THE EFFECTIVENESS OF THE SCOTT FORESMAN EARLY READING INTERVENTION PROGRAM ON IMPROVEMENT OF PHONEMIC AWARENESS AND DECODING SKILLS FOR A SAMPLE OF AT-RISK KINDERGARTEN STUDENTS

DISSENTATION

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By

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ABSTRACT

The current study examined the efficacy of direct, small-group instruction in phonemic awareness and letter-sound recognition for pre-reading kindergartners who have been identified as possessing poor phonemic awareness. Subjects selected for this study consisted of nine kindergarten students from a suburban elementary school who were identified as deficient in phonemic awareness skills as measured by their performance on the Dynamic Indicators of Basic Early Literacy Skills (DIBELS). The intervention utilized was the Scott-Foresman Early Reading Intervention Program. Participants in this study received three half-hour sessions of intervention per week for either eight, ten, or twelve weeks. The effects of the Scott-Foresman Reading Intervention Program were measured by a multiple baseline across subjects design on the DIBELS, as well as pre- and post-test comparison of standard scores of the Letter-Word Recognition Test within the Woodcock-Johnson Psycho-Educational Battery, Third Revision. Results show that the Scott Foresman Reading Intervention Program positively influenced the attainment of critical reading benchmarks as defined by the DIBELS subtests of Phoneme Segmentation Fluency and Nonsense Word Fluency. Students who participated in the above intervention also made statistically significant gains in letter and word recognition as measured by the WJ-III. The above findings support the efficacy of highly explicit, direct, small-
group instruction in phonemic awareness and letter-sound recognition as components of an early reading intervention program.
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CHAPTER 1

INTRODUCTION

Background

Overall, national longitudinal studies show that more than 17.5 percent of the nation’s children, about 10 million children, will encounter reading problems in the crucial first three years of their schooling (NICHHD, 2000). There is little debate over the long-term consequences of being a poor reader. Being an at-risk reader affects school-performance, self-confidence, and can have a significant impact on a child’s life trajectory, as poor reading skills significantly limit one’s access to information. Poor reading achievement has been correlated with a number of social problems including delinquency, teen pregnancy, high school dropout, unemployment, and homelessness (McGill-Franzen, 1987).

While there are many definitions of the at-risk reader, research indicates that students in the bottom 25% of the reading continuum have a trajectory of progress that diverges early from their peers who have learned to read successfully (NICHHD, 2000). Hettleman (2003) uses the term “invisible dyslexics” to refer to children whose futures are destined for the types of problems above because their difficulties
in learning to read are either identified too late, treated too little, or not identified or treated at all.

It appears evident that the first step in addressing the needs of students identified as “at-risk” is early intervention or prevention. Given the outcomes of students who are identified as poor readers at the end of first grade, it is sufficient to assume that time is of the essence. There is no good evidence that children who are not making adequate progress in reading in kindergarten and first grade are not developmentally ready to learn to read, and will, in time, be ready to read. On the contrary, research suggests that we as educators have a “window of opportunity” that begins to close as a child finishes first grade (McCormick, 1999) For this reason, schools must allocate more resources to strategies which are directed at preschool and early primary grades. Waiting until a child is a year behind is too late.

If the mechanisms by which students become poor readers are known and can be ameliorated, then early reading failure is fundamentally preventable. Stanovich (1986) suggests that prevention and amelioration of the serious reading problems should be undertaken through 1) early identification and remediation of serious phonemic awareness in beginning readers and 2) large amounts of extended practice of connected text reading. The incorporation of these elements into a reading program is an effort to counteract the factors that push students toward the trajectory of a poor reader.

**Statement of the Problem**

The proposed study focuses on the first tenet of Stanovich’s proposal. The reason for this focus is the fact that phonemic awareness is a necessary prerequisite
for meaningful practice with connected text. Poor phonemic awareness leads to poor word recognition strategies, and thus less practice reading connected text (McCormick, 1999). Also, while most teachers are experienced in providing experiences with books, many will admit that they are less proficient in the explicit instruction of phonemic awareness.

Currently, there is much research to support the need for the early identification and remediation of children at-risk for reading failure. What is less researched are the outcomes of early reading intervention programs which 1) focus on key early literacy skills such as phonemic awareness, letter-sound recognition, and beginning decoding skills, 2) utilizes highly explicit instruction to teach these skills and 3) use continuous assessment to monitor progress and make decisions about intervention effectiveness. The combination of the Scott Foresman Early Reading Intervention Program and the Dynamic Indicators of Basic Early Literacy Skills is one such combination.

Purpose of the Study

The purpose of the current study is to determine whether direct, small-group instruction in phonemic awareness, letter-sound recognition, and beginning decoding skills for pre-reading kindergartners who have been identified as possessing poor phonemic awareness will positively influence the attainment of critical benchmarks of early literacy skills, and, in turn, turn potential poor readers into good readers.
Research Questions

The implementation of this study is guided by the following questions.

1. Will students improve their phonemic awareness skills as measured by DIBELS Phoneme Segmentation Fluency Test as a function of participation in the Scott Foresman Early Reading Intervention Program?
2. Will students reach a specified benchmark of phonemic awareness as measured by DIBELS Phoneme Segmentation Fluency Test as a function of participation in the Scott Foresman Early Intervention Program?
3. Will students improve their beginning decoding skills as measured by DIBELS Nonsense Word Fluency as a function of participation in the Scott Foresman Early Reading Intervention Program?
4. Will students reach a specified benchmark of early reading decoding skills as measured by DIBELS Nonsense Word Fluency as a function of participation in the Scott Foresman Early Reading Intervention Program?
5. Will students make significant gains in word reading and letter identification as measured by the Woodcock-Johnson Psycho-Educational Battery Letter/Word Identification Test as a function of participation in the Scott Foresman Early Reading Intervention Program?

Significance of the Study

This study is unique in that it attempts to analyze the Scott Foresman Early Reading Intervention Program. This newly published program is based on Project Optimize, a five-year longitudinal research study. While the basic instructional premises of Project Optimize have been included in the Scott Foresman Early...
Reading Intervention Program, this program itself was just released during the current school year, and therefore has not been researched. Another unique feature of the study is the use of the Dynamic Indicators of Basic Early Literacy Skills to measure progress. This combination of direct instruction of pre-reading skills and continuous monitoring of student progress to drive instruction is predicted to be a recipe for successful reading outcomes for at-risk readers. This study is also unique in that many of the other studies involving the instruction of phonemic awareness have employed large group instruction strategies. This study attempts to analyze the effects of an intervention that offers explicit, intensive instruction that is supplemental to regular reading instruction that occurs within the regular classroom. Also, other research previously mentioned has generally employed a large group experimental design in order to study the effects of phonemic awareness training. The current study proposes a single-subject design methodology. According to McCormick (1995), this methodology differs from pretest-posttest designs in that it allows the researcher to view quantifiable ongoing progress during the instructional process.

Limitations of the Study

Limitations of the study are listed and discussed below.

Since the Scott Foresman Early Reading Intervention Program was not compared to other instructional approaches, it is not evident whether the instructional approach of this program is any more effective than other instructional programs which incorporate the explicit teaching of phonemic awareness, letter-sound identification, and beginning decoding skills.
CHAPTER 2

REVIEW OF LITERATURE

This chapter will provide an overview of the need for early intervention for students identified as at-risk for reading failure. The next section will provide a brief explanation of the Big Ideas of Early Literacy and their role in the development of early reading skills. This section is followed by a discussion of the key ways that poor readers differ from effective readers, specifically highlighting the role of phonemic awareness. Next, the purpose of ongoing assessment throughout the intervention process will be discussed, including an overview of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), and the utility of DIBELS in measuring early reading outcomes. This chapter will conclude with a discussion of the use of the Scott Foresman Reading Intervention Program as a specific instructional approach to supplement classroom reading instruction for students identified as having poor phonemic awareness and early decoding skills.

The Need For Early Intervention

A substantial number of children fail to learn to read in the early grades. Much research has been dedicated to the tenet that the key to ameliorating reading
problems in children is early intervention. The developmental lag hypothesis, which suggests that students who do not readily acquire reading skills in the early grades will read when they are developmentally ready, has been disproven in several research studies. Remedial reading instruction in the upper grades has proven notoriously ineffective. Juel (1988) found that the probability of being a poor reader at the end of fourth grade when a student was a poor reader at the end of first grade was .88. Foorman and colleagues (1996) found that students identified as dyslexic in the first two grades of school, 82% were brought back to a normal classroom level of reading. As students reach grade 3, the rate of students brought back to normal classroom levels drops to 46%. By grade 5, only 10-15% of students identified as dyslexic are ever brought back to normal classroom reading level. Torgeson and colleagues (1997) found that 8 out of 10 children with severe word reading problems at the end of first grade performed below the average range at the beginning of third grade. Children whose reading difficulties are not effectively treated by the age of seven rarely catch up.

In order to understand the need for early intervention, one must take into account the cumulative effect that entering school with poor pre-reading skills has on a child. Small differences between individual children develop into larger and larger differences. In a review of research, Stanovich (1986) describes the reciprocal relationships between factors related to students becoming poor readers. This effect, commonly identified as the Matthew Effect in reading, leads to “the rich getting richer and the poor getting poorer.”
McCormick (1999) describes the following cyclical effect that keeps poor readers from making good gains.

“(Initially), genetic and/or environmental factors in the preschool years lead to poor phonemic awareness. Low phonemic awareness leads to difficulty in establishing word identification strategies. (This) lack of word identification strategies leads to less volume of reading text. Less text read leads to lack of development of automatic word recognition. Lack of automatic word recognition leads to slow and laborious reading. Slow and laborious reading leads to less text covered when students are required to read in instructional settings and to lack of motivation to engage in independent reading (and again to less text covered). Less text covered also means fewer word meanings learned from the context of reading material, less understanding of written syntactic structures, and less background knowledge built from information found in texts. Excessive attention to decoding words because of lack of automatic word recognition skills distracts concentration from comprehending text. Limited knowledge of word meaning and lack of familiarity with written syntactic structures inhibit comprehension. Lack of a sufficient background knowledge base detracts from comprehension. Less text covered leads to slower progress in general reading achievement.” (pg. 73)

Current school practices, which implicitly advocate a student’s extreme failure before appropriate intervention is provided, are counterintuitive. Given the outcomes of students who are identified as poor readers at the end of first grade, it is sufficient to assume that time is of the essence. Failure in the early grades is almost a guarantee of later school failure. In addition, the financial costs of providing long term remediation over prevention are astounding (Wasik & Slavin, 1993). For these reason, schools must allocate more resources to strategies that are directed at preschool and early primary grades. Waiting until a child is a year behind is too late. Wasik and Slavin (1993) highlight this point.

“Trying to remediate reading failure later on is very difficult because students who have experienced failure are likely to be unmotivated, with poor self-concepts as learners. They are anxious about reading, and they hate
No goal of (educational) reform is as important as seeing that all children start off their school careers with success, confidence, and a firm foundation in reading.” (p. 196)

School systems would have better outcomes by focusing remediation efforts on prevention. Research shows that effective early intervention programs can overcome the negative hurdles that are associated with coming from low socio-economic status with minimal support in later grades (Wasik & Slavin, 1993).

Hettleman (2003) advocates for a “zero tolerance” of early reading deficits, stating:

“the right to early diagnosis and treatment of reading difficulties must be recognized and pursued with the urgency and moral clarity of civil rights causes of the past. ….Students at risk of (reading) difficulties must be screened, taught using research-proven reading programs, assessed frequently, and provided with intense supplemental instruction as needed” (pg. 5).

Despite a wealth of research on effective practices for preventing reading difficulties, many schools do not readily put research into practice. Hettleman (2003) offers several global reasons why educators often lag behind in reform for early diagnosis and treatment of reading disabilities. First of all, lack of teacher training plays a key role. Many teachers believe, contrary to research, that struggling readers in the early grades will grow out of reading difficulties. Also, differing views among teachers of “developmentally appropriate instruction” and how to teach reading have been a barrier to the implementation of effective prevention strategies. Lack of funding for early intervention is also cited, as much federal and state funding is based on a remediation rather than a prevention model. Despite the long-term
cost-effectiveness of early reading intervention, costs to initiate such intervention are expensive in the short run.

Simmons and Kame’enui (2001) offer additional information about the failure to put effective research into practice, focusing specifically on the implementation of intervention. They pose four important reasons why effective practices, programs, and curricular accommodations have not been adopted or sustained in general school settings. First of all, interventions are too often implemented before an assessment is conducted of the contextual fit between the intervention and the "host environment" (e.g., school, classroom). Also, interventions are frequently adopted before a formative and continuous feedback loop is established at the "school-building level". Provision of priority information on the effectiveness of an intervention does not occur in a timely manner. Compounding the above difficulties is the fact that new interventions are often adopted for the short term, with little thought for the “long haul”. The newly adopted intervention is not adopted with specific contexts and host environments in mind. Lastly, many intervention practices require well-designed, systematic intervention and support that is sensitive to a child's growth and development.

Key Concepts of Early Literacy Acquisition: The Big Ideas of Early Literacy

Good and Kaminski (2002) cite the components of an effective reading approach as identified by the National Reading Panel (2000) and others. These components are identified as the Big Ideas In Reading, and are an extension of the original “Big Ideas” identified by Simmons and Kame’enui (1998). Effective reading
programs need to contain all components of the Big Ideas in Reading: phonemic awareness, the alphabetic principle, accuracy and fluency with connected text, vocabulary, and comprehension.

Phonemic awareness is the understanding that spoken words are made up of a sequence of sounds, and the ability to hear and manipulate sounds in spoken words. This skill is essential to learn to read in the alphabetic writing system. It is fundamental to mapping speech to print. If a child cannot hear that "man" and "moon" begin with the same sound or cannot blend the sounds /rrrruuuuuuunnnn/ into the word "run", he or she may have great difficulty connecting sounds with their written symbols or blending sounds to make a word. McCormick (1999) identifies two levels of phonemic awareness: simple and compound. Simple phonemic awareness consists of sound isolation (e.g. the first sound in cat is /k/, blending d-o-g=dog, segmentation dog=d-o-g). This simple level of phonemic awareness is a prerequisite to reading and writing. As the current study is interested in turning pre-readers into readers, it is the above-described simple phonemic awareness that will be the focus of outcome measures of this research.

Compound phonemic awareness involves two tasks: phoneme deletion and word-to-word matching. Phoneme isolation consists of isolating a word and blending the remaining letters. Word-to-word matching requires isolating a sound in a certain position in two words and comparing the two words (e.g. cat, cop, and coin begin with the same sound). Compound phonemic awareness appears to result from reading experience, but it may also be important for further advancement in reading and writing.
The alphabetic principle is the understanding that units of print map onto units of sound (Stanovich, 1986). This principle is composed of two parts, alphabetic understanding, or an understanding that words are composed of letters that represent sounds, and phonological recoding, using systematic relationships between letters and phonemes (letter-sound correspondence) to retrieve the pronunciation of an unknown printed string or to spell words. Phonological recoding consists of automatic word reading, irregular word reading, and advanced word analysis. Letter-sound knowledge is prerequisite to effective word identification. Because the English language is alphabetic, decoding is a crucial and primary means of recognizing words. A primary difference between good and poor readers is the ability to use letter-sound correspondence to identify words (Juel, 1991). Good readers must have a strategy to phonologically recode words. There are long-term reading benefits for students who acquire the alphabetic principle earlier in reading (Stanovich, 1986).

Fluency refers to the automatic, accurate, and effortless performance of a skill, in this case, reading connected text. Automaticity is reading words with no noticeable cognitive or mental effort. It is having mastered word recognition skills to the point of overlearning. Fundamental skills are so "automatic" that they do not require conscious attention. Fluency is not an end in itself but a critical gateway to comprehension. Fluent reading frees resources to process meaning. Beginning reading requires a rich and functional vocabulary. As children begin to read, reading vocabulary is mapped onto the oral vocabulary the learner brings to the task. Learners require access to the meanings of words that instructors use to
guide them in learning something new. Receptive vocabulary requires the
association of a specific meaning with a given label (as in reading or listening).
Expressive vocabulary requires the production of a specific label for a particular
meaning. As previously described, deficits in oral and receptive vocabulary, as well
as a lack of experience with written language vocabulary are significantly correlated
with reading difficulties.

Comprehension is the complex cognitive process involving the intentional
interaction between reader and text to extract meaning. It is the active and
intentional thinking in which interactions between text and reader construct meaning.
Fluency and comprehension are strongly linked. While fluent readers can have
difficulty with comprehension, children who are unable to read fluently are unable to
focus their attentional resources on comprehending text. Foorman and colleagues
(1996) found statistically significant correlations between students fluent decoding of
connected text and comprehension skills, with correlations ranging from .70 to .89.
Lack of word meaning also correlates highly with poor reading comprehension
(McCormick, 1999). Unfortunately, there is not a wealth of research on reading
comprehension and effective comprehension strategies. The National Reading
Panel (2000) concluded that the instruction of cognitive strategies improves reading
comprehension in readers with a range of abilities.

Key Differences Between Good Vs. Poor Readers

Evidence suggests that there are several factors that influence early literacy
skills. While some factors may play a more dominant role in an individual child’s
reading ability, reading difficulties in children are, in general, not caused by a single
factor, but rather a myriad of factors that act not in isolation, but work in an interactive fashion.

Research suggests that both genetic/biological and environmental factors contribute to reading difficulties. In a review of twin studies analyzing the influence of genetics and environment on reading disabilities, Olson and Gayan (2001) indicate that reading delays at the word recognition level were attributed to genetic influences at a level of .45 and environmental influences at a level of .55 (shared=.49, non-shared=.06). This research indicates that at this level, environment and genetic predisposition share an approximately equal contribution to reading delays. Of course, it should be noted that these studies look at large numbers of children, and are not able to explain individual differences. The above results are not able to make predictions about the role of genetics and environment on an individual child’s reading difficulty. Suffice it to say that evidence suggests that both genetic and environmental influences play a role in reading delays.

Stanovich (1986) proposes that phonemic awareness has a genetic as well as environmental base. Students with a weak inherited aptitude for a skill face greater difficulty in acquiring it.

Sociological factors have been proven to have a significant impact on reading performance. Several home factors have been associated with high achievement in reading. These factors include preschool experiences with books, parents’ interest in reading, high quality parental verbal interactions with child, and provision of space and opportunity for child to read (McCormick, 1999).
Children who are frequently read to, or have heard language used for conceptual discussions or abstract purposes have experiences with the decontextualized language in books. They also generally possess a larger vocabulary and greater conceptual knowledge that fosters reading comprehension. Senechal et. al. (1998) found young children who frequently heard storybooks read in the home knew the meaning of more words and had better listening comprehension.

Contrarily, regardless of socioeconomic status, children who come from homes in which language is used for direct communication often have difficulty with the decontextualized nature of books and in school (Juel, 1991). In a review of research, McCormick (1999, pg. 49) identified characteristics of households that correlate to low achievement in reading. This review indicates that poor readers have often come from households in which there is little encouragement of independent thinking skills and a lack of opportunities to practice such skills. These households often have fewer books in the home, and these children hear books read to them less frequently by their parents. Other home factors that contribute to reading difficulties include an unstructured lifestyle regarding home activities such as amount of television viewing, scheduled bedtime, or structured support of homework.

Contrary to much special education legislation, IQ-achievement discrepancies do not hold much utility in diagnosing good readers from poor readers. Children with high IQ’s generally experience early reading difficulties for the same basic reasons as children with lower IQ's (Hettleman, 2003). The idea that only students whose reading is significantly discrepant from their score on an intelligence test is not only
elitist, it is unethical. This practice implies that students with lower cognitive ability as measured by standardized intelligence tests are not “disabled" by functional illiteracy. It assumes that the only children who really need to read to be successful are those of at least average intelligence. The fact is that all children need to be readers to ensure not only school but life success. Hettleman (2003) reports that the IQ-achievement discrepancy “perversely results in high-IQ children with reading difficulties receiving more extra instruction than low-IQ children (with reading difficulties).”

Over and above the ethical mismatch of practices described above, research supporting their efficacy has not been borne out. Vellutino and colleagues (2001) found that IQ scores do not differentiate between difficult to remediate and readily remediated poor readers. In an analysis of performance profiles of poor readers, Stanovich and Siegel (1994) concluded:

“Neither the phenotypic nor the genotypic indicators or poor reading are correlated in a reliable way with IQ discrepancy. If there is a special group of children with reading disabilities who are behaviorally, cognitively, genetically, or neurologically different, it is becoming increasingly unlikely that they can be easily identified by using IQ discrepancy as a proxy for the genetic and neurological differences themselves. Thus, the basic assumption that underlies decades of classification in research and educational practice regarding reading disabilities is becoming increasingly untenable”(p. 48).

Practices like the one described above are not efficacious because they are built on a faulty conceptual model. Current research suggests that poor phonemic awareness, regardless of intelligence level, is the best predictor of reading failure in children (Stanovich and Siegel, 1994, Stanovich, 1986; McCormick, 1999, Fletcher et. al, 1994). Furthermore, it is apparent that deficits in phonemic awareness can be
identified and ameliorated in children as young as preschool and kindergarten (Kozminsky & Kozminsky, 1995; Brennan & Ireson, 1995; Lundberg et. al., 1988).

The Crucial Role of Phonemic Awareness

While all of the Big Ideas of Early Literacy are important for reading success, the current study is focused primarily on phonemic awareness, with some attention to the concept of phonological recoding within alphabetic principle. Reading is an activity that is based on language. McCormick (1999) identifies three major aspects of oral language: phonemes or sounds, syntax, which can be defined as sentence structure, and semantics, or meaning. Written language includes the additional component of graphemes or letters.

While poor readers share many characteristics related to language acquisition, the language area most strongly associated with reading problems is related to the use of phonemes. As stated earlier, much research suggests that poor phonemic awareness is the best predictor of reading failure in children. Differences in phonological decoding skills (using letter-sound relationship to identify unknown words) have been shown to account for individual differences in reading ability for readers of all ages (Stanovich, 1986). Without phonemic awareness, patterns of letter-sound correspondence necessary for word recognition are strange and arbitrary. A further explanation of phonemic awareness and its role in reading acquisition will be described in the subsequent section.

There is some dissension regarding the role phonemic awareness plays in reading acquisition. Some argue that use of contextual information is the true deficit in at-risk readers. Smith (1982) argues that reading difficulties are caused primarily
by the inability to use syntax and semantic information. Goodman (1976) contends that skill in reading involves broadening experiences, increasing conceptual development, and more accurate “guesses” based on sampling techniques. But as Stanovich (1986) points out in a review of research, poor readers not only use context, they often over rely on contextual information due to poor decoding skills.

Scholes (1998) argues based on research with adult readers and non-readers, that phonemic awareness is a consequence of alphabetic literacy rather than a precursor to reading acquisition. This author contends that since the ability to manipulate phonemes in words is not present in adult non-readers, but is present in readers, it is not possible that phonemic awareness is an untutored component of language. However, the above contention fails to differentiate simple phonemic awareness, the ability to segment words and a precursor to fluent decoding, from compound phonemic awareness, the ability to manipulate phonemes in words. As previously stated, compound phonemic awareness appears to occur as a result of reading experience, although it may play a role in later reading advancement.

It is also not an underlying assumption of this study that phonemic awareness is an untutored, natural component of language. In fact, the myth that reading acquisition comes naturally, similar to the acquisition of language is a myth that often leads to the at-risk readers not receiving adequate intervention (Hettleman, 2003). Reading and language acquisition appear to have similarities in that there appears to be a window of opportunity in which acquisition of these skills is most efficient. As previously stated, children who demonstrate significant reading difficulties after age seven rarely catch up (Juel, 1988, Foorman et. al, 1996, Torgeson et. al., 1997).
However, the acquisition of phonemic awareness is not simply a natural, developmental process. It is instead related to a reciprocal relationship between both genetic and environmental factors (Stanovich, 1996, McCormick, 1999).

In a review of current research, McCormick (1999) indicates that there is little doubt that lack of phonemic awareness is the cause of reading disabilities in a large portion of students whose difficulties lie with word recognition level. This statement is true across cultures, and regardless of socioeconomic status or intelligence level. This author goes on to indicate that one of the most significant discriminators between good and poor readers is that poor readers lack phonemic awareness.

Another reason for the focus on phonemic awareness is the fact that the development of two of the other Big Ideas, fluency and comprehension, are heavily contingent upon these two principles. It is not possible for students to develop fluency with connected text until students have developed strong phonemic awareness and an understanding of sound-symbol relationships. McCormick (1999) indicates that poor phonemic awareness leads to slow and laborious reading due to poor word recognition skills.

In a similar vein, fluency is a necessary requirement for comprehension to occur. Students who are not fluent readers are not able to dedicate the cognitive energy necessary to facilitate adequate understanding of text. Fletcher (1999) contends that slow, inaccurate decoding is the best predictor of poor reading comprehension. Padget (1998) indicates that reading comprehension skills are actually a combination of two distinct skills, word recognition and listening comprehension. Kozminsky & Kozminsky (1995) found that explicit instruction of
phonological awareness in kindergarten positively influenced students’ scores on measures of reading comprehension in the first grade.

The above evidence does not suggest that educators should forego reading instruction that includes fluency, vocabulary, and comprehension. Instruction in these areas is still important, and should continue to occur in the regular classroom setting. However, phonemic awareness is the primary deficit in most children who have reading difficulties and explicit instruction which focuses on these skills has been shown to improve reading outcomes.

Phonemic awareness is acquired in many ways. Stanovich (1986) suggests that there may be a genetic origin to poor phonemic awareness. However, the author goes on to indicate that the relationship between phonemic awareness is a reciprocal one. While phonemic awareness is necessary for literacy acquisition, reading acquisition facilitates phonemic awareness. Research indicates that experiences with the connected text in books increase phonemic awareness (McCormick, 1999).

The National Reading Panel’s review of research (2000) indicates that many children require direct instruction of phonemic awareness. This panel reviewed over 10,000 high quality research studies which examined the effectiveness of various instructional strategies for one or more skills in reading. Results of this review indicate that phonemic awareness is a critical skill in early literacy acquisition, and that this skill can be taught and learned. The review further advocated instruction which teaches children to notice, think about, and manipulate sounds in words. It is
recommended that these skills be taught in kindergarten and first grade, when children first begin to acquire reading skills.

Kozminsky & Kozminsky (1995) found that explicit instruction of phonological awareness in kindergarten resulted in statistically significant gains in reading versus students who did not receive explicit instruction. These gains later were predictive of first grade reading acquisition and reading comprehension. Brennan & Ireson (1997) also found greater gains on measures of phonological awareness for a group of London kindergarten children who received explicit instruction through metalinguistic games and exercises as compared to informal phonemic awareness instruction in the classroom. Lundberg, Frost, and Peterson (1988) found that direct instruction of phonemic awareness for preschoolers had a facilitating effect on subsequent reading and spelling acquisition. In a meta-analysis of thirteen phonemic awareness training studies of elementary children, Wagner and colleagues (1993) report an average effect size on phonological awareness of 1.23 SD units.

National Research Council (1998) advocates the need for kindergarten instruction to provide opportunities for children to engage in oral language interactions, including discussions about books, to kindle rich oral language vocabularies (to aid in reading comprehension later), and to begin training in phonemic awareness. Also underscored was the importance of developing language skills in the preschool years.

While it is possible to teach phonemic awareness skills in isolation, some research suggests that teaching these skills in correspondence with symbol-sound relationships yields potentially greater gains in reading. Foorman and colleagues
(1997) found that students who participated in fifteen minutes of daily instruction of phonological analysis skills showed statistically greater gains than children in the same curriculum who did not receive training. However, facilitation of reading occurred only if the program included transfer of phonological awareness skills to print. Torgeson (1997) found that explicit, intensive instruction that emphasizes the alphabetic code resulted in more favorable outcomes than a context-based or embedded approach. Teaching phonemic awareness skills in isolation may be an appropriate prevention model for preschool students. However, expectations for kindergarten students to master the alphabetic code and engage in real reading by the end of their kindergarten year makes the combination of instruction of phonemic awareness skills and the alphabetic principle efficacious for these children.

The Purpose of Ongoing Assessment

Effective programs employ ongoing and relevant assessment. A key part of effective instruction is the integration of an assessment-intervention feedback loop where instructional support is evaluated and instructional plans are modified based on student progress (Good et. al., 2001). Stecker and Fuchs (2000) assessed a group of students with mild to moderate disabilities and found that students for whom tailored instructional adjustments were made based on regular progress monitoring data performed significantly better on global achievement tests than did partners whose received a matched instructional adjustment which was not based on their own assessment data.

Individual student responses to a particular intervention strategy are unpredictable, and therefore must be monitored on a continual basis to ensure an
appropriate instructional match. For ongoing assessment to be effective, it must provide teachers with clear information about students' performance levels and progress. Assessment serves three important purposes in developing a reading intervention program: (a) identifying students in need of supplemental instruction, (b) guiding instructional planning, and (c) monitoring student progress (Good & Kaminski, 2001).

In order to effectively identify students who are in need of supplemental instruction, assessments must be predictive of later reading outcomes (Kaminski & Good, 1996). Measures of phonemic awareness strongly predict young children's future success in learning to read or, conversely, the likelihood that they will fail (Stanovich, 1986; McCormick, 1999, Fletcher et. al., 1994).

Assessment should also guide instruction. Assessment tools that reflect the most important aspects of the curriculum provide information about how an individual student performs within the classroom context. This type of assessment readily translates to planning instruction to meet specific student needs.

Finally, assessment tools that represent particular requisite skills are very useful in monitoring individual students' progress. Frequent, ongoing assessment gives educators with up-to-date, practical information to guide further instruction. Assessment is of little use unless it guides instruction.

One attempt to measure crucial early literacy skills can be found in the Dynamic Indicators of Basic Early Literacy Skills. The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) are a set of standardized, individually administered measures of early literacy development. They are designed to be short fluency
measures used to for identification and ongoing progress monitoring of the
development of pre-reading and early reading skills.

**DIBELS**

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) is a set of
tasks designed to assess students’ fluency with fundamental reading skills. DIBELS
is based on a prevention-oriented model, and is designed to assist in preempting
reading difficulties and supporting all children to achieve adequate reading outcomes
(Good & Kaminski, 2001).

In addition to being prevention-oriented, DIBELS is an outcomes-driven
model. Essentially, it is the application of the problem-solving model to early literacy
skills. The goal is to match the amount and type of instructional support with the
needs of the individual students to enable all students to reach each benchmark
step. This model accomplishes steps to outcomes through a set of five educational
decisions:  a) identifying need for support, b) validating the need for support, c)
planning support, d) evaluating and modifying support, and e) reviewing outcomes
(Kaminski & Good, 1998).

Studies have shown that the DIBELS assessments are predictive of later
reading proficiency. Good & Kaminski (1996) demonstrated that DIBELS
assessments have both predictive validity with respect to future reading performance
and are functionally related to reading acquisition. In their study of 78 kindergarten
and first grade students from a rural elementary school, DIBELS measures were
significantly positively correlated with student performance (range=.43 to .90, p <.01)
on several measures including curriculum-based measurement, Metropolitan
Readiness Test, Stanford Diagnostic Reading Test, and the Rhode Island Pupil identification Scale). The same study reports alternate-form reliability of DIBELS that are estimated to range from .97 to .99.

Results from the DIBELS can be used to evaluate individual student development as well as provide feedback toward instructional objectives. While not a comprehensive measure of specific early literacy skills, the DIBELS is a reliable and valid indication of students' early reading skills.

DIBELS has high utility in that these measures are designed to 1) measure growth in crucial skill areas reliably and validly 2) specify criterion levels of performance for a single measure, 3) assess performance on a continuum of linked measures that relate to one another, and 4) reliably document a child's progression toward meaningful outcomes (Good et. al. 2001).

The DIBELS consists of 7 assessments: Letter-Naming Fluency, Initial Sound Fluency, Phoneme Segmentation Fluency, Nonsense Word Fluency, Oral Reading Fluency, Story Retell, and Word Use Fluency. At this point, Story Retell and Word Use Fluency are optional assessments, as benchmarks for these subtests have not been assessed.

The DIBELS measures are specifically designed to assess all of the Big Ideas of Early Literacy: phonological awareness, alphabetic principle, fluency with connected text, vocabulary, and comprehension. The measures are linked to one another, both psychometrically and theoretically.

Phonemic awareness is assessed with two different DIBELS subtests, Initial Sounds Fluency (ISF) and Phoneme Segmentation Fluency (PSF). Initial Sound
Fluency is a measure of simple phonemic awareness assesses a child's skill to isolate and produce the initial sound of a given word, a measure of simple phonemic awareness (Kaminski & Good, 1996). Phonemic Segmentation Fluency (PSF) assesses a child's skill to produce the individual sounds within a given word. Specifically, the PSF measure assesses a student's ability to segment three- and four-phoneme words into their individual phonemes fluently.

The alphabetic principle is measured through the DIBELS Nonsense Word Fluency (NWF) and Letter Naming Fluency. Nonsense Word Fluency assesses a child's knowledge of letter-sound correspondences as well the ability to blend letters together to form unfamiliar "nonsense" (e.g., fik, lig, etc.) words. DIBELS Letter Naming Fluency measures rapid letter naming, a skill thought to be highly predictive of later reading outcomes.

Fluency with Connected Text is measured by DIBELS Oral Reading Fluency (ORF). Oral Reading Fluency is a standardized, individually administered test of accuracy and fluency with connected text. Students are asked to read aloud a short reading passage. A student’s score represents the number of correctly read words within a one minute time period.

DIBELS Retell Fluency has recently been added to DIBELS as a measure of reading comprehension. On this measure, students are asked to recall details of the reading passage they read during the Oral Reading Fluency portion of the assessment. The purpose of this measure includes 1) prevention of children learning the misrule that speed-reading without attending to meaning is desirable or
the intent of oral reading fluency measures, and 2) identification children whose comprehension is not consistent with their fluency (Good & Kaminski, 2002).

Another recent addition to the DIBELS is Word Use Fluency, an attempt to measure oral vocabulary. On this measure, students are presented with individual words and asked to use each given word in an individual sentence. A child’s score consists of total number of words used correctly within one minute. Both Retell Fluency and Word Use Fluency are not as well researched, as they are new additions to this assessment. The utility of these subtests in measuring the concepts of comprehension and vocabulary is yet unproven, and benchmarks for both subtests have yet to be established.

Good and Kaminski (2002) offer several advantages of using DIBELS for student assessment and progress monitoring. One advantage of using DIBELS is that it respects instructional time. Each measure takes no more than 3 minutes to administer and score per child and allows for rapid determination of students’ response to instruction.

Another advantage of using DIBELS is that the measures are instructionally relevant, in that they focus on aspects of early intervention that are proven by research. Assessments within the DIBELS have empirically validated and objective goals. While the importance of phonemic awareness is well established, the level of phonemic awareness sufficient for adequate reading progress must be established to effectively monitor interventions. In other words, it is important to know how much phonemic awareness is sufficient. The DIBELS attempts to operationalize the answer to this question. Each measure has an empirically validated score or
“benchmark” that has been found to be predictive of later reading proficiency. Conversely, students performing well below these benchmarks are at significant risk for reading difficulties. Explicitly stated goal levels are designed to improve instructional planning.

As early intervention has been identified as a critical element of reading success, it is not enough for students to simply meet a goal; they must meet the goal by a specified time period in order to make the necessary progress required to develop into proficient readers. Each assessment within the DIBELS not only establishes a benchmark, but also establishes a timeline for when students should reach benchmark goals.

Once students are identified as at-risk for reading difficulties, educators require timely feedback to ensure that the chosen interventions are effective. This must occur in order for assessment to drive instruction. An additional advantage of the DIBELS assessment is the availability of alternate forms of the DIBELS measures that can be utilized for progress monitoring. Most DIBELS measures have more than twenty progress monitoring forms, which allow student progress to be measured frequently in order to provide feedback regarding student response to intervention.

Other advantages of using DIBELS include ease of administration and cost effectiveness (Good & Kaminski, 2002).

Scott Foresman Early Reading Intervention Program

The Scott Foresman Early Reading Intervention Program is a prevention program designed for children who need early, intensive instruction in phonological
awareness in letter names, letter sounds, word reading, spelling, and simple sentence reading. The target grade is kindergarten, although it is also used selectively with first grade students who have not mastered critical early literacy skills. Since the Scott Foresman Early Reading Intervention Program is designed to be used with students before most students become readers, it is often identified as a prevention program rather than an intervention program. Like direct instruction programs, the Scott Foresman Early Reading Intervention Program uses a combination of carefully scripted, teacher-directed instruction and game format activities to teach and reinforce phonemic awareness, letter-sound recognition, word reading, spelling, and sentence reading. The activities are designed to increase children’s skills and knowledge in phonological awareness and alphabetic understanding.

The Scott Foresman Early Reading Intervention Program was developed out of a project initially titled Project Optimize (Simmons & Kame’enui, 2002). This project was developed as part of a grant from the U.S. Department of Education Office of Special Education Programs. The purpose of the grant was to study the components and intensity of instruction necessary to ensure that all children read by grade three.

The Scott Foresman Early Reading Intervention Program is designed for children who are the lowest achieving kindergarten and early first grade students. This program is not meant to be a substitute for real reading experiences that take place in the regular classroom. The program does not address the key components of comprehension and vocabulary in reading instruction, and does not give sufficient
time young readers need in the engagement of real reading of connected text. These experiences need to continue to occur in the regular classroom. For this reason, this program is considered a supplement to regular classroom reading activities.

Since the Scott Foresman Early Reading Intervention Program is a relatively new program, there is not an extensive body of research regarding intervention effectiveness. Early research indicates that its’ precursor, the Optimize Intervention Program, was effective in increasing the pre-reading skills of kindergarteners. The first study, conducted by Simmons, Kame’enui, and colleagues (in process) is a planned five-year longitudinal study currently in its second year. Details of the initial findings of the study are outlined by Simmons and Kame’enui (2002).

The study was designed to determine the relative efficiencies of three instructional prevention programs that emphasized instruction in phonemic awareness and the alphabetic code. Ninety-six kindergarten students from seven elementary schools participated in the study. Students in the study were all from Title One Schools. The average mobility for the schools in the study was 15-20%. The percentage of children eligible for free or reduced lunches ranged from 37-65%. The gender distribution of the kindergarten class was 58% male, 42% female.

Children falling in the bottom 25% on phonological awareness skills (as measured by DIBELS) were randomly assigned to one of three groups. Each group received 30 minutes of small group instruction five days per week for seven months. A certified teacher or teachers’ assistant carried out each of the interventions. The three interventions compared consisted of a) intervention which emphasized
phonological awareness and the alphabetic code and utilized instruction
characterized by high explicitness, b) an intervention which also utilized highly
explicit instruction with an emphasis on phonological awareness and the alphabetic
code as well as comprehension, and vocabulary, and 3) an intervention which
emphasized phonological awareness and the alphabetic code with moderately
explicit instruction.

The first group (code emphasis/high explicitness) used an intervention called
the Optimize Program (which would later become the Scott Foresman Early Reading
Intervention Program). The first fifteen minutes of instruction establishes phonemic
awareness skills, and introduces letter-name identification, letter-sound
identification, blending to read CVC words, selected irregular word reading, and
sentence reading of controlled text. The second fifteen minutes reinforce previously
taught phonological awareness and alphabetic skills and extend these skills through
the instruction of handwriting, integrated alphabetic and phonologic tasks, and
spelling.

The second group (code/comprehension/vocabulary emphasis/high
explicitness) received reading instruction in the first fifteen minutes that was similar
to the first fifteen minutes of the Optimize Program. The second fifteen minutes
emphasized story comprehension and vocabulary using repeated readings, story
retelling, an explicitly taught vocabulary words.

The third group (code emphasis/moderate explicitness) received instruction
via the Open Court Reading Program. This series is characterized by focused on
developing phonemic awareness implicitly through the study of sounds and letters.
Reading text using cues and prompts was also a strategy taught within this program. Additionally, Open Court includes a “read aloud” activity in which the teacher interactively read stories with the children, asking them to discuss the story, practice vocabulary from the story, predict events and answer questions about the story.

Preliminary results of this study indicate that the Optimize Program was more effective at improving students’ early literacy skills. While students in all three groups made progress, students participating in the Optimize Intervention demonstrated significantly higher scores on measures of segmenting, reading nonsense words, word identification, letter identification, writing and spelling. Students in the Optimize Group, who pre-intervention fell within the bottom 20% of their classmates, scored at an average 73rd percentile on the Word Reading Mastery Test. Students who participated in Optimize displayed faster learning rates and higher end-of-year reading levels. These students reached DIBELS PSF goals one month earlier than students in the other two groups. They reached NWF goals two months earlier than other students. While both groups moved the majority of children to the established level of proficiency, the Optimize group moved most of the lowest group to proficiency sooner. The systematic approach of the Optimize Intervention was also found to be more effective in working with the most at-risk students as significantly more of the lowest students reached acceptable levels of performance on measures of alphabetic understanding (48%).

Preliminary results also indicate that gains made during Optimize were maintained at the end of the first grade. Ninety-seven percent of the students who
participated in the Optimize Group maintained average to above average reading performance at the end of the first grade.

In addition to the Simmons and Kame’enui study, Riempa (2002) reports a small case study in which of the lowest 10 students identified within one kindergarten building, half of the students proceeded into first grade performing above the 75th percentile on grade level material. Four other students were receiving Title 1 support, and one student had been identified as in need of special education services.

In summary, it appears evident that early identification and intervention for students at risk of reading failure is a key component of preventing reading difficulties. As phonemic awareness has been shown to play a key role in early reading acquisition, instructional approaches that highlight the explicit instruction of this concept have been shown to have high utility. In addition to choosing an appropriate intervention, student progress must be monitored frequently to ensure intervention effectiveness. The following study will attempt to determine the efficacy of using the Scott Foresman Early Reading Intervention Program and the Dynamic Indicators of Basic Early Literacy Skills as an example of a prevention program which meets the above criteria.
CHAPTER 3

METHODOLOGY

Subject Selection

Subjects selected for this study consisted of nine kindergarten students who attended half-day kindergarten at a suburban school district in Ohio. Selected subjects range in age from 5 years, 8 months to 6 years, 5 months. The school district in the study consists of one elementary school, one middle school, and one high school. Enrollment is as follows: elementary-1,416 students, middle school – 584 students, high school – 592 students. Socioeconomic status of the families within the district generally ranges from middle to upper middle class. Less than 1% of students in the district are identified as economically disadvantaged. Reported racial background of students in the district is as follows: African-American – 4.6%, Asian- 5.9%, Hispanic – 1.6%, White – 85.4%, Mixed racial background – 2.4%.

The makeup of the students chosen for the intervention group differs somewhat from district averages. Of the nine students participating in the study, two students met the criteria for free or reduced price lunch. Racial background of the nine students is as follows: White, 89%, Hispanic, 11%.
Each of the nine subjects was selected for the present study due to their poor performance on the Dynamic Indicators of Basic Early Literacy Skills tests of Initial Sound Fluency and Letter-Naming Fluency. These assessments have been shown to be highly predictive of early literacy skills as described in greater detail below. Initially, 239 kindergarten students from a suburban school district were administered the DIBELS in September and January of kindergarten by their kindergarten teacher. Students were identified as at-risk by their performance on the January DIBELS administration. Students eligible to participate in the study included those who received a DIBELS instructional recommendation of ‘Intensive Support’. To receive this recommendation, students demonstrated performance on DIBELS measures of Initial Sound Fluency, Letter Naming Fluency, Phoneme Segmentation Fluency, and/or Nonsense Word Fluency that fell within the range of “Deficit”. These recommendations are derived based on the patterns of performance of over 30,000 kindergarten students across the country. Students who fell within this category were those who had scores on DIBELS Initial Sound Fluency of less than 10 phonemes per minute, scores on DIBELS Letter Naming Fluency of less than 15 letters correctly names within one minute, and scores on DIBELS Phoneme Segmentation Fluency of less than 7 phonemes per minute. These guidelines have been outlined by Good and Kaminski (2002) as predictive of later reading success. Specifically, these researchers found that students falling in this range during winter administration of the DIBELS have only an 18% chance of meeting the Phoneme Segmentation Fluency benchmark in the spring of kindergarten, and a 19% chance of meeting the Oral Reading Fluency benchmark
by the end of first grade. In addition to this standardized assessments, clinical judgment of the examiner and kindergarten classroom teachers was used to confirm poor phonemic awareness and letter recognition skills. The examiner met with individual kindergarten teachers to compare DIBELS results of the identified students with work samples in the classroom to confirm reading difficulties. Students with diagnosed pervasive developmental disorders were excluded from this study. Of the 239 students, 17 were measured to fall within the Deficit range. Students were then separated by participation in morning or afternoon kindergarten. Three morning kindergarten students and six afternoon kindergarten students were randomly selected for participation in this study, for a total of 9 students.

Parents of selected students participated in a phone conference with the experimenter. This conversation consisted of an explanation of the purpose of the study, issues of confidentiality, and the reporting of results. Each parent received through the mail an informational sheet explaining the nature of the study as well as a consent form for permitting their child to participate in the study. Written parent permission for participation in the study was obtained through this form via a return envelope provided to the parent. In an effort to eliminate the possibility of extraneous variable effects, the specific instructional approach used in the study was not discussed. All parents were provided specifics of the instructional approach used as well as an account of their child’s performance upon completion of the study. These results were also shared with the child’s teacher.

The final sample consisted of three morning kindergarten students and six afternoon kindergarten students. Once students were selected, they were assigned
to one of three treatment groups. Due to the nature of half-day kindergarten, only the six afternoon students were randomly assigned to a group. The three morning kindergarten students were required to be in the same group. While all three groups were provided with intervention based on the Scott Foresman Early Reading Intervention Program, length of intervention was varied by group. The first group of students received twelve weeks on instruction. The second group of students received ten weeks of instruction. The final group of students received eight weeks of instruction.

Setting

The above instructional intervention was conducted in the experimenter’s office at the above elementary school. The Intervention was conducted at a rectangular table that comfortably seats three students and the experimenter. Other furniture in the room consists of two desks, bookshelves, and a filing cabinet. Lighting in the room was adequate for instructional approaches used.

Experimenter

The experimenter is a female, doctoral candidate in the School Psychology program at The Ohio State University. This experimenter possesses sufficient training in education and school psychology as evidenced by certifications as a school psychologist and teacher of regular elementary education (grade 1-8), as well as five years experience as a school psychologist. The experimenter worked as a school psychologist in the school district in which the study was conducted.

In this study, the experimenter administered, scored, and interpreted results of all standardized assessments during the baseline and treatment phases of the
study. Independent observers were also used to score phoneme segmentation fluency and nonsense fluency probes during each phase of the study. An independent observer participated in 25% of all DIBELS assessments both during the baseline and treatment phase.

The instructional approach used in the study was also implemented by the experimenter.

**Standardized Norm-Referenced Instruments Used**

Standardized instruments that will be utilized to initially establish phonological awareness skills, letter-sound correspondence, and word identification skills include subtests of the Dynamic Indicators of Basic Early Literacy Skills, and the Woodcock-Johnson Psychoeducational Battery, Third Revision (Woodcock et. al., 2000).

**DIBELS**

Students' early reading skills were assessed using specific subtests included in the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) developed by Good and Kaminski (2002). DIBELS is a set of tasks designed to assess students' fluency with fundamental reading skills. The DIBELS tasks represent constructs that could be described as a progression of the foundational skills of early reading. These skills are prerequisite to reading success (Good et. al, 2001). The skills areas assessed within the DIBELS assessment include phonological awareness, letter-sound relationships (the alphabetic principle), letter recognition, and fluency with connected text (used for first grade), vocabulary, and story retell. As the assessments described above are designed to measure fluency, the score for each task reflects the number of correct responses given in a timed minute. This DIBELS measure
attempts to measure simple vs. compound phonemic awareness as it is simple phonemic awareness which appears to be a prerequisite for early reading (McCormick, 1999).

The DIBELS subtests were selected because of their predictive qualities. Tasks such as phoneme segmentation are known to be highly predictive of later reading outcomes and are represented in DIBELS. (Good et al., 2001). Therefore, DIBELS has impressive utility in identifying students at-risk for reading failure for intervention purposes, which is the primary purpose in this study.

Benchmark for the subtests within the DIBELS are cumulative in nature. For example, if students meet the Phoneme Segmentation Fluency benchmark by the end of kindergarten, they are likely to meet the mid-first grade benchmark of 50 more correctly identified sounds on NWF. If students reach this benchmark by Winter of first grade, they are highly likely to meet the established 40 or more words correct by the end of first grade on curriculum-based grade level reading passages which research has born out to be the benchmark of established reading fluency. Specifically, Good & Kaminski (2001) found that the odds of being an established reader as measured by oral reading fluency in May of first grade when meeting the PSF benchmark by the end of kindergarten was 37 out of 44, or 84%. Contrarily, the odds of being an established reader in oral reading fluency in May of first grade when a deficit was present in PSF (10 or fewer phonemes per minute) at the end of kindergarten was 1 out of 6 or 16%. This same study found that odds of being an established reader as measured by oral reading fluency in May of First Grade when established with NWF in January of First Grade is 23 out of 26, or 88%. The odds of
being an established reader on ORF in May of First Grade with a deficit in NWF (30 or below correct) in January of First Grade was 0 out of 6 or 0%.

The DIBELS measures phonemic awareness with two subtests. Initial Sounds Fluency (ISF) and Phoneme Segmentation Fluency (PSF). Initial Sound Fluency assesses a child's skill to identify and produce the initial sound of a given word, or simple phonemic awareness (Kaminski & Good, 1996). On this assessment, the examiner presents four pictures to the child, names each picture, and then asks the child to identify (point to or say) the picture that begins with the sound produced orally by the examiner. For example, the examiner says, "This is sink, cat, gloves, and hat. Which picture begins with /s/?" and the student points to the correct picture. The child is also asked to orally produce the beginning sound for an orally presented word that matches one of the given pictures. The examiner calculates the amount of time taken to identify/produce the correct sound and converts the score into the number of initial sounds correct in a minute. The ISF measure takes about 3 minutes to administer and has over 20 alternate forms to monitor progress. The benchmark goal for ISF is 25 or more phonemes per minute by the middle of kindergarten. Students who demonstrate scores of less than 10 phonemes per minute by the middle of kindergarten fall within the “Deficit” range. Intensive intervention is recommended for these students. Good and Kaminski (2002) report that alternate form reliability of ISF is .72 in January of kindergarten. Reliability using the Spearman-Brown Prophecy formula is measured to be .91. Concurrent criterion-related validity with DIBELS PSF was .48 in January of
kindergarten. The predictive validity of ISF with curriculum-based measurement oral reading fluency is .45 in spring of first grade.

DIBELS Phoneme Segmentation Fluency (PSF) (Good & Kaminski, 2002) assesses a child's skill to produce the individual sounds within a given word or break apart a word by pronouncing each phoneme in isolation. The PSF task is administered by the examiner orally presenting words of three to four phonemes. It requires the student to produce verbally the individual phonemes for each word. For example, the examiner says, "sat," and the student says "/s/ /a/ /t/" to receive three possible points for the word. After the student responds, the examiner presents the next word, and continues this procedure for exactly one minute. The PSF measure takes about 2 minutes to administer. The score for this measure represents the number of phonemes said aloud in a 1-minute period with the benchmark at 35-45 correct phonemes per minute expected to be reached by the end of kindergarten. Students who correctly identify 10 or fewer phonemes correctly by the end of kindergarten may need are identified to fall within the "Deficit" range and are predicted to require intensive instructional support. This measure also has over 20 alternate forms, which allow for the continued monitoring of student progress throughout intervention. Good and Kaminski (2002) report that the one-month alternate-form reliability of PSF is .79 in May of kindergarten, and the two-week alternate form reliability is .88. Criterion related validity with the Woodcock-Johnson Psycho-educational Battery Revised Readiness Cluster is .54 in the spring of kindergarten. The predictive validity of spring of kindergarten PSF with winter of first grade NWF scores is .62 with spring of first grade CBM oral reading fluency is .62.
The alphabetic principle is measured through the DIBELS Nonsense Word Fluency (NWF) and Letter Naming Fluency (Good & Kaminski, 2001). NWF measures knowledge of letter-sound correspondences as well ability to blend letters together to form unfamiliar "nonsense" (e.g., fik, lig, etc.) words. During the assessment, students are asked to read short vowel nonsense words, either by individual sound or by whole word. The student is presented an 8.5" x 11" sheet of paper with randomly ordered VC and CVC nonsense words and asked to produce verbally the individual letter sound of each letter or verbally produce, or read, the whole nonsense word. As an example, when the examiner presents the nonsense word "vaj", the student is required to either read each individual letter sound, /v/a/i/j/, or the whole word, “vaj”. The score for this measure represents the number of letter sounds read in a 1-minute period. Because the measure is fluency-based, students receive a higher score if they are phonologically decoding the word and receive a lower score if they are providing letter sounds in isolation. The benchmark for NWF is 25 correct letter sounds per minute by the end of kindergarten. Students who correctly identify less than 10 sounds on this measure by the end of kindergarten may require intensive instructional support. As with the ISF and PSF measures, the NSF assessment consists of at least twenty alternate forms for monitoring progress. The NWF measure also takes about 2 minutes to administer. Good and Kaminski (2002) report that the 1-month alternate form reliability for NWF is .83 in kindergarten. Criterion related validity in comparison with the Woodcock-Johnson Psycho-Educational Battery – Revised Readiness Clusteris.59 in February of first grade. The predictive validity of NWF in January of first grade with CBM oral
reading fluency in May of first grade is .82 and in May of second grade is .60. (Good and Kaminski, 2002).

DIBELS Letter Naming Fluency (LNF) measures rapid letter naming, a skill thought to be highly predictive of later reading outcomes. The student is given a page with rows of letters, both upper and lower-case, and is asked to name as many letters as possible within a 1-minute time frame. The benchmark goal indicated for LNF is 40 or more letters per minute by the end of kindergarten. Students who score less than 29 letters per minute by the end of kindergarten fall within the deficit range, and are predicted to require intensive intervention. Letter naming fluency does not have progress monitoring materials. Good and Kaminski (2002) report the following statistical properties for LNF. The 1-month alternate form reliability for LNF is reported to be .88 in kindergarten. These authors also report that the criterion-related of LNF with the Woodcock-Johnson Psychoeducational Batttery-Revised Readiness Cluster standard score is .70 in kindergarten. The predictive validity of kindergarten LNF with first grade curriculum-based measurement oral reading fluency is .71

Scores on the DIBELS assessments of Initial Sound Fluency, Phoneme Segmentation Fluency, and Nonsense Word Fluency are rated into one of three categories, Benchmark, Emerging, and Deficit.

Scores within the Benchmark range indicate demonstrated mastery of the measure skill. These students are predicted to require low levels of support to meet grade level reading expectations.
Scores within the Emerging range indicate that skills within this area are developing, but have not yet been mastered. Reading progress for these students is more difficult to predict than the other two categories. Strategic support within the regular classroom is generally recommended.

Scores within the Deficit range indicate that measured skills are significantly below other grade-level peers. Students who demonstrated performance within this range are at considerable risk of later reading difficulty. Intensive intervention is recommended for these students.

Grade-Level Administration

All 230 kindergarten students within the elementary school were assessed using DIBELS in September, January and May as part of regular curriculum assessments. These assessments were conducted by the students’ kindergarten teacher. Administration of DIBELS subtests followed DIBELS Administration and Scoring Guidelines and were as follows: September- Initial Sound Fluency, Letter-Naming Fluency, January- Initial Sound Fluency, Letter-Naming Fluency, Phoneme Segmentation Fluency, Nonsense Word Fluency, May- Letter-Naming Fluency, Phoneme Segmentation Fluency, Nonsense Word Fluency. Assessments conducted in January were used to identify the group of students eligible to participate in the intervention group. Assessments of other kindergarten students in September, January, and May were used to compare gains of students receiving intervention before and after treatment was carried out.
Progress-Monitoring

Students identified as participants in the intervention program were initially assessed using the DIBELS measures of Initial Sound Fluency (ISF), Letter-Naming Fluency (LNF) and Phoneme Segmentation Fluency (PSF) Baseline and treatment measures were limited to PSF and NWF as they most closely matched the outcomes to be measured in the study. Letter-naming fluency was not used, as alternate forms of the LNF subtest are not available. Four alternate forms of PSF and NWF were administered on four different days to establish a baseline. Baseline and treatment assessment were conducted using the following subtests of the DIBELS: Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF). During the baseline and instruction phases of the study, a Phoneme Segmentation Fluency and Nonsense Word Fluency probe selected from DIBELS progress monitoring materials was administered. During the baseline phase of the study, two probes per week were administered for two weeks. Once intervention began for the first group, one probe per week was administered each week for twelve weeks.

Scott Foresman Early Reading Intervention Program

The intervention utilized for the proposed study is the Scott Foresman Early Reading Intervention Program. As described earlier, this prevention program is designed for children who need early, intensive instruction in phonological awareness, letter names, letter sounds, word reading, spelling, and simple sentence reading. This program is generally appropriate for kindergarten students, although it can be used with early first grade students who have failed to master the above
concepts. This program utilizes scripted, teacher directed instruction, and daily
game activities to teach and reinforce early literacy skills. Skills are broken down
and systematically taught in component parts. For example, simple phonemic
awareness is taught by initially teaching students to identify the initial sound in a
word, then the final sound, and finally segmenting the word. Letter-sound
recognition is taught by focusing on the same letter for three to five sessions.
Eventually, higher order skills such as word reading, spelling, and sentence reading
are introduced. Repetition of skills is utilized with children reviewing previously
taught skills daily.

In order to facilitate appropriate intervention, the Scott Foresman Early
Reading Intervention Program utilizes a placement test to determine where each
child best fits within the program. This test assesses skills taught within the program
in the sequential order they are taught. One of eight starting points within the 126
lessons is recommended based on a student’s performance.
The Scott Foresman Early Reading Intervention Program is designed to be
presented in half-hour sessions in a small group of 3-5 students. This program
emphasizes the strategic and systematic instruction of phonemic awareness and
alphabetic understanding. The daily 30-minute lessons consist of two 15-minute
components delivered consecutively. The entire curriculum consists of 126
lessons, in which students sequentially move through basic to higher order skills.

The first fifteen minutes of instruction was used to establish and reinforce
phonemic skills of 1) first and last sound isolation, 2) sound blending, 3) sound
segmentation. Students are also introduced to activities that target letter-name
identification, letter-sound identification, blending to read CVC words, selected irregular word reading, and sentence reading of controlled text.

The second fifteen minutes reinforced previously taught phonological awareness and alphabetic skills and extended these skills through the instruction of handwriting and integrated alphabetic and phonologic tasks. These tasks begins with tracing and writing previously taught letters, and progresses to writing initial and final sounds in words, and then to systematic analysis of all sounds and letters in CVC and CVCC words.

The nine students in the study were administered the Placement Test within the Scott Foresman EarlyReading Intervention Program. As DIBELS results predicted, students within the study had significant difficulty isolating the initial sounds in words on this assessment. As this skill is the first in the hierarchy of skills taught by this program, the starting point recommended for each of the nine students was Lesson One.

While each group consisted of three children, it became necessary for afternoon groups of children (Groups 1 and 3) to be fluid in order to effectively link evaluation to instruction. This type of movement between groups was not possible for students in Group 2 as these students participated in morning vs. afternoon kindergarten. After the fourth week of instruction, it became apparent that one student in the twelve week group was not making adequate progress to continue moving forward with the lessons. Also, a student in the eight-week group appeared to be progressing easily through the lessons. Subsequently, it was determined that these two students should switch groups in order to allow the first student additional
opportunities to practice strategies learned in previous lessons as well as allow the second student to proceed at a more rapid pace through sequential reading intervention lessons. This switch will be discussed more thoroughly in the results section. A weekly evaluation of performance indicated that no changes were necessary for any of the other students.

**Woodcock-Johnson Psychoeducational Battery, Third Revision**

The Letter-Word Identification subtest of the Woodcock-Johnson Psychoeducational Battery, Third Revision (Woodcock et. al., 2000) was used to measure all subjects' word recognition skills before the commencement of intervention. This subtest measures the student’s performance on recognizing letters and words in isolation. This subtest yields a standard score based on a mean of 100 and a standard deviation of 15. An alternate form of the Letter-Word Identification subtest of the WJ-III will be administered at the end of intervention to determine students' progress in letter and word recognition.

**Experimental Design and Evaluation**

**Questions 1-4**

The effects of the Scott Foresman Reading Intervention Program were measured by two separate designs. First, a multiple-baseline across subjects design (Cooper, Heron, & Heward, 1987) was utilized to analyze the effects of the Scott Foresman Reading Intervention Program on the number of trials sufficient for students to reach a specified criterion level on tasks of phoneme segmentation and letter-sound recognition. In this design, one behavior is selected and measured for three or more subjects within the same setting. First, baseline data are collected.
During this phase, a number of responses are identified and measured over time to provide baseline against which change can be evaluated (Hersen & Barlow, 1976). After a baseline is established, the treatment (intervention) is implemented for one subject, or, in this case, one group of subjects while baseline conditions are maintained for the other groups. Once an established criterion is met (in the case of this study, after the first group of students have participated in nine sessions of intervention), the same intervention is applied to the second group of subjects, and so on, noting changes during instructional phases. This design has high utility for the proposed study in that, it allows for frequent measures of progress in order to measure intervention effectiveness, and allows for progress which can be easily charted to relay information regarding effectiveness to parents and teachers. The visual effects of the charted data make change easy to observe. Experimental control in this study will be demonstrated if there is a change in both level and trend in performance on Phoneme Segmentation Fluency and Nonsense Word Fluency probes after participation in intervention sessions.

Subjects were assigned to one of three groups based on their participation in either morning or afternoon kindergarten. All students selected fell within the Deficit/Significant Risk range on DIBELS measures of Initial Sound Fluency and Letter Naming Fluency in January of their kindergarten year.

Definition and Measurement of the Dependant Variable

The first dependent variable is defined as the number of correctly identified phonemes and letter-sounds named during a timed, one-minute interval on DIBELS Phoneme Segmentation Fluency and Nonsense Word Fluency Progress Monitoring
Probes. All probes consist of items of similar structure. For example, Phoneme Segmentation probes generally consist of words of three to four phonemes. Nonsense Word Fluency probes all consisted of nonsense words presented in a consonant-vowel-consonant format.

Baseline

Baseline data was collected on students’ performance on Phoneme Segmentation Fluency and Nonsense Word Fluency progress monitoring probes. Administration procedures followed specific directions outlined in the DIBELS Manual, 6th Edition. Four probes administered on four different days over two weeks were administered in an effort to establish a stable baseline across subjects. Once baseline was established, the first subjects began treatment or intervention. After a period of two weeks or six sessions, the second group of students began intervention, and so on.

Instruction/Procedure

As described in the previous section, the Scott Foresman Reading Intervention Program was used to improve students’ phonemic awareness and letter-sound recognition. This program focuses on letter-name identification, letter-sound identification, blending to read CVC words, selected irregular word reading, and sentence reading of controlled text.

Students in this study received three half-hour sessions of intervention per week for a period of twelve, ten, or eight weeks, for a total of thirty-six, thirty, and twenty-four sessions respectively. Students were grouped in small groups of three. Each lesson lasted approximately 30 minutes. Lessons were conducted for morning
students during the first hour of their school day. Lessons for the afternoon students were conducted during the last hour of their school day.

Lessons within the program contains a script to guide instruction. The instructor followed the script exactly. Lessons were presented in sequential order.

Each lesson followed a consistent pattern. As each group started with Lesson One, the first fifteen minutes of instruction established and reinforced the skill of initial sound isolation, letter-name identification, and letter-sound identification. After the first few weeks of lessons, final sound isolation was introduced.

Each lesson consisted of five to seven individual activities. Each lesson started with the presentation of a letter. A new letter was presented every three lessons, with previously taught letters reviewed throughout other activities in the lesson. Initially, the instructor provided the name and sound of the presented letter. Then students were asked to repeat the name and sound of the letter. After students repeated the letter name and sound, they were asked to provide choral and individual responses of the name and sound of the letter. Students also traced the letter, pronouncing the sound of the letter as they traced it.

Additional activities within each lesson varied and included such tasks as having the student identify the first sound in a spoken word presented with a picture card, determining which of a group of three words started with a presented sound, and matching letter names and sounds through songs or games such as concentration or go fish.

The second fifteen minutes reinforce previously taught phonological awareness and alphabetic skills and extend these skills through the instruction of
handwriting and integrated alphabetic and phonologic tasks. These tasks began with tracing and writing previously taught letters. Students observed the examiner trace and write the letter for the lesson. Students then traced letters on a worksheet with their finger and with their pencil. Finally, students wrote letters with and without a model. After practicing the letter of the day, students then practiced writing each previously taught letter once.

Additional activities included isolating and writing the letter for beginning and ending sounds in words, writing the letter to match a picture's first or last sound, and writing dictated letters on a dry erase board.

During the instruction period, progress for students in baseline and intervention phase continued to be monitored weekly through Phoneme Segmentation Fluency and Nonsense Word Fluency Probes. Administration setting and guidelines for progress-monitoring probes did not differ for baseline or treatment phases. Monitoring took place after the third lesson each week. Students were monitored at various times throughout their school day outside at a table outside their kindergarten classroom.

Benchmarks for mastery of each task was measured by a score of at least 35 phonemes per minute on Phoneme Segmentation Fluency probes, and a score of at least 25 correctly-identified letter-sounds per minute on Nonsense Word Fluency probes.

In an attempt to determine the social validity of this intervention, descriptive statistics based on the growth and performance of students participating in the intervention versus other kindergarten students not chosen for the intervention study
will be reported. Rates of growth on DIBELS ISF between September and January (pre-intervention) and DIBELS PSF and NWF between January and May (post intervention) are reported.

**Question 5**

The second objective will be measured using a one-factor repeated measure analysis of variance (ANOVA) (Kennedy & Bush, 1985). WJ-III Letter-Word Identification Test Pre-and post-test standard scores of students participating in the Scott Foresman Reading Intervention Program will be analyzed to determine whether statistically significant gains have been made in letter-identification and word reading. The purpose of the ANOVA is to determine whether differences between two samples of data are caused by systematic treatment effects, or simply due to sampling error, or the within-subject effects associated with the use of repeated measurements. The ANOVA yields an F rational which is compared to a criterion value which is established by the alpha level or level of confidence. The alpha level selected for the proposed study is .05. The one-factor repeated measures ANOVA has high utility for measuring data over time, and is suitable for use with groups where n<20 (Kennedy & Bush, 1985).

The dependent variable for the above question was the standardized scores on the WJ-III Letter-Word Recognition test, administered to all students who participated in the Early Reading Intervention Program. Before intervention began, all nine students who participated in the study were administered the Letter-Word Recognition test of the Woodcock-Johnson Psycho-Educational Battery, Third Revision (Woodcock et. al., 2000). At the end of intervention, each of the nine
students was administered an alternate form of the WJ-III Letter-Word Recognition Test. These scores were compared with pre-test scores acquired at the beginning of the intervention with a one-way repeated measures ANOVA to determine if significant gains in standardized scores were present in this group of children after participating in intervention.

Subsequent analysis of group by (intervention) treatment effects were also analyzed to determine whether significant differences in performances exist between the students based on the length of intervention they received.
CHAPTER 4

RESULTS

This chapter presents the results of the study. The chapter begins with a discussion of procedural integrity and interobserver agreement. Student performance data and statistical analysis are presented individually according to each research question. The final section presents social validity results. **Interobserver Agreement**

As previously indicated, an independent observer participated in 25% of all DIBELS assessments both during the baseline and treatment phase. Observer agreement on the scoring of DIBELS assessments was calculated by using the following formula:

\[
\text{Agreements} \cdot \frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100
\]

Interobserver agreement between the examiner and independent observer was considered good with 92% agreement with individual DIBELS subtest scores.
Student Results

Individual student data were collected throughout the study. The subjects’ scores on the DIBELS subtests of Phoneme Segmentation Fluency and Nonsense Word Fluency were calculated to determine the students’ mean scores for both tests during baseline and treatment phases. The scores for these subtests were calculated by treatment groups.

Results of Phoneme Segmentation Fluency (PSF) and Nonsense Word Fluency measures for all individuals will be presented in four figures. Figure 1 presents the PSF scores for all students as charted by group. Figure 2 presents the mean PSF scores for each group of students. Figure 3 the NWF scores for all students as charted by group. Figure 4 presents the mean NWF scores for each group of students. The following information provides a narrative description of each subjects’ results by group.

Group One

Group One received twelve weeks of intervention for a total of 36 instructional sessions. Individual student results are as follows.

Elaine

Elaine’s scores on PSF assessments ranged from 5 to 7 with a mean of 5.75 phonemes per minute during baseline conditions. Her scores on NWF assessments were 0 with a mean of 0.0 letter sounds per minute. With the implementation of the Scott Foresman Reading Intervention, Elaine’s scores on PSF assessments ranged from 17 to 51, with a mean of 35.67. During intervention, Elaine’s scores on NWF measures ranged from 1 to 25, with a mean of 10.67 letter sounds per minute.
Molly

Molly’s scores on PSF assessments ranged from 0 to 2 with a mean of 1.25 phonemes per minute during baseline conditions. Her scores on NWF assessments were 0 with a mean of 0.0 letter sounds per minute. With the implementation of the Scott Foresman Reading Intervention, Molly’s scores on PSF assessments ranged from 7 to 35, with a mean of 21.33. During intervention, Molly’s scores on NWF measures ranged from 4 to 33, with a mean of 22.50 letter sounds per minute.

Mike

Mike’s scores on PSF assessments were 0 with a mean of 0.0 phonemes per minute during baseline conditions. His scores on NWF assessments were also 0 with a mean of 0.0 letter sounds per minute. With the implementation of the Scott Foresman Reading intervention, Mike’s scores on PSF assessments ranged from 0 to 8, with a mean of 3.58. During intervention, Mike’s scores on NWF measures ranged from 0 to 8, with a mean of 2.75 letter sounds per minute.

Group Two

A description of performance for students in Group Two follows. These students received ten weeks of intervention for a total of 30 sessions.

Alaina

Alaina’s scores on PSF assessments ranged from 3 to 7 with a mean of 4.5 phonemes per minute during baseline conditions. Her scores on NWF assessments ranged from 1 to 3 with a mean of 1.67 letter sounds per minute. With the implementation of the Scott Foresman Reading Intervention, Alaina’s scores on PSF assessments ranged from 10 to 41, with a mean of 21.7. During intervention,
Alaina’s scores on NWF measures ranged from 7 to 21, with a mean of 15.60 letter sounds per minute.

**Lance**

Lance’s scores on PSF assessments ranged from 0 to 3 with a mean of 1.00 phonemes per minute during baseline conditions. His scores on NWF assessments were 0 with a mean of 0.0 letter sounds per minute. With the implementation of the Scott Foresman Reading Intervention, Lance’s scores on PSF assessments ranged from 8 to 19, with a mean of 13.9. During intervention, Lance’s scores on NWF measures ranged from 0 to 12, with a mean of 5.60 letter sounds per minute.

**Nate**

Nate’s scores on PSF assessments were 0 with a mean of 0.0 phonemes per minute during baseline conditions. His scores on NWF assessments were also 0 with a mean of 0.0 letter sounds per minute. With the implementation of the Scott Foresman Reading Intervention, Nate’s scores on PSF assessments ranged from 1 to 9, with a mean of 3.40. During intervention, Nate’s scores on NWF measures ranged from 0 to 9, with a mean of 3.70 letter sounds per minute.

**Group Three**

Group Three received eight weeks of intervention for a total of 24 instructional sessions. Individual student results are as follows.

**Don**

Don’s scores on PSF assessments ranged from 0 to 15 with a mean of 5.00 phonemes per minute during baseline conditions. His scores on NWF assessments ranged from 3 to 8 with a mean of 4.38 letter sounds per minute. With the
implementation of the Scott Foresman Reading Intervention, Don’s scores on PSF assessments ranged from 19 to 39, with a mean of 29.13. During intervention, Don’s scores on NWF measures ranged from 12 to 30, with a mean of 19.63 letter sounds per minute.

**Josh**

Josh’s scores on PSF assessments ranged from 0 to 13 with a mean of 5.25 phonemes per minute during baseline conditions. His scores on NWF assessments were 0 with a mean of 0.0 letter sounds per minute. With the implementation of the Scott Foresman Reading Intervention, Josh’s scores on PSF assessments ranged from 17 to 43, with a mean of 32.38. During intervention, Josh’s scores on NWF measures ranged from 7 to 15, with a mean of 9.63 letter sounds per minute.

**Lisa**

Lisa’s scores on PSF assessments ranged from 0 to 9 with a mean of 3.88 phonemes per minute during baseline conditions. Her scores on NWF assessments ranged from 0 to 4 with a mean of 1.75 letter sounds per minute. With the implementation of the Scott Foresman Reading Intervention, Lisa’s scores on PSF assessments ranged from 15 to 21, with a mean of 17.50. During intervention, Lisa’s scores on NWF measures ranged from 8 to 11, with a mean of 6.63 letter sounds per minute.

**Instructional Changes**

In an effort to utilize assessment information to guide instruction, results of progress monitoring were analyzed to determine the appropriateness of group makeup for Groups 1 and 3. After the fifth week of intervention, it became apparent
that Mike did not appear to be responding to the intervention as expected, as he was not making expected gains on DIBELS PSF and NWF measures. Observations of Mike’s performance in group also indicated that Mike continued to have difficulty isolating the initial sounds in words, and had not effectively mastered the letters and sounds presented in the first twelve lessons. Further analysis of other students’ performance indicated that Don was making above average progress during his first week of intervention. A review of placement test results indicated that, while Don had not mastered the skill of initial sound isolation, the first in the sequentially-taught skills taught within the program, he had mastered the letter names and sounds presented in the first twelve lessons. Since Lesson Twelve and several of the proceeding lessons continued to provide instruction and review of the skill of initial sound isolation, a decision was made for Mike and Don to switch groups. This switch would provide Mike with an opportunity for additional instruction on the skills he had not mastered. Don would also be provided an opportunity to receive instruction that more appropriately matched his instructional level. No other changes in group placement were indicated by student performance in Groups 1 and 3.

The first measured data point after Mike and Don switched groups was Session 9. A review of Mike’s progress indicates that no significant gains were made on DIBELS PSF. A moderate increase on DIBELS NWF is noted. However, Mike did continue to make additional progress throughout the intervention. Don did well in his new group and continued to make good progress throughout the rest of the intervention period.
Research Question Number One

Will students improve their phonemic awareness skills as measured by DIBELS Phoneme Segmentation Fluency Test as a function of participation in the Scott Foresman Early Reading Intervention Program?

The graphs in Figures 1 and 2 depict individual student progress by groups and mean student progress during baseline and intervention stages. During the collection of baseline data, students’ PSF scores ranged from 0-15 with a mean score of 3.22 phonemes per minute. During the intervention phase, students’ PSF scores ranged from 0- 51 with a mean score of 19.08 phonemes per minute.

To further investigate the above question, gains made by students in the intervention group will be compared with gains made by other kindergarten students. These gains will be compared both pre- and post- intervention. As previously stated, it was not possible to directly compared PSF and NWF gain scores pre- and post- intervention as these subtests are not administered during the Fall DIBELS administration for kindergarten students. It was possible to compare students’ scores between September and January by utilizing another measure of phonemic awareness, DIBELS Initial Sound Fluency (ISF). ISF and PSF are both designed to measure phonemic awareness. ISF measures initial sound isolation, while PSF measures phoneme segmentation for an entire word. Concurrent criterion-related validity of DIBELS ISF with DIBELS PSF was .48 in January of kindergarten.

Table 1 depicts the ISF scores for the nine students chosen for intervention between September and January, before students received any intervention. The
data indicates that students in the intervention group demonstrated ISF scores that ranged from 1-6 phonemes per minute with a mean score of 3.67 in September. By January, these students earned ISF scores that ranged from 4-12, with a mean score of 6.11 phonemes per minute, a gain of 2.44 phonemes. By comparison, the other 230 kindergarten students earned ISF scores in September that ranged from 0-42, with a mean score of 11.75. In January, the same students demonstrated ISF scores that ranged from 2-47, with a mean score of 22.57, an increase of 10.82 phonemes during the same time period.

Table 1 also depicts a comparison of gain scores for the nine students in the intervention group in comparison with 230 other kindergarten students attending the elementary school for PSF and NWF, administered during January and May. During the January DIBELS assessment, the students chosen for the intervention gain demonstrated PSF scores, which ranged from 0-5 with a mean of 1.56. Phonemes per minute for each student during May data collection
Figure 1: Student PSF Performance for Groups 1, 2, and 3
Figure 2: Mean PSF Scores for Groups 1, 2, and 3
ranged from 8-51 with an mean score of 28.89, yielding an average increase in performance of 27.33 phonemes per minute between January and May. By comparison, scores for the 230 other kindergarten students demonstrated PSF scores in January, which ranged from 0-47, with a mean of 20.11. In May, the same group of students demonstrated scores, which ranged from 0-72, with a mean score of 37.46, for an average increase in performance of 17.35 phonemes per minute. Thus, while students in the intervention group were performing within the bottom 10% of their classmates in January, the intervention group gained more phonemes per minute on average than their classmates.

Research Question Number Two

Will students reach a specified benchmark of phonemic awareness as measured by DIBELS Phoneme Segmentation Fluency Test as a function of participation in the Scott Foresman Early Intervention Program?

Table 2 depicts the number and percentage of students’ per group who fell within the categories of Benchmark, Emerging, or Deficit as measured by DIBELS PSF. Of the nine students who participated in the study, 55.6% or 5 students reached the established DIBELS Kindergarten Spring PSF benchmark of 35-45 phonemes per minute. Of the five students to meet benchmark, two received twelve weeks of intervention, one received 10 weeks of intervention, and two received eight weeks of intervention.

Of the students who did not meet benchmark, 22.2% or 2 students fell within the DIBELS range of Strategic Support. Students who fall within this range
<table>
<thead>
<tr>
<th></th>
<th>ISF</th>
<th>PSF</th>
<th>NWF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention Group</strong> (n=9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>3.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>6.11</td>
<td>1.56</td>
<td>0.67</td>
</tr>
<tr>
<td>May</td>
<td></td>
<td>28.89</td>
<td>17.33</td>
</tr>
<tr>
<td><strong>Gain</strong></td>
<td>2.44</td>
<td>27.33</td>
<td>16.67</td>
</tr>
<tr>
<td><strong>Other Kindergarten Students</strong> (n=230)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>11.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>22.57</td>
<td>20.11</td>
<td>21.46</td>
</tr>
<tr>
<td>May</td>
<td></td>
<td>37.46</td>
<td>33.33</td>
</tr>
<tr>
<td><strong>Gain</strong></td>
<td>10.82</td>
<td>17.35</td>
<td>11.87</td>
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</table>

Table 1
Mean ISF, PSF, and NWF scores of Intervention and Other Kindergarten Students at September, January, and May DIBELS Monitoring
<table>
<thead>
<tr>
<th>Intervention</th>
<th>Deficit Number</th>
<th>Deficit Percentage</th>
<th>Emerging Number</th>
<th>Emerging Percentage</th>
<th>Benchmark Number</th>
<th>Benchmark Percentage</th>
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<td>12 weeks (n=3)</td>
<td>1</td>
<td>(33.33%)</td>
<td>0</td>
<td>(0.0%)</td>
<td>2</td>
<td>(66.67%)</td>
</tr>
<tr>
<td>10 weeks (n=3)</td>
<td>1</td>
<td>(33.33%)</td>
<td>1</td>
<td>(33.33%)</td>
<td>1</td>
<td>(33.33%)</td>
</tr>
<tr>
<td>8 weeks (n=3)</td>
<td>0</td>
<td>(0.0%)</td>
<td>1</td>
<td>(33.33%)</td>
<td>2</td>
<td>(66.67%)</td>
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<tr>
<td>Total (n=9)</td>
<td>2</td>
<td>(22.22%)</td>
<td>2</td>
<td>(22.22%)</td>
<td>5</td>
<td>(55.56%)</td>
</tr>
</tbody>
</table>

Table 2

Number and Percentage of Intervention Students Within Each DIBELS Category after Intervention as Measured by DIBELS PSF
generally receive reading instruction within the regular classroom. The remaining 22.2% (2 students) fell within the DIBELS range of Deficit, indicating that they will continue to require intensive reading intervention.

Research Question Number Three

Will students improve their beginning decoding skills as measured by DIBELS Nonsense Word Fluency as a function of participation in the Scott Foresman Early Reading Intervention Program?

The graphs in Figures 3 and 4 depict individual student progress by group as well as group means during baseline and intervention phases. Students’ performance on the DIBELS NWF was again noted to increase as a function of participation in intervention. During the collection of baseline data, students’ NWF scores ranged from 0-8 with a mean score of 1.09 correct letter sounds per minute. During the intervention phase, students’ NWF scores ranged from 0-33 with a mean score of 11.02 correct letter sounds per minute.

Referring again to Table 1, during the January DIBELS assessment, the students chosen for the intervention gain demonstrated NWF scores which
Figure 3: Student NWF Performance for Groups 1, 2, and 3
Figure 4: Mean NWF Scores for Groups 1, 2, and 3
ranged from 0-3 with a mean of 0.67. Correct letter sounds per minute for each student during May data collection ranged from 8-31 with a mean score of 17.33, yielding an average increase in performance of 16.67 correct letter sounds per minute between January and May. By comparison, other kindergarten students demonstrated January NWF scores that ranged from 0-127, with a mean of 21.46. In May, NWF scores for the same group of students ranged from 0-147, with a mean score of 33.33. Therefore, the other kindergarten students demonstrated an average increase of 11.87 correct letter sounds per minute. Again, students in the intervention group gained more correct letter sounds per minute on average than their classmates.

**Research Question Number Four**

Will students reach a specified benchmark of early reading decoding skills as measured by DIBELS Nonsense Word Fluency as a function of participation in the Scott Foresman Early Reading Intervention Program?

Table 3 depicts the number and percentage of students’ per group who fell within the categories of Benchmark, Emerging, or Deficit as measured by DIBELS NWF. Of the nine students who participated in the study, 33.3% or 3 students reached the established DIBELS Spring Kindergarten NWF benchmark of 25 or more letter-sounds per minute. Of the three students to meet benchmark, two received twelve weeks of intervention, and one received eight weeks of intervention.
<table>
<thead>
<tr>
<th>Duration (n)</th>
<th>Deficit Number</th>
<th>Deficit Percentage</th>
<th>Emerging Number</th>
<th>Emerging Percentage</th>
<th>Benchmark Number</th>
<th>Benchmark Percentage</th>
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<tbody>
<tr>
<td>12 weeks (n=3)</td>
<td>1</td>
<td>(33.33%)</td>
<td>0</td>
<td>(0.00%)</td>
<td>2</td>
<td>(66.67%)</td>
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<tr>
<td>10 weeks (n=3)</td>
<td>1</td>
<td>(33.33%)</td>
<td>2</td>
<td>(66.67%)</td>
<td>0</td>
<td>(0.00%)</td>
</tr>
<tr>
<td>8 weeks (n=3)</td>
<td>1</td>
<td>(33.33%)</td>
<td>1</td>
<td>(33.33%)</td>
<td>1</td>
<td>(33.33%)</td>
</tr>
<tr>
<td>Total (n=9)</td>
<td>3</td>
<td>(33.33%)</td>
<td>3</td>
<td>(33.33%)</td>
<td>3</td>
<td>(33.33%)</td>
</tr>
</tbody>
</table>

Table 3

Number and Percentage of Intervention Students Within Each DIBELS Category after Intervention as Measured by DIBELS NWF
Of the students who did not meet benchmark, 33.3% or 3 students fell within the DIBELS range of Strategic Support. The remaining students, (33.3%, 3 students) fell within the DIBELS range of Deficit.

**Research Question Number Five**

Will students make significant gains in word reading and letter identification as measured by the Woodcock-Johnson Psycho-Educational Battery Letter/Word Identification Test as a function of participation in the Scott Foresman Early Reading Intervention Program?

Table 4 depicts pre- and post test means and standard deviations of students’ standard scores on the WJ-III, Letter/Word Identification Test. Before the onset of intervention, students’ standard scores ranged from 73-108, with a mean of 85.89 and a standard deviation of 11.38. At the conclusion of intervention, students’ standard scores on an alternate form of the WJ-III Letter/Word Identification Test ranged from 77-115, with a mean of 92.67 and a standard deviation of 11.43. A repeated-measures ANOVA was performed in order to determine whether students demonstrated significant gains on the WJ-III after receiving intervention. Analysis of group (length of intervention) x intervention effects was also conducted to determine if the number of intervention sessions played a significant role in students’ gain scores. Table 5 depicts the results of this analysis. Results indicate that students made significant gains in letter/word identification as measured by the WJ-III (F=6.372, p=045). The effect size for this analysis was .52. However, group x intervention effects were not significant. (F=.187, p=.834),
<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1 (12 Weeks)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>82.00</td>
<td>90.67</td>
</tr>
<tr>
<td>Std.</td>
<td>7.00</td>
<td>12.09</td>
</tr>
<tr>
<td><strong>Group 2 (10 Weeks)</strong></td>
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<tr>
<td>Mean</td>
<td>85.67</td>
<td>90.33</td>
</tr>
<tr>
<td>Std.</td>
<td>13.01</td>
<td>9.67</td>
</tr>
<tr>
<td><strong>Group 3 (8 Weeks)</strong></td>
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<td></td>
</tr>
<tr>
<td>Mean</td>
<td>90.00</td>
<td>97.00</td>
</tr>
<tr>
<td>Std.</td>
<td>15.87</td>
<td>15.87</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>87.29</td>
<td>94.00</td>
</tr>
<tr>
<td>Std.</td>
<td>6.72</td>
<td>10.08</td>
</tr>
</tbody>
</table>

Table 4

Means and Standard Deviations of WJ-III Pre- and Post-Test Scores by Intervention Group
<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between Subjects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>1</td>
<td>206.722</td>
<td>*6.372</td>
</tr>
<tr>
<td>Intervention x Group</td>
<td>2</td>
<td>6.056</td>
<td>.187</td>
</tr>
<tr>
<td>Error (Intervention)</td>
<td>6</td>
<td>32.444</td>
<td></td>
</tr>
<tr>
<td><strong>Within Subjects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>2</td>
<td>84.389</td>
<td>.297</td>
</tr>
<tr>
<td>Error</td>
<td>6</td>
<td>284.556</td>
<td></td>
</tr>
</tbody>
</table>

*p<.05

Table 5

Repeated Measure Analysis of Variance on Pre-Test and Post-Test by Intervention Group
indicating that no significant differences in performances exist between the students based on the length of intervention they received.
CHAPTER 5

DISCUSSION

This chapter includes a discussion of the results as they relate to each research question. Implications for future research and practice are also discussed.

The purpose of the study was to determine whether direct, small-group instruction in phonemic awareness, letter-sound recognition, and beginning decoding skills for pre-reading kindergartners who have been identified as possessing poor phonemic awareness will positively influence the attainment of critical benchmarks of early literacy skills. Effectiveness of one such approach, the Scott Foresman Early Reading Intervention Program, was determined by comparing students’ scores on various subtests of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) after participating intervention to baseline conditions when no instruction was given. This experimenter examined students’ scores on Phoneme Segmentation Fluency (PSF) and Nonsense Word Fluency (NWF) measures of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS).

The use of DIBELS PSF and NWF to monitor progress was appropriate for this study because the goal of the chosen intervention was to increase phonemic awareness skills and beginning decoding skills. Both DIBELS PSF and NWF were
well-suited for this task as they have high utility for frequent monitoring and scores on these subtests appeared to be sensitive to subtle growth within the areas measured. In support of the findings of Good & Kaminski (2002) DIBELS was found to be well suited to measure intervention effectiveness in that administration of PSF and NWF progress monitoring probes was simple and brief. Multiple forms provided by the DIBELS allowed for efficient and frequent monitoring of intervention progress. DIBELS PSF and NWF were observed to be sensitive to student gains in performance.

Research Question Number One

Will students improve their phonemic awareness skills as measured by DIBELS Phoneme Segmentation Fluency Test as a function of participation in the Scott Foresman Early Reading Intervention Program?

All nine students made progress during the intervention stage as measured by DIBELS PSF in contrast to baseline conditions when no intervention was provided. These graphs clearly show a greater increase in student performance during the intervention phase as compared with baseline phase.

Students who participated in the intervention increased their phonemes per minute not only in relation to the baseline conditions, but also in relation to other kindergarten students. Progress for students chosen for the intervention from September to May (pre-intervention) was slow and significantly behind other kindergarten peers. Students in the intervention group were performing within the bottom 10% of their classmates in January. However, these same students gained more phonemes per minute on average than their classmates after participating in
the intervention. The data suggests a functional relationship between the Scott Foresman Early Reading Intervention Program and the improvement of phonemic awareness skills.

Research Question Number Two

Will students reach a specified benchmark of phonemic awareness as measured by DIBELS Phoneme Segmentation Fluency Test as a function of participation in the Scott Foresman Early Intervention Program?

Five of the nine students reached the established DIBELS Kindergarten Spring PSF benchmark of 35-45 phonemes per minute. While the other four students did not reach benchmarks, all were continuing to make progress toward the benchmark goals at the conclusion of intervention. The trend of performance of these students does not suggest that the intervention was ineffective, rather that the length of the intervention was insufficient for the students to reach benchmark criteria.

Results are inconclusive as to what length of intervention is sufficient for students to meet benchmarks. While most students started out at approximately the same number of phonemes per minute in January, some responded much more quickly to intervention. While one student met benchmark criteria after just 24 sessions of intervention, another made only minimal progress after 36 sessions, still falling within the Deficit range of the DIBELS.

Research Question Number Three
Will students improve their beginning decoding skills as measured by DIBELS Nonsense Word Fluency as a function of participation in the Scott Foresman Early Reading Intervention Program?

As with phoneme acquisition, all students increased their beginning decoding skills as measured by DIBELS NWF as a function of participation in the intervention. Students increased their correct letter sounds per minute in comparison to baseline conditions. They also again outperformed their other kindergarten peers in percentage and actual number of correct letter sounds acquired per minute from January to May, the monitoring period in which the intervention was performed. The data suggests that the Scott Foresman Early Reading Intervention Program is an effective instructional approach for increasing beginning decoding skills.

Research Question Number Four

Will students reach a specified benchmark of early reading decoding skills as measured by DIBELS Nonsense Word Fluency as a function of participation in the Scott Foresman Early Reading Intervention Program?

Of the nine students who participated in the study, three students reached the established DIBELS Spring Kindergarten NWF benchmark of 25 or more letter-sounds per minute. An analysis of the trend of multiple baseline across subjects data indicates that all students were continuing to make progress toward benchmark goals at the conclusion of the intervention. Thus, it is more likely that the length of the intervention rather than the instructional approach is responsible for the students’ failure to meet benchmark criteria.
An analysis of length of intervention required to meet benchmark status for NWF yields no conclusive results. As was the case with the PSF measure, all nine students started with similar NWF scores in January. While two of the three students who met benchmark received twelve weeks or 36 sessions of intervention, the third student who met this criteria received only eight weeks (24 sessions) of intervention. Also, similarly to PSF performance, one student who received twelve weeks of intervention made only minimal progress.

**Research Question Number Five**

Will students make significant gains in word reading and letter identification as measured by the Woodcock-Johnson Psycho-Educational Battery, Third Revision (WJ-III) Letter/Word Identification Test as a function of participation in the Scott Foresman Early Reading Intervention Program?

Observations of students’ and descriptive analysis of data indicate that pre- and post-test scores indicate that the three assumptions of the repeated measures ANOVA (independence of observations, multivariate normality, sphericity) were not violated (Mauchley’s ε=1.0)

Results of the ANOVA indicate that students in the intervention group made significant gains in letter/word identification as measured by the WJ-III (F=6.372, p=045). Post-test scores for the nine students were significantly higher than pre-test scores. Further analysis did not support the presence of significant differences between performances of students by group (F=.187, p=.834). In other words, no group demonstrated gain scores that were significantly different from the other two groups.
The finding that students made significant gains in such a short period of time (between 24 to 36 sessions of intervention) lends further evidence to the efficacy of the Scott Foresman Reading Intervention Program. The predicted power (finding a significant effect when such an effect exists) of the above analysis was low due to the small sample size and stringent alpha level of the analysis. Noteworthy is the large effect size required to obtain statistical significance at the .05 level with such a small sample size.

**Implications of the Study**

Results of the study support the use of intervention programs which 1) focus on key early literacy skills such as phonemic awareness, letter-sound recognition, and beginning decoding skills, 2) utilizes highly explicit instruction to teach these skills and 3) use continuous assessment to monitor progress and make decisions about intervention effectiveness. The combination of the above factors appear to have high utility in improving students’ phonemic awareness skills. Using the guidelines outlined by Good & Kaminski (2001), students who met the PSF benchmark in this study increased their likelihood of becoming an established reader by the end of kindergarten from 18% (based on their performance in January) to 84% (based on May performance).

Gains in the study were noteworthy given the pre-intervention progress of the students in the intervention group. However, it should be noted that the fact that these students gained as many phonemes per minute as their kindergarten peers, those gains are not an indication that these students “caught up” with their classmates as a result of this intervention. The students who participated in this
study had significantly more ground to gain than their classmates. Even students who reached benchmark status in PSF and NWF would likely benefit from continued monitoring and intervention. While the results of this study do not indicate that 24 to 36 sessions of intervention is sufficient to for at-risk students to “catch up” to their peers, it does lend good evidence to the utilization of the Scott Foresman Early Reading Intervention Program as a tool to significantly improve the progress of at-risk readers.

The above results were inconclusive as to what length of intervention is necessary for students to reach benchmarks. While all students started out at approximately the same level, some students evidenced drastic improvement in performance in a short period of time, while others evidenced much smaller skill improvement only after several weeks of intervention. An analysis of possible salient factors which may predict which students will respond most positively to intervention (e.g. history of exposure to print, family history of reading difficulties, overall school performance, cognitive functioning) is beyond the scope of this paper. While individual response to intervention was variable, all students responded positively. An analysis of trend in performance for students who did not respond immediately to the intervention indicates that these students were continuing to make progress. It is predicted that these students would continue to make gains had the intervention continued.

The variability of performance also lends further evidence of the necessity of ongoing performance monitoring of individual students in an effort to determine response to intervention in an effort to determine which students would require
repetition of lessons, and whether or not students should continue to receive individualized intervention.

Implications for Future Research

The findings of this study lead to many additional questions that need to be examined by future research. This section includes suggestions that are warranted given the current study’s findings and limitations.

1. It would be valuable to determine to what extent gains in phonemic awareness and basic decoding skills are maintained after intervention is concluded. While preliminary research (Simmons and Kame’enui, 2001) suggests that intervention gains are maintained, further replication of this study is necessary to corroborate skill level of intervention required to promote skill maintenance.

2. Further research is also needed to predict and monitor students’ response to intervention. While all students started out at approximately the same level, response to intervention was highly variable. Salient factors which predict student response require further investigation.

3. It is yet unknown the extent to which skills gained during the Scott Foresman Reading Intervention Program transfer to authentic reading of connected text. While there is evidence that PSF and NWF scores in kindergarten are highly correlated with other measures of reading in first grade, and while evidence from the initial study is promising for skill transfer in this area, corroborating evidence is necessary to provide further information about intervention efficacy.
3. Studies that compare the Scott Foresman Reading Intervention Program to other instructional approaches that incorporate explicit instruction in phonemic awareness and beginning decoding skills would also be informative.

4. Further research is needed on larger samples of children identified as demonstrating poor phonemic awareness to corroborate the effectiveness of the Scott Foresman Early Reading Intervention Program.

**Conclusions**

The students who received intervention in this study showed significant improvement in phonemic awareness and beginning decoding skills over the course of the intervention. Several factors suggest that these gains were due to the intervention and not to extraneous variables. First, the multiple-baseline design allows for an analysis of trends in performance that strengthens the hypothesis that effects were caused by the implementation of intervention. Since the intervention was implemented for groups of three students at different stages in the study, and the number of phonemes and/or correct letter sounds gained per minute differed significantly from baseline to intervention, other factors that may have caused an increase in these two areas are less probable. Secondly, students who participated in the study increased their rate of improvement on DIBELS assessments to a rate more commensurate with their other kindergarten peers during the intervention. While these students gained phonemes and correct letter sounds per minute at a much slower rate than their peers between September and January before intervention took place, they outperformed their peers in rate and number of phonemes and correct letter sounds gained per minute after they received
intervention. Finally, the statistically significant gains in standard scores on the WJ-III Letter-Word Recognition Test indicates that gains that were made in reading exceeded expected growth based on previous performance.

The above results regarding PSF and NWF scores lend evidence to the need to individualize length of intervention to meet student needs rather than placing students on a set schedule of intervention. Results also support the need to monitor intervention effectiveness frequently throughout the intervention in order to determine which students are making sufficient progress and which students continue to need intervention.

While the progress of students who reached benchmark was encouraging, this is not necessarily evidence that these students would not have continued to benefit from further intervention. The findings of this study are not sufficient evidence that students need only twelve weeks of reading intervention to change their reading trajectory. What the results do support is that relatively great strides in reading skills can be made for many students within a reasonably short time period. The intervention required for the maintenance of these gains is beyond the scope of the current study.

The results of this study indicate that pre-reading kindergartners with poor phonemic awareness skills benefit from interventions such as the Scott Foresman Early Reading Intervention Program which contain highly explicit, small-group instruction in phonemic awareness, letter sound recognition, and beginning decoding skills. Results of this study corroborate previous evidence that early reading difficulties can be prevented to some extent with systematic, intentional instruction
that puts the emphasis of instructional time on concepts that are important to
beginning reading, such as phonemic awareness and the alphabetic principle.
Specifically, results support the initial findings of Simmons & Kame`enui (2002) and
Riempa (2002) which demonstrate the efficacy of the Optimize Intervention
Program, the predecessor to the Scott Foresmen Early Reading Intervention
Program. They further support previous research which advocates the utility of
direct, explicit instruction to teach phonemic awareness (Brennan & Ireson, 1997,
Kozminsky & Kozminsky, 1995, Lundberg et. al, 1988, Wagner et. al, 1993) and the
alphabetic principle (Torgeson, 1997) to improve early reading skills.

Furthermore, results indicate that evaluation of progress for this specific
intervention can be successfully monitored using the DIBELS subtests of Phoneme
Segmentation Fluency and Nonsense Word Fluency. In the context of this study,
DIBELS PSF and NWF is a useful tool for monitoring intervention progress. In
support of the findings of Good & Kaminski (2002) DIBELS was found to be well
suited to measure intervention effectiveness in that administration of PSF and NWF
progress monitoring probes was simple and brief, measures were sensitive to
student growth, and multiple forms allowed for continuous performance monitoring.

The current study is not without limitations. Future research is necessary to
verify the positive effects found from using the Scott Foresman Early Reading
Intervention Program for at-risk pre-readers.

Although much research is needed to expand upon the findings of the current
study, the positive gains evidenced by the students who participated in this
intervention lends additional evidence to the contention that, with the use of early
identification and early, explicit reading intervention, it is possible to prevent rather than remediate reading failure in many children. The large gains in the students who participated in the study in just a short period of time are compelling evidence of the efficacy of such programs.

For many students, the act of reading is not one that comes easily. Despite several myths surrounding the acquisition of reading skills, research gives us clear data about students who have trouble learning to read. Reading does not come naturally for everyone. For many students to become good readers, explicit instruction is required. This instruction must occur early. Waiting for students to “catch up” is not an effective strategy. Prevention of reading difficulties is much more successful than remediation.

Hettleman (2003) puts the reading difficulties of children in perspective. This author writes of the struggle to ensure all children are functional readers:

“The obstacles are formidable. But they pale in contrast to the tens of thousands of …children. . . across the country who will remain permanently left behind if their early reading difficulties are not diagnosed and treated.” (p. 29)

The charge to provide all students ample opportunity to be functional readers requires great effort. Within the context of this study, the combination of the Scott Foresman Intervention Program and the Dynamic Indicators of Basic Early Literacy Skills has high utility in preventing reading difficulties in kindergarten students.
RESOURCES


Simmons, D.C., Kame‘enui, E.J. (in press). A summary of the research findings of Project Optimize: Improving the early literacy skills of kindergartners at-risk for reading difficulties using effective design and delivery principles


Stanovich, K.E., Nathan, R.G., & Vala-Rossi, M. (1986). Developmental changes in the cognitive correlates of reading ability and the developmental lag hypothesis, Reading Research Quarterly, 21,267-283


