficulty reading. The NRP recommended that direct, systematic instruction in both phonemic awareness and phonics instruction should be provided as early as possible for students showing signs of reading difficulty (Langenberg, n.d).

Reading Wars: Reading Instruction Through the Decades

Throughout the decades, there have been many trends and ways of thinking surrounding the best way to teach a child how to read (Moats & DC., 2007). Beginning in the 1960s, the primary focus was on reading whole words through the tactic of memorization and repetition. This was referred to as the "Look/Say" method where children would be taught words through the use of flashcard drills (Gear, 2021). The goal was that a child would memorize enough words, generally thirty to fifty, so that they could begin to read the basal readers. Any unknown words were usually paired with a picture to help the child identify the word. The most common example of this is the Dick and Jane series.

In the late 1970s the Whole Language method became popularized (Gear, 2021). The Whole Language approach was an approach where the goal was for the reader to gather meaning from the text in combination with their own personal connections and experiences. In this movement of reading, the systematic teaching of phonics was rejected. Phonics, decoding, and spelling were addressed when doing word studies or in writing but were not explicitly or systematically taught (Gear, 2021). When a child came to an unfamiliar word, they were told to guess the word by using the context surrounding the word. The thought behind this was that children would discover the letter and sound

relationships that were necessary for them as they read books whether the children could actually read what was on the page or not (Moats & DC., 2007).

According to Gear (2021), after a decade of not teaching children how to read, the pendulum of reading swung again and this time landed somewhere in the middle of Whole Word reading and the Whole Language method. The new term Balanced Literacy was introduced in the 1990s and was widely used until the 2000s. Balanced Literacy consisted of leveled readers, using the three-cuing method, and this method began to bring phonics back into view. Balanced Literacy introduced leveled readers that focused on meaning and used repeated high frequency words (Gear, 2021). The three cueing system was taught to children to help them with unknown and unfamiliar words. Students were taught to ask themselves three questions regarding meaning, structure, and the visual of the word. First, they ask “Does it make sense in the story?” Second, “Does it sound right?” And finally, “Does it look right?” Instructing students in systematic and explicit phonemic awareness and phonics was included in the Balanced Literacy movement but it was certainly not the primary goal (Gear, 2021).

Around 2010, the new term Science of Reading (SOR) came about. The Science of Reading is a “vast, interdisciplinary body of scientifically-based research about reading and issues related to reading and writing” (The Reading League, 2022). According to The Reading League (2022), this body of research is designed to provide the evidence to inform how reading and writing develop proficiently, gain a better understanding of why some individuals struggle with

reading and writing, and how educators can use these findings to effectively teach and assess reading and writing to improve student outcomes.

One of the principles within SOR is Scarborough's Reading Rope. This visual metaphor that represents all the necessary components that need to be taught and learned to execute skilled reading. The skills that are necessary fall into two categories: language comprehension and word recognition. Under language comprehension the skills listed are background knowledge, vocabulary, language structures, verbal reasoning, and literacy knowledge. The skills listed under the category of word recognition are phonological awareness, decoding, and sight recognition (The Reading League, 2022). Scarborough's Reading Rope can be simplified to illustrate another principle within SOR called the Simple View of Reading. This view is endorsed by more than one hundred and fifty studies according to The Reading League (2022). In short, the Simple View of Reading states that reading comprehension is the product of word recognition and language comprehension. If either of the components is weak, reading comprehension will deteriorate (The Reading League, 2022). To build strong skills in word recognition, SOR endorses systematic and explicit instruction of phonemic awareness and phonics skills as well as using connected texts to build reading fluency and comprehension. Examples of research-based methods aligned with SOR to teach language comprehension are explicit instruction in grammar structures and engaging in robust conversations and texts to build knowledge and vocabulary (The Reading League, 2022).

Research Questions

The broad research question for this thesis is “What are the effective methods to teach phonological awareness and phonics to individuals that have reading difficulty?” This question was posed because many educational settings are re-evaluating the way that reading is taught. It is crucial for educators to use research-based practices to inform their reading instruction.

When children start to exhibit reading difficulties, the metaphorical timer starts counting down. If reading difficulty is not caught and given effective intervention early enough, the child has the potential to never catch up to their grade level peers. Research-based practices are important so that all students learn to read effectively but are crucial for students that have reading difficulties.

CHAPTER II: LITERATURE REVIEW

Literature Search Procedures

When locating the literature for this thesis, searches were completed through EBSCOhost ERIC, LibSearch, and reference lists from the literature that were initially found on the databases listed. The research was narrowed to considering studies that were peer-reviewed that focused on reading development in the areas of phonological awareness and phonics. The key words that were used in these searches included “reading instruction,” “phonological awareness,” “phonemic awareness,” “explicit phonics instruction,” “explicit and systematic reading instruction,” “reading disabilities,” “dyslexia,” and “best practices.” The structure of this chapter is to provide a review of the

literature on the practices within the Science of Reading that help struggling readers. The three categories that will be explored are Explicit and Systematic Phonological Awareness Instruction, Explicit and Systematic Phonics Instruction, and Comparing Direct Versus Indirect Methods of Instruction.

Systematic and Explicit Phonological Awareness Instruction

Before a child can learn to read, they need to have a strong foundation of how to manipulate phonemes in a spoken word. This is a skill under the broad category of phonological awareness. Boyer and Ehri (2011) believed that children require explicit instruction to learn how to segment and blend phonemes within words. Because of the pivotal role that phonological and phonemic awareness plays in learning to read, Boyer and Ehri (2011) conducted a study on multiple methods to enhance phonemic awareness instruction for children who were not yet reading. The study consisted of sixty students in preschool. All the children knew at least fifteen letter names. The children were then placed in one of three groups of instruction: letter only, letters combined with auditory pictures, and a control group. Pre and post testing was administered to measure the success of the strategies.

In all the treatment groups the teachers used a small group approach using explicit and systematic methods of instruction to teach phoneme segmentation and blending. In the group that used letters combined with auditory pictures, the teacher used letters alongside a visual representation of what the child's mouth should be doing to form the sound. In addition to the visuals, the children were

instructed to use a mirror to see what their own moth was doing when making the sounds. In the letter-only method, the teacher used only letters when teaching the children how to bend and segment phonemes (Boyer & Ehri, 2011).

At the end of the study, both experimental groups outperformed the control group of children. The students that received the letter and auditory pictures method of instruction scored higher in the areas of phoneme segmentation, spelling, and nonword reading on their post-test. By using a more multisensory approach to teaching phonemic awareness, the students were able to progress quicker in their pre-reading and reading skills (Boyer & Ehri, 2011).

As Boyer and Ehri (2011) stated, phonological awareness is an essential skill for a child's reading development. Clayton (2020) and his team of researchers conducted a study in England to understand the indicators that could predict reading development using early developing reading skills. The study sample consisted of one hundred ninety-one children ranging from ages four to five. The indicators that were tested and studied were phoneme awareness, letter-sound knowledge, rapid automatic naming, and letter-sound knowledge (Clayton et al., 2020). Students were assessed four times during the academic school year to measure their growth in the early reading skills. The team of researchers did not design an intervention for these students; rather the study was centered around the assessment they designed to discover and predict any trends in early reading skills.

As the researchers expected, the measures of reading, letter-sound knowledge, phoneme deletion, and rapid automatic naming were all correlated at each data point. In addition, the researchers saw the phonemic awareness scores increase at each testing period as well. A more specific area that was examined was the data relationship between initial letter-sound knowledge and reading skills. They found that when the students had a weaker knowledge of letter-sound correspondence, they also had a weaker score in reading. Some of the participants were not yet reading for the first two testing periods. The researchers found that these students had a delayed rate of letter-sound acquisition as measured by their assessment (Clayton et al., 2020). They ultimately concluded that phonemic awareness, letter sound knowledge, and rapid automatic naming could all be used as predictors of a child's reading development.

Kozminsky and Kozminsky (1995) completed a longitudinal study to determine the relationship between phonological awareness and reading success in first through third grade. A total of seventy kindergarten students from the same elementary school participated in this study. The group was split in two groups: experimental and control. The classes had an average range of high to low reading abilities. The experimental group of students received eight months of phonological awareness intervention. The phonological awareness instruction included identifying and creating rhymes, segmenting words into sounds and syllables, blending sounds and syllables into words, counting

syllables, and phoneme deletion. The students in the experimental group received the instruction two times a week for twenty minutes at a time. The control group participated in the general language arts curriculum without the addition of direct phonological awareness instruction.

The students were assessed at different times during the longitudinal study. Once before the interventions began in kindergarten and again at the end of first grade. Students were tested on their ability to detect rhymes, blend and segment words, and phoneme deletion (Kozminsky & Kozminsky, 1995). Additionally, the student's reading comprehension was tested at the end of first and third grade.

After the four year long study, the data was compiled and analyzed. Some of the participants from the original experimental kindergarten class were not able to be counted in the results because they no longer attended the school. Kozminsky and Kozminsky (1995) still consider the data to be reliable. The researchers found that the experimental group had significantly higher scores overall than the control group at the end of kindergarten. Additionally, the students who received phonological awareness instruction in kindergarten had an overall higher reading comprehension score at the end of first and fifth grade. Since the two groups had mixed levels of reading ability, Kozminsky and Kozminsky (1995) concluded that explicit phonological awareness instruction is crucial for struggling readers but also beneficial for readers of all abilities.

Al Otaiba (2008) and his team of researchers took a different approach to their research. They studied the implementation of a specific reading program called Reading First in seventeen kindergarten classrooms across eight other elementary schools in Florida. A total of two hundred eighty-six kindergarten students participated in the study. Reading First is a curriculum rooted in evidence based, systematic, and explicit methods. The team of researchers focused on two specific aspects of the Reading First program: phonological awareness and letter naming fluency (Al Otaiba et al., 2008).

The researchers completed observations of the teachers and reviewed data collected throughout the school year. Each of the seventeen kindergarten teachers was observed three times during the year: beginning, middle, and end to ensure that the program was being delivered effectively. The researchers also reviewed the data from the district's progress monitoring reports from the beginning, middle, and end of the school year and Dynamic Indicators of Basic Early Literacy Skills (DIBELS) data collected throughout the school year (Al Otaiba et al., 2008).

Over the course of the year, the average scores for both the letter naming fluency and phonological awareness assessments went up. At the beginning of the year, on average, students could name fourteen letters. By the end of the year, on average, students were able to name forty-two letters. This exceeded the grade level benchmark. Students began the year scoring just below grade level on phonological awareness tasks and by the end of the year, on average,

students were at grade level. The researchers concluded that when the kindergartners were exposed to evidence based, systematic, explicit methods of reading instruction that Reading First offered, they were able to make positive gains in both phonological awareness and letter naming fluency (Al Otaiba et al., 2008).

Bingham et al. (2010) used a method called Systematic and Engaging Early Literacy (SEEL) to study the literacy development of kindergarten students in their research. The SEEL method is a framework that combines explicit, sequential instruction alongside engaging activities to promote literacy development. The SEEL curriculum consists of skills such as phonological awareness, phonics, letter knowledge, and letter sound associations (Bingham et al., 2010). In this study there were sixty-three kindergarten students from five different classrooms and two paraeducators to provide the instruction. The kindergartners that participated in the study were those that had needs identified in their initial kindergarten screening and fell below the twentieth percentile. Of the sixty-three students, twenty-five were placed in a control group where they were given one-to-one instruction using a district endorsed non-SEEL curriculum called Reading One-to-One from a paraeducator three times a week for forty-five minutes. The remaining students in the study were instructed through the SEEL method from a paraeducator in a small group three times a week for thirty minutes. Both groups participated in the interventions for one academic year.

In the fall, at the beginning of the study, the children were assessed using a phonological awareness screener and an auditory blending assessment to gain baseline data of their skills. The students were then given the exact same assessments in the spring to measure their progress. After the data was compiled, they found that the group using the SEEL method outperformed the group using the non-SEEL method in the areas of rhyming, alliteration, letter knowledge, letter sounds, and spelling (Bingham et al., 2010). The findings from this study suggest that young children who struggle with literacy skills can make significant progress in their skills when given supplemental, explicit, and engaging instruction.

A two-year study was conducted to study the effects of phonological and word recognition intervention following the same group of students (Blachman et al., 1999). The study consisted of an eleven-week phonemic awareness program in kindergarten and was then followed by a reading program for the same students in first grade. Students were randomly allocated to a control or an experimental group. The control group of students participated in the school district's basal reading program while the experimental group was given explicit systematic instruction for the alphabetic code. In addition to the reading program, both groups were involved in the school's mandatory phonetic based spelling program (Blachman et al., 1999).

In kindergarten, one hundred-fifty-nine students participated in the study. Eighty-four students were placed in the experimental group and the remaining

seventy-five in the control group. Before the interventions began, the students were given an assessment to measure their starting place. Both groups of students participated in a total of forty-one lessons in the span of eleven weeks. At the end of the intervention period, the students in the experimental group had superior results in the areas of phonemic awareness, letter name and letter sound recognition, reading phonetic words, and spelling (Blachman et al., 1999).

In first grade, the participants totaled one hundred twenty-eight students. The number decreased because of a variety of reasons such as moving to a different school, excessive illness, or behavior issues. There were sixty-six students taking place in the experimental group and sixty-two in the control group from eleven different first grade classrooms. The experimental group was given explicit, sequential instruction in the areas of phoneme segmentation, letter name and sound recognition, and sequential phonemic spelling patterns. The experimental group took place in the explicit instruction in place of the district's basal reading program. At the end of the academic year, all the students in both groups were given a post-test measuring phoneme decoding skills, letter name and sound recognition, reading, and spelling. The students that were a part of the experimental group, again, significantly outperformed the students that were in the control group in all the areas that they were assessed (Blachman et al., 1999).

Elbro and Petersen (2004) conducted a long-term study to analyze the effects of phonemic awareness intervention and letter sound training for

students that were at risk of dyslexia because of family history. When the study began, the children were in kindergarten. Elbro & Petersen (2004) committed to continue their study of these same children until they were in seventh grade. Initially, the number of kindergartners that they started with was one hundred and thirty-six. At the conclusion of the study, the students that participated in the entirety of the research program totaled one hundred and twenty-three. The data from the study includes only the students that participated in the entirety of the study. Eighty-two of the students had an increased risk of dyslexia because at least one biological parent was diagnosed with dyslexia. The additional forty-one students were not identified as having an increased risk for dyslexia.

The teachers of the kindergarten students were trained in a systematic program to explicitly instruct phonemic awareness and letter sounds to students. This program was created by researchers and was influenced by the Lindamood Program. The teachers used this program with their whole class for thirty minutes during the day for a consecutive seventeen-week period (Elbro & Petersen, 2004). Pre-intervention assessment data was recorded in the areas of letter naming, word decoding, and a variety of phonemic awareness tasks were taken before the intervention period started to measure baseline data. At the end of the intervention, both groups of students showed a positive gain in the areas of letter naming, phonemic awareness, and decoding.

The researchers periodically gave the students in the study follow up assessments in second, third, and seventh grade. From these assessments, they

found that the students in both categories continued to make positive gains in their reading development even in those with the lowest reading skills. By the time that students were in seventh grade, positive results were found in both word reading skills and word fluency. Ultimately, Elbro and Petersen (2004) concluded that the systematic, explicit instruction these children were given in kindergarten helped to progress their reading development for years to come. They support the conclusion that improvements in phonemic awareness and letter sound intervention can be linked to positive reading development for students that are at risk of dyslexia (Elbro & Petersen, 2004).

A similar longitudinal study was completed to examine the effects of phonological training on kindergarten students who were at risk for dyslexia (Schneider, 1999). There were two groups of kindergarteners who participated in this study. One hundred ninety-one students were selected to be in the experimental group, and one hundred fifty-five students served as the control group. Within the experimental and control groups, three subgroups were created: children that were at risk, children who scored within the average range, and children who scored in the above average range. Before the study began, children were given an intelligence test and a pre-test of phonological skills. Students were allocated to groups based on their scores (Schneider, 1999).

The phonological training consisted of practicing the skills of alliteration, rhyming, phoneme segmenting and blending, phoneme deletion, and letter knowledge. The experimental student groups participated in the phonological

training for six months every day with the sessions lasting about fifteen to twenty minutes.

All the students in the control group made substantial gains from their pre to post-test after being exposed to the phonological training. The students in the at-risk group specifically made a large amount of progress. When their pretest scores were averaged, they scored five out of a possible forty points. Their post-test score was averaged to twenty-two out of a possible forty points. The students in the control group did make progress, but not nearly as much as the students that received the phonological training.

In first and second grade the same groups of students had their reading and spelling assessed. Schneider (1999) found the same trend as at the end of kindergarten. The students exposed to the phonological training in kindergarten scored higher in reading and spelling in both first and second grade. Though there were varying results from child to child, Schneider (1999) found that within especially the at-risk group of children, the phonological training program substantially helped the students in their phonological skills at the end of kindergarten as well as their reading and spelling ability in first and second grade.

A study was done to try and uncover a relationship between language and literacy skills (phonological awareness, alphabetics, letter writing, and word reading) and spelling in students by the end of kindergarten (Otaiba et al., 2010). The study consisted of two hundred and eighty-eight kindergarten students and

their corresponding twenty-nine teachers across nine different schools. All of the kindergarten classes completed a ninety-minute literacy block each day. Two curriculums were used between the classrooms: Reading Mastery and Imagine It. Both curriculums provided systematic and explicit instruction that focused the bulk of the instruction on phonological and phonemic awareness and decoding. Neither of the curriculums specifically targeted spelling instruction.

In the fall and spring, the kindergarten students were assessed in the areas of alphabetics, phonological and phonemic awareness, word reading, vocabulary, and spelling. At the beginning of the year, on average, students fell within the national norm in the categories of vocabulary and word reading. The students that scored in the at-risk percentile in the fall varied but overall improved their scores across all categories by the spring. Otaiba et al. (2010) contributed the systematic and explicit method of instruction to their success. Based on the fall and spring testing Otaiba et al. (2010) discovered that phonological awareness, alphabetic knowledge, and reading fluency were the largest reliable predictors of a student's spelling performance. By the end of the school year, the majority of the kindergarten students were meeting the national average in their language, literacy, and spelling performance. The team of researchers believe that phonemic awareness and the alphabetic principle that was being explicitly taught during their literacy blocks led to reading performance that was at the national average (Otaiba et al., 2010).

Systematic and Explicit Phonics Instruction

In addition to phonological awareness, another component of reading that need to be addressed for struggling readers is phonics. The following studies look deeply at the effects of direct phonics instruction's effect on struggling readers.

A study was completed on six kindergartners to help improve their word reading skills by giving supplemental phonics instruction (Noltemeyer et al., 2013). The six students were selected by their teachers because of their low reading skills. The kindergartners were randomly allocated to two groups. Each of the groups participated in the phonics instruction period and a control period. During the phonics instruction, students were taught letter names and sound correspondence. They were also instructed how to blend and segment the words to sound them out. Each lesson included focus words that had a similar phonics pattern (i.e., man, pan, can). The words were printed on a card, and the students read though them. The instructor would continue to have the students read through them until they had become automatic and fluent in reading the words. Each week students receiving the phonics intervention were given a pre-test to assess the words they could and could not read. The instructor would choose the focus words based on this assessment. The control group of students was not given instruction on the phonics pattern. The students were asked to read the words on the card (Noltemeyer et al., 2013).

The participants' response to the intervention were all positive; however, all six of the students varied in their degree of growth. The students also varied in their degree of retaining the material. Noltemeyer et al. (2013) hypothesized that this could have been because of the alternating treatment design of the study. Ultimately, the students were able to make the most gain in their word reading ability when they were explicitly taught phonics skills rather than when they were not getting the phonics instruction in the control group (Noltemeyer et al., 2013).

Ninety-three kindergartners, who were identified as needing additional support, participated in a study to determine the effect that systematic phonics instruction had on students (de Graaff et al., 2009). Students were randomly allocated to three groups. The first group received systematic phonics instruction while the second group's teacher took an indirect and non-systematic approach to teaching phonics. The third group was a control group that received no phonics instruction.

The first group learned to target only a few target sounds at a time, each sound was introduced in a pre-determined sequence. Students were taught the letter sound, given a visual correspondent, and practiced reading and spelling the sounds when put together to create a word. The second group explored phonics concepts as they arose in the texts they were reading. The instructor would still help them by providing the sounds that they needed to know but was not teaching them the sounds in a systematic way.

The kindergartners that participated in the study were given pre and post testing to measure their level of growth on measures such as word reading and spelling. The two groups receiving the systematic and non-systematic phonics instruction both scored higher than the control group on multiple measures. The group that received phonics instruction using the systematic approach scored statistically significantly higher than the students who received the non-systematic approach to phonics instruction on both the reading and the spelling post-tests. The conclusion was drawn that a systematic approach to phonics seems to yield a more positive approach than the non-systematic method. Additionally, the researchers drew the conclusion from the control group that phonics instruction is necessary for reading development (de Graaff et al., 2009).

Bradley and Noell (2018) completed a study on the effects of supplemental phonics instruction for struggling readers. In this study, they chose six first grade students from one school who were all performing below grade level. Prior to the study, all the kindergarten students were given curriculum-based measures in the areas of reading fluency, letter sounds, and word reading. Students were given specific post-tests in these same areas to assess their growth.

Each student received one-on-one interventions for the duration of the study. The intervention consisted of explicit phonics instruction used in conjunction with pseudowords. Pseudowords are “sets of letters whose phonological structure conforms to existing words but are not part of the English language” (Bradley & Noell, 2018, p. 883). Pseudowords were selected to ensure

that the participants were using phonics skills to sound the words out rather than relying on sight-reading skills. Every student started by only learning consonants and short vowels. As they showed mastery of the concepts, they were taught more complex phonics skills such as blends and digraphs (Bradley & Noell, 2018).

Upon post-testing, the kindergarten students made the most growth in letter sounds and word reading. Students made the smallest gain in their reading fluency. From this data, Bradley and Noell (2018) were able to conclude that supplemental explicit phonics instruction was effective in helping struggling readers build their letter sound knowledge and single word reading ability.

A longitudinal study was done to determine the effectiveness of direct phonics instruction to simulate word reading skills. Lie (1991) led this study using two hundred and eight first grade students that were identified as struggling readers. The students were randomly allocated to one of three groups. The first group's focus was on identifying the first, middle, and end sounds in the word to help the students read effectively. The second group focused on blending and segmenting the words and progressively adding on more advanced phonemes to known base words. The third group was a control group that participated in neutral literacy activities that were already happening in the classroom. This group of students participated in this study from the beginning of first grade until the end of second grade.

At the beginning and end of each academic year, the students were given an assessment to measure their progress in reading and spelling. After the data was compiled, Lie (1991) found that the students in the group focusing on specific phonics concepts scored higher than in the control group on reading and spelling assessments. This was true for the assessments at the end of first grade and second grade. At the end of second grade, the students in the group primarily focused on blending and segmenting words had a larger amount of growth than the students focused on identifying the first, middle, and end sounds. Lie (1991) did not find a statistically significant difference between the scores of students in the two different phonics groups. He could not conclude that one method of phonics instruction was superior to another in stimulating word reading skills (Lie, 1991). He was, however, able to conclude that when students were intentionally given phonics instruction, they outperformed students that were not intentionally given phonics instruction.

Schaars et al. (2017) studied the early word decoding development when exposed to phonics instruction for children at risk of dyslexia. The students that were chosen for this study had at least one biological parent with dyslexia and were underperforming in reading. The researchers also included a control group of students that were not at risk for dyslexia to measure progress. There were seventy-three students in the at risk group and control groups, a total of one hundred forty-six. The children participating in the study were in first grade and had an average age of six years old. Students were given assessments before

starting the systematic phonics-based reading curriculum, during the first-grade school year, and at the end of the year.

Both groups received a daily phonics lesson delivered by their classroom teacher. The classroom teachers used a reading curriculum called Learning to Read Safely. This systematic phonics curriculum focused on introducing material in a sequential manner that built on the previous phonics concepts. Over the course of the year, the students were given systematic, explicit instruction on phonemes, graphemes, and phonics rules so that they could develop the skills to be able to read and spell words successfully (Schaars et al., 2017).

On the initial assessment, the students that were at risk for having dyslexia scored significantly lower than the control group that was not at risk for dyslexia. Throughout the school year, both groups of students grew in their ability to decode words. The control group scored higher than the at-risk group on the final assessment. The discrepancy between the two groups remained constant. Schaars et al. (2017) concluded that the explicit, systematic phonics instruction was an effective method for both children who are and are not at risk for dyslexia to increase word reading ability.

Dahl and their team of researchers completed an in-depth study of phonics instruction to study the effects of phonics instruction on first grade students' reading (Dahl et al., 1999). The team of researchers studied specifically what the teachers were teaching, when the instruction occurred, and the achievement of

the students receiving the instruction. The study used nine different first grade classroom teachers across eight elementary schools.

At the beginning of the study, all the students were assessed on their ability to encode in context, decode in context, encode in isolation, and decode in isolation. Students were placed in three groups based on their pre-test score: grade one, pre-primer, and below pre-primer. After the assessments were scored, the teachers began their phonics instruction. The phonics lessons consisted of phonological awareness, letter names and sounds, and phonics patterns and rules. All students in the classroom were exposed to the phonics lessons regardless of their reading ability because it was done during their literacy block in class.

At the end of the first-grade year students were given the same test at the beginning of the school year. Overall, all of the students made gains in their ability to decode and encode words. The students who started the year testing at a first-grade level, on average, were decoding words at a fifth grade level and the students who scored at the pre-primer level were decoding at a first grade level by the end of the year. The students who scored at the lowest level (below pre-primer) were, on average, decoding words at the pre-primer level (Dahl et al., 1999).

Klages et al. (2020) intended to identify students' literacy growth over one school year using a structured literacy program rooted in the Science of Reading called Connections: OG in 3D. Connections: OG in 3D is a structured literacy

program that provides explicit instruction in the five components of reading. All of the lessons are cumulative and taught in a systematic order using multisensory principles. Students have access to tangible 3D items to help them make the connection to sounds. For example, to teach the short a sound, the teachers would bring in a real apple for the students to help them connect the sound with the object (Klages et al., 2020). The students that participated in the study came from four schools in Arkansas and ranged in grades from first, third, fourth, and eighth grade. Students that were identified as having characteristics of dyslexia were pulled out for intervention three times a week for forty-five minutes at a time.

The team of researchers used a quasi-experimental design for their study. There was not a control group of students that exhibited characteristics of dyslexia but would not receive intervention because of the unethical nature of that design of the study. Once students were identified as having characteristics of dyslexia, they were given a pre-test (DIBELS) to measure baseline data. Throughout the intervention program, they were given progress monitoring tests. The researchers used the pre-test and post-test data to analyze the students' growth as they were participating in the intervention.

As of December of 2019, all the students in the intervention groups using Connections: OG in 3D exhibited double digit growth across all five areas of reading. Not a single student regressed or remained stagnant in their growth throughout the program. It was at this point in the study the team of researchers decided to complete their formal write up. They are continuing to collect

research from these schools via continued post-testing. Klages et al. (2020) concluded that a structured literacy program that is rooted in the Science of Reading, is effective at any grade level to help students that have characteristics of dyslexia learn to read.

In an independent study, Cordell (2009) conducted a research study to determine the benefits of phonics instruction to help struggling readers learn to read. Her study involved thirteen first grade students who received direct phonics instruction. The students were provided instruction through a curriculum called Open Court phonics instruction. The Open Court phonics program uses explicit phonics instruction to teach students how to read and spell phonics patterns in a systematic way.

The students were given this instruction in small groups. Prior to the intervention, students were given a pre-test using DIBELS to assess their nonsense word fluency, phoneme segmentation, letter recognition, sound recognition, and oral reading fluency (Cordell, 2009). From the pre-test data, individualized phonics interventions were created. The thirteen students were divided up into small groups and were provided with intervention three times a week for twenty minutes. The primary focus of the interventions was to improve sound-letter recognition, spelling of learned phonics patterns, blending one and two syllable words, and fluency (Cordell, 2009).

Students were given monthly assessments throughout the academic year to assess their progression. At the end of their first-grade year, students were given

a formal post-test to measure their progress. The post-test showed that many of the students grew in all areas; however, the students collectively grew the most from their pre to post test in the category of nonsense word fluency. This was significant to Cordell (2009) because in order to read nonsense words, the students must have a strong knowledge of letter-sound correspondence as well as phonics patterns and rules. Cordell (2009) concluded that the phonics intervention was successful in helping her struggling readers acquire the skills to read.

Eighteen first graders participated in an independent study to determine the effectiveness of an explicit, systematic phonics program called Saxon Phonics (White, 2017). Saxon Phonics is designed to be used as a supplement to a reading curriculum rather than a replacement. The areas that White (2017) was investigating to see if there was a correlation were comprehension, vocabulary, and word recognition. Students were initially evaluated in March and again in May using a two district measures, the STAR Early Literacy Test and the Basic Literacy Test, to measure the effectiveness of the program.

Students were given instruction from the Saxon Phonics program every day. The program teaches phonics skills in a cumulative and systematic way. Each day students would review the phonics patterns that they had been previously taught and they would have the opportunity to practice. When the students were ready, new material would be introduced in the lesson as well.

After the data was collected, White (2017) found that the Saxon Phonics program had a positively affected on several areas for the students involved in the study. First, the explicit, systematic phonics program had a positive impact on the student's reading comprehension. This was measured using the two district assessments. Second, the students word recognition and vocabulary skills both increased as measured by the students' scores on the March and May STAR Literacy assessments (White, 2017). .

A recent study was compared the effects of word reading instruction paired with word meaning instruction compared to only word reading instruction. This study is driven by the connectionist movement. The connectionist movement believes that word reading accuracy and proficiency are possible when three parts of instruction are present: phonological (pronunciation), orthographic (spelling), and semantic (meaning) (Austin et al., 2022). The study consisted of twenty-two students who had to meet a strict criterion to participate in the study. Participants had to be in either fourth or fifth grade, score below the fortieth percentile on an initial placement test, and score below fifty percent of the word meaning pre-test. All the participants in the study were given both methods of instruction. Each participant was given one-to-one sessions for forty-five minutes daily for twelve consecutive days. The word meaning plus word reading sessions had a different set of target words than the word reading only instructional settings. In both methods of instruction, the students were taught the target phonics skills that they would need to properly decode the words. The

only difference between the sessions was that in the word meaning plus word reading sessions, the students were also explicitly taught the definition of the word using words and a picture on a card. Students were given a pre-test before beginning instruction and given a post-test immediately after finishing instruction to measure their progress.

Austin and their team of researchers found that there was a statistically significant level of increase in word reading after both intervention methods were completed. Additionally, they found that when students received the word reading instruction paired with the word meaning instruction, their scores on the post-test were higher overall when compared to the students who received only the word reading instruction. “The present findings suggest that reading word plus word meaning instruction may be a beneficial approach for supporting word reading for dyslexic readers who frequently do not make meaningful, long-term gains in accuracy and fluency from word reading instruction alone” (Austin et al., 2022, p. 217).

Schmidgall and Joseph (2007) completed a study to compare the effects of two word reading methods. The researchers identified six first grade students who were identified as having a deficit in reading. The first method in their study was a phonics-based method. The second method they called the traditional drill and practice method.

Each student was given an initial assessment. They were asked to read a list of one hundred words. The words were sorted into known and unknown words

based on the student's correct or incorrect response. The interventions were individualized for each child based on their initial assessment. Over a period of twenty days, students were given both methods of instruction. Their response time to reading words was tracked. For each session, the student was presented with six unknown words from their initial assessment. The researchers used this data to measure the effect of each of the methods.

When students were given the phonics-based method the teacher used sound boxes and taught each of the sounds to the students. If there was a phonics rule involved with an unknown word, the teacher would also include that in their lesson. After the word was mapped out, the teacher would ask the student to read the word. During the traditional drill and practice method, the instructor would present the six unknown words one by one by reading them out loud and having the student repeat them. The teacher had the student repeat the words and would give corrective feedback as needed (Schmidgall & Joseph, 2007).

After the twenty days of intervention, the data was compiled and analyzed. Since the sample size was small, the results varied. All of the students grew in their ability to read the words presented to them. There was not a great enough difference in word reading response time between the two methods to determine if one was more effective than the other. However, Schmidgall and Joseph (2007) found that the students retained the words for a longer period of time when they learned the words using the phonics-based method.

In 2016, a team of researchers completed a study to understand the effects of phonological and phonics reading instruction for children with a reading disability (Steacy et al., 2016). The study was comprised of thirty-seven children in grades three through six that were identified as having a reading disability and were receiving special education services. In total, the children received sixty lessons over the course of the study. The interventions occurred two times a week for one hour and thirty minutes.

The students were divided into two groups so that two different curriculums could be assessed. The first group of children were instructed using the Phonological and Strategy Training (PHAST). The second group received instruction via the Phonics for Reading curriculum. Both programs require explicit phonics instruction. The PHAST program focuses on phonological awareness, grapheme-phoneme correspondence, and word identification processes to help decoding. The Phonics for Reading program's focus is on phonological awareness and teaching children phonics patterns and rules in a systematic manner.

Prior to starting the interventions, all the students were assessed on their phonological awareness, rapid automatic naming, word identification and attack, sight words, phonemic decoding, and vocabulary to collect baseline data to compare their end results (Steacy et al., 2016). Post test data revealed that there was a significant increase in word reading skills shown by both groups. Neither group progressed significantly more than the other, so the researchers

determined that both phonics curriculums were effective in increasing word reading skills in students with reading disabilities.

An Italian researcher, Tressoldi, conducted a study centered around finding a method to help improve the decoding and fluency of students with dyslexia. Tressoldi selected and developed an orthographic strategy called the subsyllabic method delivered via a computer program. This method “was aimed at automatizing the recognition of syllables within words in connected texts” (Tressoldi, 2007, p. 203). The method broke down words in isolation into their syllable parts. Then students were asked to read these words embedded in texts.

A total of sixty-three students from second to eighth grade diagnosed with dyslexia took place in one of the two versions of the subsyllabic method: self-paced and automatic. The self-paced version allowed the students to move through the computer program at their own pace. The automatic version meant the program had a fixed pace for the student. Upon entry into the study, the students were given a pre-test and a post-test when they completed the study to measure their progress (Tressoldi, 2007). After the students were already allocated to their groups, Tressoldi found that the pre-test scores of the automatic group were higher than those of the self-paced group. He did not choose to re-randomize the groups.

After three months, the students were given a post-test to assess the student’s progress. Both groups did increase their fluency however, Tressoldi found that the group receiving the automatic version of the subsyllabic method

had a higher fluency score than those that did the self-paced version of the method. He hypothesized that the result was because of two factors within the study. First, the automatic group initially scored higher on the pre-test. Second, the automatic group, because of the set pace of the program, was able to get through more of the program's content (Tressoldi, 2007). Despite these two factors, Tressoldi made the conclusion that instructing students on the syllable types in isolation and connected text and presenting this instruction at a rapid and automatic rate helps with decoding and may be crucial to improving student's fluency at a quicker rate (Tressoldi, 2007).

It is important to note that a program or curriculum that labels itself with the terms of explicit, sequential phonics instruction or multisensory instruction does not mean that is evaluated for efficacy in helping students with reading struggles using research-based practices. Hall et al. (2020) studied the similarities and differences of two different reading intervention programs designed for elementary aged students that were identified as having dyslexia. The two programs were The Multisensory Teaching Approach and Reading Rules. The team of researchers compared the two programs by how much time was dedicated to components of the program (i.e., letter name knowledge, phonological awareness, fluency, comprehension, and vocabulary) and how much of the lesson was characterized by explicit methods of instruction.

Four teachers volunteered to be a part of the study; two would teach the Reading Rules program and two teachers would use the Multisensory Teaching

Approach. The teachers saw students ranging from second to fourth grade in groups ranging from one to six.

Hall et al. (2020) conducted three, forty-five minute observations of each teacher. In each observation a researcher kept track of what activity was happening for the majority of each minute, what type of instruction was being given, and what materials were being used. They coded each data point using a created resource called the Snapshot of Dyslexia Instruction Instrument.

After compiling their data points, they were able to conclude that both programs used explicit, systematic, and sequential instruction. In addition, both programs used essentially the same amount of time focused on decoding and encoding instruction. However, the Multisensory Teaching Approach spent significantly more time teaching orthographic rules in relation to decoding and encoding than the Reading Rules curriculum did. The researchers also concluded that Reading Rules had more multisensory approaches while the students were decoding and encoding than the Multisensory Teaching Approach did. In all, the researchers did not make a conclusion on the effectiveness of one program over the, other, rather they highlighted the strengths and potential weaknesses of each program. They also wanted to caution their readers to always take a closer look at programs that claim to be multisensory. Hall et al. (2022) acknowledged that this is a topic that receiving an increased amount of attention from school districts and legislature. They encourage schools to really investigate the type of multisensory instruction that is advertised by commercial reading programs advertised to help students with dyslexia.

Comparing Direct Versus Indirect Methods of Instruction

There are two methods of reading instruction that are widely used in classrooms today. The first method is characterized by its explicit and systematic teaching of phonics. This method uses sound-symbol correspondence and eventually leads to comprehension mastery. This type of reading instruction is endorsed by the body of research making up the Science of Reading. The second method is commonly referred to as a Whole Language or Balanced Literacy approach. Balanced Literacy generally takes an indirect approach to language instruction. This approach has students memorize whole words and use other words contextually to read the word (Robinson, 2018).

Robinson (2018) conducted a study that looked at the effects of these two reading curriculums on English Language Learners (ELL) who were struggling to read. There were one hundred ten students from first and second grade from an international school that participated in the study. Students were given pre and post-test assessments to measure their development throughout the study. The students were placed into three different groups. Group one was given an intensive phonics-based reading program for at least twenty minutes during their forty-five-minute literacy block. For the remaining time, students worked on writing and language skills. Group two used a whole language program exclusively. During their forty-five-minute language block, students would listen to a story read aloud by the teacher and have independent work time for reading and writing. Group three also received a phonics-based program. Rather than

twenty minutes a day, they received the instruction for thirty minutes. When given the post-test, students in group three scored the highest followed by group one. The ELL students who were given phonics-based instruction during their literacy block scored significantly higher than the students that received the whole language approach (Robinson, 2018).

Xue and Meisels (2004) conducted a large study that included thirteen thousand six hundred nine kindergarten children in two thousand six hundred ninety classrooms across seven hundred eighty-eight schools. Their research included looking at different early literacy instructional approaches within the kindergarten classrooms. Data was collected from the kindergarten teachers in the fall and in the spring. Xue and Meisels (2004) also plan to continue this study and will collect data from these same children in the fall and spring of first, third, and fifth grades.

The researchers chose three methods to measure student's progress and track the method of instruction. First, they used a cognitive test specifically focusing on the language and literacy scores. Second, they asked the teachers to use an informal rating scale to measure the children's skills. Additionally, the teachers were surveyed about how much time they spent during the week on language instruction and what type of instruction was happening during their language arts instruction time.

Of the teacher survey the two most common methods of literacy instruction were a systematic, explicit, phonics-based instruction integrated into their

literacy instruction and whole language approach (Balanced Literacy). Though both methods of instruction yielded positive results, Xue and Meisels (2004) were able to make the correlation that the teachers who reported more time spent on explicit phonics instruction had students who were scoring higher on the cognitive testing.

Connelly et al. (2001) compared two groups of beginning readers response to two different methods of reading instruction. The first group was taught to read by a “book experience,” a non-phonics approach, and the other group was taught to read using an explicit phonics approach. The researchers compared the success of the two programs based on the student’s ending progress based on their reading comprehension and word recognition.

The first group of students was provided a non-phonics based instructional method that the researchers called the “book experience” that used leveled books to promote reading development and comprehension. This method focused less on word reading and more on engaging students in the story. Teachers asked students to use pictures or words in context to figure out what an unknown word was. During small group instruction, students were given a book that had a level associated with it. The books contained words that were repeated over and over so that the reader would become familiar with them as they read. After, the students read through the book with their teacher. They would answer comprehension and vocabulary questions from the text (Connelly, et al., 2001).

The second group of students was given explicit, systematic phonics instruction during reading instruction. The teacher would begin the lesson by introducing or reviewing the target phonics sounds and rules. The students would then read and write words containing the patterns and sounds. The teacher had pre-selected phonics worksheets and texts that contained phonics patterns that the students had learned to check for comprehension (Connelly et al., 2001).

The students in both groups were given a series of assessments at the beginning of the year and at the end to measure progress in the areas of phonological awareness, word reading accuracy and rate, and comprehension. The children that were taught using explicit, systematic phonics instruction scored higher in the areas of phonological awareness, word recognition accuracy and comprehension. Children that were taught using the “book experience” methods scored higher in word reading rate. Connelly et al. (2001) concluded that the children who received the phonics instruction have a greater proficiency in overall reading development in comparison to the children who received a non-phonics approach.

In 2014, Duff and their team of researchers conducted a study to compare the longitudinal effects of different structures of intervention. Students that participated in the study were randomly allocated to either a full eighteen weeks of individual or small group intervention (experimental), and the other students stayed in the classroom for nine weeks and then followed up with nine weeks of

individual or small group interventions (control group). All the students that were selected for this study were identified as having a family history of dyslexia and scored in the low range of a word reading pre-test (Duff et al., 2014). There were seventy-seven children that were a part of the experimental group and sixty-eight children that were a part of the control group.

Students were given an initial inventory to test their phonemic awareness, spelling, vocabulary, and listening comprehension. Duff and the additional researchers developed their own reading intervention program for this study. The created program is called Reading and Language Intervention. They describe the Reading and Language Program as using evidence-based practices that integrate phonological awareness and reading. The language component of the intervention focuses on vocabulary and used books to highlight themes and text structure (Duff et al., 2014). Students in the experimental group participated in daily individual phonemic awareness and reading for twenty minutes. Students participated in small group lessons daily for thirty minutes to focus on the language component of the program.

After both groups finished the eighteen weeks of the study, the researchers compiled the assessment data. They found that both groups made language and literacy progress; however, the students in the experimental group showed a greater amount of progress when given intervention for the full eighteen weeks. The progress reported was minimal. The researchers ultimately concluded that the method of teaching was not the problem but rather the time frame that they

ran the study for. They believe that they would have seen more growth in both groups had the interventions lasted for longer periods of time (Duff et al., 2014).

Romero (2020) sought to answer the question: “Does a multisensory approach help to decrease the learning struggle when learning to read?” His study was done in the specific context of struggling readers learning English as a second language. His study centered around a small focus group of ten students ranging from ninth to tenth grade attending a public high school in Monteria, Colombia. The students were selected based on their lack of academic progress and their willingness to learn English. The ten students were identified as struggling academically and had an unwillingness to learn English in the general education setting where they were using a whole language approach to teaching reading. The study designed five multisensory activities to help their language development over two academic terms. The activities focused on the following skills: vocabulary, phonology, and grammar. Some of the activities included students saying the sounds of the word, repeating the correct pronunciation of a word, and describing pictures using verbs in the correct tense that they had learned.

Students that participated in the study were initially observed and interviewed about their language skills. After a few weeks of multisensory intervention, students were given a reading comprehension test and vocabulary exam. At the end of the study, the teachers and students were interviewed about the perceived change in academic success. The students’ academic progress

was also monitored via their report cards. All the students' academic scores went up after they finished the multisensory intervention period. Additionally, nine out of the ten students reported that they enjoyed learning English and had a desire to learn the language. This suggests two things. First, a multisensory approach works with students who struggle to learn the English language. Second, it suggests that when students are able to be successful using the multisensory method students, they have a positive response to learning (Romero, 2020).

In a private study done through The University of Mississippi, Parmer et al. (1997) examined the effects of an integrated format of reading instruction for students who exhibited severe reading difficulties. The team of researchers used one hundred twenty-three fourth and fifth grade students from a local public school who were identified as being at least one year below grade level in reading. The students were randomly allocated to the experimental group or the control group. All students were given five assessment measures prior to the study beginning so that their reading progress could be measured.

The students who were in the experimental group received what Parmer et al. (1997) called integrated reading instruction. This method of instruction was comprised of explicit and systematic teaching of phonics, word recognition strategies, and sight words. Students were given integrated reading instruction daily for fifty minutes in small groups during their literacy time. The students in the control group received the instruction that was happening in the general

education classroom. They received the general instruction as a whole class daily for fifty minutes three days a week and met as small groups for two days a week.

At the end of the ten weeks of the study, the students took the same assessments to measure their reading development growth. The scores on the word recognition tests did not yield statistically significant results between the group. Therefore the team of researchers could not conclude that one method was more effective to increase word recognition in struggling readers. However, the students in the experimental group grew a substantial amount in their reading comprehension compared to the control group as measured by the pre and post testing (Parmer et al., 1997).

CHAPTER III: DISCUSSION AND SUMMARY

Summary of Literature

The body of research behind the Science of Reading consists of a wide variety of topics dealing with how reading instruction should be delivered. For the purpose of this research paper, the focus was on the specific areas within the Science of Reading that are known to help students that are struggling to learn to read. Those areas are systematic and explicit phonological awareness and systematic and explicit phonics instruction. Finally, specific studies that compared explicit and systematic methods of reading instruction to non-explicit and systematic methods of reading instruction were selected.

Phonological awareness is among the first skills a child needs to acquire in order to be able to read. Skills within the broad category of phonological awareness include the following: rhyming, syllabication, blending and segmenting phonemes, as well as phoneme deletion and substitution. Many studies also covered the importance of explicitly teaching letter names and sound correspondence in tandem with phonological awareness instruction (Al Otaiba et al., 2008; Clayton et al., 2020; Elbro & Petersen, 2004; Otaiba et al., 2010). When young students were given explicit and systematic instruction in the area of phonological awareness, across the studies, the children's scores increased when their pre-test and post-test data were analyzed (Bingham, Hall-Kenyon, & Culatta, 2010; Blachman et al., 1999; Boyer & Ehri, 2011; Kozminsky & Kozminsky,1995; Schneider, 1999; Tressoldi, 2007). When observing these studies together, they suggest that when a student who is struggling to learn to

read is given systematic and explicit phonological awareness instruction, they can make significant progress in their skills.

From the research, the conclusion can be drawn that struggling readers also benefit from systematic and explicit phonics instruction. Hall and their team of researchers studied the elements that should be in place for a program to be categorized as explicit, systematic, and multisensory (Hall et al., 2020). The elements they were specifically looking for were explicit methods of instruction in letter name and sound knowledge, phonological awareness, fluency, comprehension, and vocabulary. In many studies, the researchers studied the effects of struggling readers before and after they were given supplemental explicit phonics instruction in order to prove the benefit of this method of instruction (Austin et al., 2022; Bradley & Noell, 2018; Cordell, 2009; de Graaff et al., 2009; Noltemeyer et al., 2013; Lie, 1991; Schmidgall & Joseph, 2007; Steacy et al., 2016; White, 2017). Other researchers conducted a study where all students participated in the direct phonics instruction (Dahl et al., 1999; Klages et al., 2020; Schaars et al., 2017). The researchers saw growth in all studies examining the effects of systematic and explicit phonics instruction, specifically in word reading skills. A few studies that had a smaller sample size that did not see as much growth in the children's ability to read on their post-test (Noltemeyer et al., 2013; Schmidgall & Joseph, 2007).

Generally speaking, there are two methods of reading instruction in schools today. They can be categorized into explicit, evidence-based instruction and non-explicit, Balanced Literacy methods of instruction (Robinson, 2018; Xue

and Meisels, 2004). Because of the differences between the two methods, researchers studied the two methods to gain a better understanding of the effects on student reading proficiency. The researchers split the group of students up. One group would receive the explicit reading instruction while the other group would receive the non-explicit reading instruction approach. Most of the studies found that the students receiving the explicit reading instruction scored higher on their post-testing (Connelly, Johnston, & Thompson, 2001; Duff et al., 2014; Parmer et al., 1997; Robinson, 2018; Romero, 2020). Xue and Meisels (2004) studied the two methods of instruction in relation to the end of year test scores. They found that both methods of instruction did yield positive growth. However, the students that received explicit instruction scored higher overall. Parmer and their team of researchers were not able to provide statistically significant results to determine the effectiveness between the two methods of instruction due to their sample size and duration of study (Parmer et al., 1997).

Limitations of the Research

The topic of reading is widespread and complex. For the purpose of my research, it was limited to the areas of reading that are typically impaired in an individual with reading difficulties: phonological awareness and phonics acquisition. Both phonological awareness and phonics acquisition are the building blocks for more complex reading skills. Effective methods for teaching more complex skills such as fluency, comprehension, or vocabulary were not studied. An entire separate research paper could be written on each of these topics because of the amount of research surrounding them.

Another limitation of my research was that the actual terminology of the Science of Reading is not being widely used in educational databases yet. Because of this, I used the principles and terminology within the Science of Reading to guide my research.

Implications for Future Research

Though phonemic awareness and phonics instruction does help to improve fluency and comprehension, the next steps in the research could include exploring the topics of effective methods of teaching fluency, comprehension, and vocabulary (Connelly et al., 2001; Cordell, 2009; Kozminsky & Kozminsky, 1995). This would give the reader a full picture of effective methods to teach across all aspects of reading instruction. Once an individual with reading difficulties has mastered their phonological awareness and has a solid base of phonics knowledge, they will be ready to develop the other necessary skills to read effectively and for meaning.

Implications for Professional Application

When doing my own interventions with struggling readers, I want to make sure that the time that I am pulling out of class is going to be valuable to their reading development. I want to make sure that I am providing my students with the best instruction possible so that they are master the concepts and moving toward grade-level standards. I was initially introduced to the systematic framework and explicit instructional methods of reading instruction when I was trained in Orton Gillingham. After seeing the drastic and positive effect that the instruction had on students with reading difficulties, it ignited a passion in me to

teach reading in this way to as many students as I encountered. I saw such high levels of growth in my students over the course of the first year that I was teaching using the Orton Gillingham methods. Prior to learning about using systematic and explicit methods of instruction, I was using a balanced literacy approach like my undergraduate university had taught me to do.

Last year, our administration tasked a few teachers to help choose a new reading curriculum for elementary students. I was fortunate enough to be a part of the selection committee. We looked at a wide variety of curriculums. In the end, we chose a reading curriculum rooted in the Science of Reading. I wanted to dive deeper in my understanding of how this method of instruction affected struggling readers. I also wanted to become more knowledgeable about this topic so that I could support my colleagues and instill confidence in the parents of my students who are struggling readers. With confidence, I want to be able to tell them that the instruction that their child is receiving in the classroom will address their needs in addition to the interventions that I am doing with their child.

The Science of Reading is slowly being integrated into schools across the country. Multiple states have passed legislation surrounding the training of teachers and necessary curriculum to ensure that evidence-based methods are being used to teach students to read. I feel a strong responsibility as an educator to be a lifelong learner for the best interest of my students. I wanted to have a broader understanding of what methods within the Science of Reading would be helpful to students who have difficulty reading.

After spending time studying the research, I feel confident in the body of scientifically based research behind the Science of Reading. I believe that the methods of instruction used to teach phonological awareness and phonics are effective in helping students that struggle to read both in the general education classroom and for reading intervention.

Conclusion

The principles within the Science of Reading include the explicit and systematic instruction of phonological awareness and phonics instruction. The purpose of this paper was to explore the effects of these methods on students with reading difficulty. Given the research surrounding these topics, it can be concluded that the explicit and systematic principles of instruction found within the Science of Reading are effective in helping struggling readers acquire the foundational skills to read effectively. Finally, the explicit and systematic methods of instruction were compared against non-explicit and systematic methods of instruction. The majority of the studies that compared the two methods found that students were more successful when given the explicit and systematic nature of instruction.

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