CHILDREN AT RISK FOR READING FAILURE IN RURAL SETTINGS:
THE EFFECTIVENESS OF KINDERGARTEN DIAGNOSTICS FOR
PREDICTION OF READING SKILLS

DISSERTATION

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the Degree of Doctor of Philosophy in the Graduate School
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By

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* * * * *

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ABSTRACT

It has been reported that one in five children struggle with reading. High stakes testing and literacy issues are topics of debate and discussion being addressed at the national and local levels. Many school districts are using current research to assist them in making gains and addressing shortcomings outlined by No Child Left Behind. There have been over 60 years of research on early literacy “predictors” at the beginning of kindergarten to prevent reading difficulties and yet reading skills nation wide are still an issue.

Using the data collected over the past three years in a rural school district this study will examine whether utilizing new assessment tools such as Dynamic Indicators of Basic Literacy Skills (DIBELS), increasing time on building reading skills and implementing the three tiered model have an impact on increasing reading skills. Children who began kindergarten in the fall of 2002 were screened with letter naming fluency (LNF) and initial sound fluency (ISF) as prescribed by DIBELS. Oral reading fluency probe scores form the end of second grade for this group of students were compared to second grade students for 2002/03 before the DIBELS screening was in place. In addition, since poverty is thought to be one of the contributing factors for developing reading difficulties, records were examined to determine the percentage of students who were on free or reduced lunch programs and those who

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had access to a preschool program and the impact these factors had on acquiring reading skills. The study also checked for correlations between reading skills and prior preschool experience and gender. NCLB also insist that districts “track” for minorities and special education students and those populations were also included in the study.
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CHAPTER 1
INTRODUCTION

Background

Children from rural areas are at risk for school failure and poorly developed reading skills. One in five children struggle with reading nationwide while our workforce is demanding advanced literacy levels (Foorman, Francis, Beeler, Winikates & Fletcher, 2000). Children’s performance on high stakes testing and the No Child Left Behind Act of 2001 (NCLB) have spurred teachers and administrators to change beginning reading outcomes (Good, et. al., 2002).

In many rural school districts, reading failure is the norm, in part because of lack of home instruction and/or lack of adequate instruction in the classroom (Jimerson, 2000). Children of poverty often lack resources such as books and exposure to printed material. They often have parents that lack literacy skills and do not understand the importance of exposing children to print. Without exposure to print and the opportunity of being read to by their parents, a child’s vocabulary skills are less developed (Shaywitz, 2003). Often these same children enter schools where there is not consistent explicit instruction in the alphabetic principle or in phonemic awareness and by third grade are hopelessly behind same age reading peers.
The importance of learning to read in the early grades and early identification of children at risk is increasingly evident (Foorman, Fletcher, Francis & Schatschneider, 1998). Poor readers at third grade are poor readers at ninth grade. Current research indicates that all children can learn to read (Fletcher, 2005). However, it must be taught with explicit instruction and those at risk need more and sometimes different instruction in addition to regular classroom instruction (Shaywitz, 2003). Failure to read is a matter of skill deficits, which can be remedied with effective and intense intervention. Poor readers, generally, do not “catch up” which is all too evident from current statistics.

Reading “disabilities” or reading difficulty is a significant problem for educators and for society. High stakes testing and literacy issues are topics of discussion and intense debate by local and national committees and politicians. In 1997, congress asked the Director of the National Institute of Child Health and Human Development (NICHD), in consultation with the Secretary of Education to convene a national panel and “assess research based knowledge and the effectiveness of approaches used to teach children to read” (p 1-1, Report of the National Reading Panel, 2000). In 1999 the Panel submitted its findings to congress. In 2002 the No Child Left Behind Act of 2001 was signed. It is described as a landmark in education reform, designed to improve student achievement and change the culture of American schools (www.ed.gov). The act specifically addresses the acquisition of reading skills and presents research on reading disabilities and/or dyslexia.
Acquiring adequate reading skills is also a concern of classroom teachers, parents, and, of course, students. The inability to read well has been studied for many years. As research evolves and more knowledge becomes available, we are better able to understand the process of reading and how the skills are acquired. In spite of this research, children in many rural school districts are continuing to fall far below the expected norm in the area of reading (National Reading Panel, 1999).

The failures of educational systems nationwide are well documented. Many districts are struggling academically and staff and administrators rationalize failure as acceptable, unavoidable and inevitable. Across America one can find schools without the necessary supplies for children, crumbling, antiquated school buildings, inadequate teaching staff and weak administrations which contributes to poor academic outcomes (Jimerson, 2003). The inequities in which funds are dispensed within a school district also deem many districts to failure. Wherever there are concentrations of poor people and low employment, public education is often found to be inadequate. With shrinking budgets and increasing standards, major challenges face schools today (Roellke, 2003).

Mandates are putting increasing pressures on educators to demonstrate that federal and state dollars for student improvement are being utilized in appropriate ways (Roelke, 2003). This has resulted in political leaders at federal and state levels enacting and pushing for stronger legislation and regulations to close the gaps between literacy and reading failure as well as other skill levels in other academic areas. *The No Child Left Behind Act* was passed by the U.S. congress in 2002. This
act calls on states to close the achievement gaps among all groups within the next 12 years or at least make substantial progress. One way that school districts can address this issue is by adequately screening children as they begin kindergarten and adopting a model such as, the three tiered model (Reschley, 2003) to prevent reading failure.

More attention is being focused on the development of screening tools to assist in the early identification of reading difficulties in children. It is imperative that the screening tools accurately distinguish individuals that require intervention from those that do not (Jenkins, 2003). There are a number of effective screeners. Good, Simmons and Kame’enui (2001) have developed a screening/progress monitoring tool for grades K-2, DIBELS (Dynamic Indicators of Basic Early Literacy Skills). Foorman, Fletcher, Francis, Carlson, Chen and Mouzaki (1998) developed the Texas Primary Reading Inventory (TPRI), which also screens and has skill profiles. Both are evidenced based screeners. However, many schools continue to rely on kindergarten screenings that focus on perceptual, motor skills and receptive/expressive language, which have been found to be a less predictive indicator of how difficult it will be for a child to learn to read (Schatshneider, et al, 2004).
Reading Failure

Current research indicates that pre-reading and reading skills must be introduced earlier than previously indicated and children need more time on task to overcome the gaps in reading. Emphasis on preschool programs and early elementary is believed to be the key to preventing reading failure (www.naesp.org,).

Reading is a learned task so it is imperative that the foundations be in place early to prevent the development of reading difficulties and/or Dyslexia, a word reading disorder (Shaywitz, 2003). Another approach is to encourage preschool programs such as Head Start, developmental preschools as well as private preschools to introduce literacy skills focusing on concepts of print, story book reading, phonemic awareness, simple rhyming, vocabulary and letter identification. It is also recommended that young children be actively engaged in language-rich conversation.

Reading risk can be identified in preschool and kindergarten through measures of phonemic awareness and letter knowledge (Kaminski & Good, 1998; National Reading Counsel, 1998; Stanovich, 2000). DIBELS (Dynamic Indicators of Basic Early Literacy Skills) and other brief screening tools are promoted as excellent indicators of future reading difficulties. DIBELS is a research-based screening tool that assesses phonological awareness and initial sound fluency (Kaminski & Good, 1998). It was designed as a brief measure for progress monitoring and early identification of children with reading problems conceptualized
as extensions of curriculum based measures or (CBM) oral reading fluency probes. It evaluates early literacy skills identified in literature as related to successful later reading competency (Elliott, Lee, & Tollefson, 2001). Shaywitz (2003) also mentions several other early assessment tools, including the Texas Primary Reading Inventory (TPRI, which can be found at www.tpri.org), and the Phonological Awareness Literacy Screening (PALS) at http://curry.edschool.virginia.edu/go/pals/).

Reading development follows a series of predictable stages so screening tools must be sensitive to these stages and skill levels. Important building blocks for reading development at the kindergarten level are phonemic awareness, letter knowledge, grapho-phonemic knowledge and vocabulary. At first grade these continue to develop but the greatest growth comes in the area of phonemic spelling, decoding, word identification and text reading. Second and third grade skill development shifts to types and numbers of words read and fluency. As grade levels increase, the focus shifts to comprehension. Kindergarten students who are deemed at risk are a red flag to teachers that the students have not developed literacy knowledge at home or at preschool. These children need more and possibly different instruction than the rest of the class.

The three tiered model or Response to Intervention model (RTI) is being proposed as an alternative to “wait to fail” model that is associated with the current discrepancy model used by most states for identification of specific learning disabilities (Reschly, Hosp & Schmied, 2003). The discrepancy model compares overall cognitive ability (IQ) to achievement. Until recently, in the state of Ohio,
there needed to be a discrepancy, ideally 30 points between IQ and one area of achievement, for the child to be considered to have a specific learning disability. A child with an average IQ of 100 would have to score 70 or below to qualify for special education services (average score is considered 90-109). The most devastating criticism of the discrepancy model is that treatment is delayed until later grades and the child gets further behind same age peers and effective intervention becomes increasingly difficult (Fletcher, et al, 1998).

**Purpose of the Study**

Many school districts are using research based approaches to assist them in making gains and addressing short comings outlined by No Child Left Behind. Using archival data collected over the past three years in a rural school district this study will examine whether the use of DIBELS is a valid predictor of future reading skills. Children who were assessed during the beginning of kindergarten with DIBELS in 2002 and assessed with the Ohio Education Department second grade reading diagnostics in 2005 will be compared to all second grade students in 2002/03 that were not screened in kindergarten. All children who entered kindergarten in 2002/03 were assessed with DIBELS and those scoring in the intensive or at-risk categories were given increasing time on building reading skills. In addition, since poverty is thought to be one of the contributing factors for developing reading difficulties, records will be examined to determine the percentage of students who were on free or reduced lunch programs and those who had access to a preschool
program and the relationship these factors had on acquiring reading skills. NCLB also dictates that districts “track” for minorities and special education students and those populations were also included in the study.

**Research Questions**

1. Is there a difference in the percentage of the students who met the district benchmarks for oral reading fluency (wpm) in 2003 and 2005 after a systematic district-wide procedure was implemented?

2. Is there a difference in the percentage of students meeting the benchmark between 2003 and 2005 and does the difference vary according to school of attendance in kindergarten?

3. Is there a difference between the percentage of students who met the benchmark for comprehension and does the difference vary according to the school of attendance in kindergarten?

4. Is there a difference in the mean oral reading fluency scores (wpm) between 2003 and 2005 after a systematic district-wide procedure was implemented?
5. Does the difference in the mean oral reading fluency scores (wpm) vary by school of attendance in kindergarten?

6. Does letter naming fluency (LNF) and initial sound fluency (ISF) at the beginning of kindergarten predict second grade oral reading fluency (wpm) and comprehension?

7. What is the difference between students who received a preschool experience and those who did not on initial LNF, ISF scores and second grade diagnostic reading scores (oral reading fluency probes and comprehension)?

8. What is the difference between students who were on a lunch subsidy and those who were not on initial LNF, ISF scores and second grade diagnostic reading scores (oral reading fluency probes and comprehension)?

9. What is the difference between males and females on initial LNF, ISF scores and second grade diagnostic reading scores (oral reading fluency probes and comprehension)?

10. Is there a difference in the proportion of students referred to special education before and after a systematic procedure was implemented?
CHAPTER 2
REVIEW OF LITERATURE

Introduction

Americans rely on public education to prepare over 50 million students to become productive members of society (Miller, 2002). By law children must attend school. This results in public schools becoming the only mandated institutions that provide for the needs of poor children and they cannot turn children away regardless of race, religion, immigration status or other identifying characteristics. Schools are actually the safety net for poor children (Noguera, 2003). Of that 50 million children, many live in urban and rural settings that have distinct and significant challenges. Reading is essential for success in our society; it is highly valued and important for social and economic advancement (National Research Council, 1998). A technological society demands ever increasing levels of literacy. Research indicates children living in urban and rural settings are at greater risk for reading failure (National Research Council, 1998).

To address the issues related to reading failure, congress convened a National Reading Panel in 1997 to assess the status of research-based knowledge and the effectiveness of various approaches to teaching children to read (p 1-1, Report of the National Reading Panel, 2000). The panel received information from 125
individuals or organizations that represented key players - teachers, parents, students, university faculty, educational policy experts and scientists. Several key themes were expressed repeatedly:

- The importance of the role of the parents in providing children with early language and literacy experiences that foster reading development.

- The importance of early identification and intervention for all children at risk for reading failure.

- The importance of phonemic awareness, phonics and good literature in reading instruction and the need to develop a clear understanding of how best to integrate different reading approaches to enhance the effectiveness of instruction for all students.

- The need for clear and objective scientific-based information on the effectiveness of reading instruction and the need to have such research inform policy and practice.

- The importance of applying the highest standards of scientific evidence to the research review process so the conclusions and determinations are based on findings obtained from experimental studies characterized by methodological rigor with demonstrated reliability, validity, replicability and applicability.
• The importance of the role of teachers, their professional
development, their interactions and collaboration with researchers
which should be recognized and encouraged.

• The importance of widely disseminating the information that is
developed by the panel.

Previously the National Research Council had published *Preventing Reading Difficulties in Young Children* in 1998. The council indicated it is critical that all children be provided with excellent reading instruction and high-quality preschool and kindergartens that have well prepared and highly knowledgeable teachers. The council also found it critical to identify struggling children early and provide them with appropriate intervention. They reported three potential stumbling blocks that interfere with reading acquisition; difficulty understanding the alphabetic principle, failure to transfer the comprehension skills of spoken language to reading and the failure to value or develop a mature appreciation for the rewards of reading.

The National Reading Panel indicated that 44% of all third grade children do not meet the benchmarks for reading. The National Assessment of Educational Progress (NAEP) conducted a survey in 1998 and found that 69% of fourth grade students nationwide read below grade level. In addition, 78% of eighth grade students whose parents had a high school education read below proficiency levels. According to NAEP data, 38% of fourth grade students had not met basic or rudimentary reading skills. That same year the National Research Council concluded that 25-40% of all American children do not read well enough, quickly
enough or easily enough and as a result their reading skills were considered impaired. This percentage is much greater for rural and urban settings and can exceed 85% in urban African American communities. Fletcher (2004) reported that there are over five million children in the United States today who can not read and that 80-90% of all children identified as learning disabled are impaired in reading. However, he stressed that with early identification and appropriate intervention, the number of at risk readers currently estimated as the bottom 20%, could be reduced and referrals to special education could drop to less than 2% of the population.

No Child Left Behind (NCLB) took information from current research and applied it to all public school districts in all states. The mandate directs all schools to assess 95% of all enrolled children and track results by gender, racial/ethnic groups, English Language Learners, migrant status, students with disabilities, and those economically disadvantaged. There are five key features outlined for educators in NCLB:

- All students are to be included in academic assessment activities to determine their achievement levels which are reported to the public.

- All students are expected to improve academically.

- Educators must use scientifically-based curriculum, instructional and assessment practices to enhance educational outcomes.

- Schools are to provide safe environments where learning is supported.

- Highly qualified staff provides instructional services.
• Parents have expanded choices in determining the school for their child if a school does not meet standards.

The No Child Left Behind Act also reported several factors for success in reading. Children must learn language and pre-reading skills before entering kindergarten. Preschoolers should understand that print reads left to right and top to bottom. Further research indicates that preschool and early childhood experiences are essential for children to become good readers (NRP, 2000). A recent report by the National Association of Elementary School Principals (www.naesp.org) advocated bringing preschool experiences in line with kindergarten expectations. A guide was designed to assist elementary school principals in implementing and/or assisting preschools in developing sound programs that include recent research on brain development and how the brain learns. The report identified six standards for early childhood learning communities.

• Embrace quality early childhood programs, principles and practices as the foundation for education throughout the school community.

• Engage families and community organizations to support children at home, in the community and pre-k and kindergarten programs.

• Provide appropriate learning environments for young children.

• Ensure quality curriculum and instructional practices that foster young children’s learning and development in all areas.

• Use multiple assessments to strengthen student learning and improve the quality of programs.
• Advocate for universal opportunity for children to attend high-quality early childhood education programs.

Children with a strong foundation developed in preschool must continue to have good instruction throughout the elementary years to prevent most reading difficulties (Snow, et al, 1998). Research is clear that slow readers and/or children with reading difficulties need more time immersed in language and reading not less time. Learning to read involves everyday encounters with words the child has never before seen in print (Torgesen, 2004). Without adequate exposure to print and quality instruction in reading, some children never learn to read or read very poorly. However, it is estimated that 3-5% of all children may only attain reading skills at the functional level (Fletcher, 2005). Fletcher also stated that adults can go through life with a functional reading level, the equivalent to fourth grade reading skills but today’s technological workplace demands increasing levels of literacy.

The results of the National Reading Panel, the National Research Council and No Child Left Behind legislation generated an additional five years of research on evidence-based methods that work. That research supported the use of screening tools to effectively identify those children at-risk for reading difficulty early and then providing intense, explicit and flexible instruction for struggling readers. The challenge remained: to evolutionize education into a truly empirical grounded profession (Miller, 2002).
**Current Research on Reading**

Research has indicated time and again that it is often the reality that poor readers do not get better. As children progress through school and have less reading instruction, some skill levels often regress. Stanovich (1986) referred to this as the Matthew effect: the rich get richer and the poor get poorer. Applying this to reading, we know that fluent readers become better readers and struggling readers continue to struggle (Joseph 2002). Some struggling readers never improve and many lose the skills that they had acquired in the past, while their fluently reading peers continue to improve and learn to read for enjoyment. It is not unusual to find the skills of struggling readers at or below where they were at the last evaluation or assessment. Shaywitz (2003) reported that in a longitudinal study she conducted, most struggling readers were getting a “band-aid for a gushing wound”. Assistance was given inconsistently, for very limited periods of time, by well meaning people using methods that did not reflect evidence-based instructional strategies. Research indicates that phonemic awareness must be taught systematically, explicitly and intensely. As recommended, children should be screened when entering kindergarten and their progress tracked (Reschley, Hosp & Schmied, 2003). Differentiated learning should be implemented by forming flexible groups with consistent progress monitoring. Struggling readers should be in groups of two to three and should receive more instruction at a time different from classroom based reading instruction. Struggling readers should not be retained but should progress
with their peers. Poor reading ability does not get better with additional time but only with additional time on task coupled with intense, explicit instruction.

The majority of children, 75-80%, will learn to read no matter what curriculum or presentation is used (Shaywitz, 2003). But all children must build the neural circuitry that links the sounds of the spoken word (attending to the sounds). Phonemic awareness instruction for fifteen minutes a day should begin in preschool or kindergarten by rhyming, pulling apart words or pushing them together. The child must “play” with sounds; the use of repeating nursery rhymes and jingles is helpful. Then instruction can progress to blending sounds and segmenting words. Once there is success with matching sounds, the child can begin to pull words apart. Incorporating kinesthetic activity such as clapping or stomping out the sounds in unison as a class is also beneficial. It not only reinforces the circuitry recognizing sounds but keeps the attention level high.

It is evident from the current research that to become a good reader, one must read. As a child becomes proficient at decoding and reading words, different kinds of information become linked together in the neural circuitry (Shaywitz, 2003). Once the word is registered, the spelling, the pronunciation and its meaning are immediately understood, resulting in increased vocabulary and comprehension skills. However, this only comes by practice, reading words over and over again. The more a child is engaged in reading the easier and more fluently, he/she reads. This increases the likelihood the child will learn to enjoy reading and read for pleasure. A child who reads for pleasure and enjoys reading becomes a skilled reader that
understands what they read. Shaywitz (2003) reported that the best readers (>90th percentile) read more than 20 minutes a day (about 1.8 million words a year). Those at the 50th percentile read 4.6 minutes a day (282,000 words a year). The poorest readers, those below the 10th percentile, read less than one minute a day; which results in only 8,000 words a year. Thus, making it essential that reading difficulties be addressed as early as possible, with proper diagnosis and effective treatment.

According to Sousa (2001), reading is one of the most difficult activities learned. Reading does seem to come naturally for many children but for others, estimated at 20%, it requires intense teaching. Sousa (2001) stated that it is remarkable that the brain learns to read at all. The brain has to sort through all kinds of conflicting and confusing input and establish patterns and systems. First, the brain must learn the alphabet and then connect letters into phonemes it has already been using since learning to talk. Finally, one must remember that letters are symbols that can make more than one sound, and groups of letters can have different sounds. Although it appears this is a linear and singular process, current research indicates it is bidirectional and parallel with many phonemes being processed at the same time.

Research indicates that the infant brain is pre-wired for spoken language acquisition and it can learn all of the languages on the planet (Sousa, 2001). All children speak except those born with profound hearing loss; nevertheless, even children who are deaf develop language skills. The brain is “primed” for language. It follows a biological progression and will adapt to any language to which it has been exposed (Pinker, 1994). The brain’s ability to acquire spoken language with
great speed and accuracy is the result of genetic hard-wiring and specialized cerebral areas that focus on the task (Sousa, 2001). However, reading has to be learned. Reading is a relatively new task that humans have developed. Until recently, there was no evidence indicating that genes have incorporated reading into coded structures. It is thought this may be due to the fact that reading is not needed for survival, as there are cultures that do not read.

However, there is recent research that has identified genes associated with reading and dyslexia. At a meeting of the American Society of Human Genetics in October 2005, it was indicated that dyslexia has a genetic link (www.wrightslaw.com). The genes are preferentially expressed in areas of the brain known to participate in reading. A gene on chromosome 6 called DCDC2 leads to disruption in the formation of brain circuitry that makes it possible to read (Gruen, 2005). The gene modulates migration of neurons necessary for normal reading. Fluent readers and those with dyslexia have the protein made by this gene but it is less abundant in the brains of those diagnosed with dyslexia. It is not yet known what function the protein has according to Gruen (2005). Gruen stressed the need for schools to tailor programs to fit the needs of the child. Dr. Kere (www.ospaonline.org) a professor at Karolinska Institute in Stockholm, reported with reduced gene activity less dendrites or connections were made. The report also emphasized that this is not a reading gene but a gene that supports the circuitry underlying acquisition of reading skills.
Sousa (2001) stated that the reading process starts when the word is recorded in the brain. Decoding occurs in the left hemisphere where separation of sounds occurs, then words have to be identified and finally meaning has to be assigned to the word. A problem along the way will slow or disrupt the process. “Poor” readers have higher levels of activation in the frontal lobe areas than good readers due to their increased additional effort in decoding and possibly due to subvocalizing. Children who have not mastered phonemic awareness read painfully slow and labor over every word. This increased attention to every sound and letter leaves little cognitive awareness of the word read and subsequently little comprehension is attained.

Shaywitz, (2003) has conducted functional imaging studies that focus on the neural circuitry for reading for the past decade. She not only found a difference in how the brain reads in adult males and females but found significant differences in brain activation between good readers and poor readers. Imaging studies indicate that there are two neural pathways for reading; one for beginning readers and another speedier pathway for skilled readers. Beginning readers must analyze each word while skilled readers identify words instantaneously. It is also hypothesized that there is a third neural pathway that aids in the slow decoding or analyzing of words.

It appears that dyslexic readers have a fault in the system, a neural signature, making it difficult to analyze words and transform letters into sounds. Without intervention, as children with dyslexia mature, they remain slow laborious readers. Slow readers often have a compensation style of reading that includes
subvocalization. This neural signature for phonological difficulties appears to be universal and is true of dyslexics of all languages and ages. Shaywitz (2003) states that even high achieving university students with a history of reading difficulties and this neural signature continue to read slowly.

Dyslexic children also develop alternate secondary pathways that are not a repair but a different route. They activate areas of the right hemisphere. This helps them become accurate readers but they still continue to read slowly. It is like manual reading versus automatic. The use of the right hemisphere to read also locks up other functions that are normal for the right hemisphere. However, when poor readers were given a year in an intense reading program, the fMRI patterns revealed these children no longer had the pattern associated with poor reading. This information reinforces the importance of intervening early when children are struggling with reading.

**Promising Research**

So what can schools, including those in rural districts do to close the gaps? At the Response to Intervention Symposium, December 4-5, 2003 in Kansas City, Missouri the possibility to make change was presented. This symposium was a collaborative project by the National Research Center on Learning Disabilities (NRCLD) and the Office of Special Education Programs with staff at Vanderbilt University and The University of Kansas. Presenters offered current research on the
response to intervention model, feasibilities and consequences, and shared information on projects initiated by NRCLD.

NRCLD is working with six regional districts to implement change and develop the effectiveness and feasibility of RtI. The council invited top researchers in reading and response to intervention (RtI) to participate. The question was not how to make changes in rural and urban schools but revolved around the identification of children with specific learning disabilities and how RtI could prevent identification by providing intervention early. Information provided offers promise to all children who struggle to read. It is a problem-solving model and focuses on response to interventions and a three-tiered approach to intervention. One central issue, children at risk for reading difficulties can be identified at kindergarten or before and if the appropriate, explicit, intense intervention is implemented early; children will learn to read within the average range (Reschly, Hosp & Schmied, 2003).

The three tiered model or RtI is being proposed as an alternative to the “wait to fail” model that is associated with the current discrepancy model for specific learning disabilities (Reschly, Hosp & Schmied, 2003). With the passage of Individuals with Disabilities Education Act (IDEA), educators developed criteria to determine qualification for special education. For learning disabilities, including dyslexia, a discrepancy formula was developed. This discrepancy model used by most states to identify students with learning disabilities requires a two standard deviation score between cognitive ability (IQ) and achievement or academic
performance. This has resulted in the belief that it is a waste of time to refer kindergarten or first grade children for poor reading. A reading disability will not “show up” before a child is in third or fourth grade because only then will the child reach the cut-off point to meet the criteria. This has lead to the mistaken notion by many school personnel that reading disabilities or dyslexia cannot be identified until the child has reached at least third grade. It is true that it is very difficult to identify struggling readers with the discrepancy model until they are much older, and some do not develop a significant discrepancy until middle school when remediation is extremely difficult. The researchers indicated it is possible, using screening tools, to predict children who will need extra support in reading as early as the beginning of kindergarten. Actually, most children have the necessary language basics to begin sound/letter association at age three (Fletcher, 2004).

The first tier of the model prescribes that all children participate in the general education curriculum and are screened for readiness skills or grade level skills. It is also key that the curriculum is evidenced based and district wide. Approximately 80% of all children will do well in this setting. Those at risk after the screening are offered some additional instruction. This may be small group within the classroom, Title I services, tutoring, etc. This is the second tier of intervention. If children continue to perform below benchmarks then referral to the Intervention Assistance Team (IAT) or other professionals is initiated. This team will assist those working with the child in determining interventions. Answering the question, does the child need more exposure to what is already in place or does the child need
something different? Only after these three steps are tried and the child is unresponsive to the intervention is a placement in special education considered.

It is imperative that the screening tools accurately distinguish individuals that require intervention from those that do not (Jenkins, 2003). Good, Simmons and Kame’enui (2001) have developed a screening/progress monitoring tool for grades K-2, DIBELS (Dynamic Indicators of Basic Early Literacy Skills). Foorman, Fletcher, Francis, Carlson, Chen and Mouzaki (1998) developed the Texas Primary Reading Inventory (TPRI) which also screens and has skill profiles. Both are evidenced based screeners. Research has indicated that screening of perceptual, motor skills and receptive/expressive language are not good indicators of how difficult it will be for a child to learn to read (Schatschneider, et. al., 2004).

There are not many published studies that have attempted to validate whether these early screening instruments actually are valid predictors of later reading ability. A study by Elliot, Lee & Tollefson (2001) used a modified form of DIBELS with 75 kindergarten students. They utilized four of the DIBELS measures, Letter Naming Fluency (LNF), Sound Naming Fluency (SNF), Initial Phoneme Ability (IPA) and Phonemic Segmentation Ability (PSA) to identify those students who were at risk. Their study was an extension of work by Good that evaluated DIBELS on a nationally representative group of kindergarten students. The study concluded that there was support for LNF, PSA and SNF but IPA was weak in predictive ability. Validity estimates were weaker than the original studies by Good, et. al.(1992). The study indicated a weakness in instrumentation and a need for improved training and
administrative procedures. Most measures are very brief (i.e. about 30-60 seconds) and examiners must make quick decisions concerning accuracy. It was reported that the quick and easy use may encourage kindergarten teachers to emphasize pre-literacy skills and incorporate opportunities for the practice of the sound symbol relationships and the development of phonological awareness.

A 2003 study (Hintze, Ryan & Stoner) examined the validity and diagnostic accuracy of DIBELS with the CTOPP (Comprehensive Test of Phonological Processing). The purpose of the study was to determine to what degree DIBELS correlated with another standardized measure of prereading skills (CTOPP). They reported that recent studies have shown that proficiency in phonological awareness skills is highly predictive of reading readiness skills. Adams (1990) and Stanovich (1986) suggested that struggling early readers have a poor learning curve unless there is timely intervention. Early intervention is critical to reading success but educators need reliable instruments to guide intervention and identification. Hintze (2003) indicated it is imperative that if we are to use DIBELS for resource allocation, placement and identification, the measure should differentiate accurately between children who do not have the skills and those who do have the skills.

The results indicated that Initial Sound Fluency (ISF) did not accurately predict who would have a problem on the CTOPP but it was high for the probability to predict who would not have a problem on the CTOPP. It also found that the overall ability of ISF to accurately predict a student’s correct classification using the suggested cut scores was no better than chance. They found similar results for
phoneme segmentation fluency (PSF) tasks. The researchers suggested that if schools were to choose to use ISF and PSF to make decisions about resource allocations and entitlement lower cut scores should be used. There was strong evidence that the DIBELS measured similar constructs as the CTOPP. However, using the recommended cut scores for ISF and PSF resulted in high sensitivity in identifying children with low phonological awareness skills (i.e. true positives), as well as children who did not perform poorly on the CTOPP (i.e. false positives). Using the DIBELS cut scores could then result in the unnecessary allocation of resources to children who have been identified as “at-risk” for early reading problems. They recommended that the use of DIBELS as a classification tool be used with caution and it should be limited to screening until further research could be conducted.

Another study (Schatshneider, et al., 2004) assessed the relative importance of using multiple measures on a kindergarten sample to predict 1st and 2nd grade reading outcomes. While acknowledging the interest in early identification of children at risk for reading failure and the need for prevention, it is difficult to decide which variables are the best predictors. They cited Scarborough (1998) who indicated that measures of phonological awareness might lack the sensitivity for identifying children at risk for reading failure because they produce both false negative and false positive identifications. The results of the study indicated that phonological awareness, RAN (Rapid Automitized Naming) letters and knowledge of letter sounds is most predictive. Letter naming became less predictive by the end
of kindergarten. The study hypothesized that vocabulary and expressive/receptive language measures would be the best predictors of reading comprehension and comparable to phonemic awareness in predictability, but this was not supported by this study. Measures of perceptual skills were not significant after controlling for phonological awareness.

In a review of outcomes (Good, et al., 2002), there was support for the use of DIBELS as part of an outcomes driven model that emphasized prevention and preempting early reading difficulties. They recommended that children who scored below 4 or below the 20th percentile on ISF and children who scored a 2 or below the 20th percentile on LNF would be a child at considerable risk for difficulty learning to read. They indicated the fundamental purpose of DIBELS was to provide an assessment at the beginning of kindergarten to identify children in need of additional intervention. They also concluded that children who achieve middle of kindergarten goals for ASF, PSF and LNF are unlikely to experience severe difficulty with phonemic awareness skills at the end of kindergarten. It was also suggested that poor outcomes may be the result of inadequate curriculum and instruction, a lack of emphasis on phonemic awareness and the integrity of DIBELS may have been compromised.

Reading development follows a series of predictable stages so screening tools must be sensitive to these stages and skill levels. Important building blocks for reading development at the kindergarten level are phonemic awareness, letter knowledge, grapho-phonemic knowledge and vocabulary. At first grade, these
continue to develop but the greatest growth comes in the area of phonemic spelling, decoding, word identification and text reading. Second and third grade reading development shifts to types and numbers of words read and fluency. As grade levels increase, the focus shifts to comprehension. Kindergarten students deemed at risk are a red flag to teachers that the students have not developed literacy knowledge at home or at preschool. These children need more and possibly different instruction than the rest of the class.

Several large-scale studies have been conducted to implement new research findings and recommendations. A study of 1,200 first and second grade students in Texas found that instruction should be based on what the child already knows. Instead of, “Is this child fluent?” the question should be “On what words is the child fluent?” This project used Project Read (Enfield & Greene, 1998) or Open Court (SRA, 2000) with Language Arts blocks of 1.5 hours at one of the elementary schools. At another inner-city school that was 94% African American, the instructional program was Reading Mastery (Engelmann & Bruner, 1995) in two-hour blocks. At another elementary that was 72% Spanish speaking, the students had 90 minutes of instruction with Success for All (Slavin, Madden, Dolan & Wasik, 1996); see www.successforall.net. A fourth school used a variety of programs including the Lindamood Phoneme Sequencing Program (LiPS; Lindamood & Lindamood, 1998).

The commonality of these schools included: strong instructional leadership and accountability, knowledgeable teachers, ongoing professional development,
increased time allotted for reading instruction, targeted differentiated instruction and
tiers of reading interventions informed by ongoing assessment. In these four
schools, few students are in special education. The special education population
consists of children with disabilities that are developmental, physical or medical in
nature. Screening integrated with ongoing assessment of the core reading instruction
was essential (Foorman, 2003).

O’Connor (2000) implemented four levels of reading intervention. At the
beginning of kindergarten, students were provided with an evidenced-based, whole-
class, phonological awareness program implemented by the general education
teachers. Unresponsive students received one-on-one tutoring from assistants. In
first grade, those still not making adequate progress received small group instruction
from their classroom teachers and then, one-on-one tutoring from a researcher. His
findings suggest that some poor readers benefit from classroom instruction while
others needed intense, individualized instruction.

Another study in eight metropolitan Nashville schools was conducted from
October 2000 to April 2001 by Fuchs, et al., (2001). Students were screened with
the Rapid Letter Naming test; those at risk and average performing students were
tracked through the use of oral reading fluency probes from DIBELS (Good,
Simmons and Kame’enui, 2001) and Dolch words that were consistent with pre-
primer, primer and first-grade-level words. After seven weeks, students were
regrouped according to their response to the instruction. Students worked on
materials that matched their skill levels and the students who did not make adequate
progress made adequate gains once small group or one-on-one instruction was introduced. The researchers suggested further studies to assess the appropriate group size for reading instruction, and whether groups instructed by aides, paraprofessionals and/or parents would be as beneficial as instruction with a certified teacher. Intense “special-education-like” instruction for brief periods of time may be the best response to children most at risk for reading failure (McMaster, Fuchs, Fuchs, and Compton, 2003).

Grimes & Kurns (2003) utilized a multiple tier process or problem solving process. The problem was defined, a plan was developed, the plan was implemented, effectiveness was evaluated and the process was repeated as needed. The Heartland Area Education Agency in Iowa, one of the few studies conducted in a rural area, implemented a four-tier model with the fourth tier being special education services. It was a school-wide effort with needs identified as benchmark, strategic or intensive. Cornell Elementary School is in a small school district in central Iowa housing 375 K-3 students. Forty-five percent of these students were on free or reduced lunch. Children were screened with DIBELS three times per year. A continuum of interventions was implemented including Road to the Code, OPTIMIZE, Peer Assisted Learning Strategies, Reading Mastery, Quick Reads, Phonic to Reading and Comprehensive Intervention Guides from Open Court. Seventy-one students received intervention and only two went on to be identified as needing special education services.
Grimes & Kurns (2003) stressed that the model is not business as usual nor is it adding another intervention but it takes commitment to an intervention-oriented service system. Strong leadership is essential, with clear expectations outlined (job descriptions modified to include direct assessment linked to intervention and support for each student). Paper work must be revised. Data collection standards must be clear and implemented district-wide. It was found that when the problem-solving model is used school wide, it leads to early identification and intervention for students at-risk for school failure.

Commonalities in these studies were strong in instructional leadership and accountability; knowledgeable teachers; ongoing professional development; increased time allotted for reading instruction; targeted differentiated instruction; and tiers of reading interventions informed by ongoing assessment. Screening integrated with ongoing assessment of the core reading instruction was essential (Foorman, 2003). O’Conner (2000) stated that staff must be committed to an intervention-oriented service system for it to be beneficial. In addition, strong leadership is essential, with clear expectations outlined (Grimes & Kurns, 2003).

Although this approach seems to be “common sense” and few would disagree with the need to provide evidence-based, intense, explicit instruction to children at risk, there are difficulties (Mastropieri, 2003). How do we insure that educators adopt these procedures? There are concerns the process is ambiguous, operationalizing it is difficult and interpretation of Tier I, II and III may vary by district or among schools. It could vary even more from state to state and between
suburban, urban and rural schools. Successful schools, even those from poverty areas, seem to have a common mission that is approached enthusiastically by all involved, teachers, students and parents.

**Culture of Rural Schools**

As stated, the key ingredients that successful schools seemed to have are: strong administrators, involved educated parents, money for current evidenced-based curriculums, access to tutors and aides in the classrooms; just to name a few. There is a confounding factor that suburban and affluent areas have: middle-class families that can provide summer camps, enrichment programs, music lessons, and travel. These parents approach their child’s school with the know how to make the system work for them and the resources to provide what the schools lacks, often called cultural capital. However, much of these resources are not available to rural parents and their children (Jimerson, 2003). In many households, parents or caregivers may not be able to read the bulletins on magnet schools, programs and opportunities mailed out from these schools even if the district has the money for such opportunities. In addition, many parents would prefer the local school or neighborhood school, even though it may be one of the worst in the district (Noguera, 2003). This is also true in rural areas that offer open enrollments to intra-district schools or even countywide inter-district schools. Parents with little resources and transportation difficulties will opt to keep their children at the local school.
What is the face of rural schools? A search generated only one book on rural populations and little written about rural schools in general. Rural populations are often considered “invisible” (Carter, 1999) because their difficulties often do no gain the media attention like urban city schools. However, in Why Rural Matters (2003), Elizabeth Beeson reports that one in three children attend a rural school in an area or town of less than 25,000 people. One can find specific population groups in literature, such as Native American populations or studies related to Appalachia or the Black Belt of the south. There is no consistent data to compare whether rural schools educate children as well as urban or suburban areas.

There are 535 areas considered rural persistent poverty (RPP). RPP consists of communities in Appalachia, slave and sharecropper economies of the old South, migrant agricultural communities and scattered Native American reservations (Carter, 1999). These areas are socially stratified, have low performing education systems and low expectations for students from these poor families. Schools are asked to prepare students for non-existent jobs, and resources are often controlled by outsiders or locals who rely on cheap labor forces (Jimerson, 2003).

NCLB has policies to benefit rural and small schools called “Rural-Sensitive Best Practice”. Implementation provisions and timelines are particularly challenging for rural and small districts (Jimerson, 2004). She also reports that NCLB is a suburban/urban law and is insensitive to the needs of rural schools. It defines rural schools as small, often poor, with large concentrates of minority children and financially distressed districts due to declining tax bases and failed new tax levies.
At one time, many of the rural areas had communities with thriving agriculture and small businesses that served the community and had many community-led activities that took care of “their own,” including the poor (Jimerson, 2003). However, society has changed and those towns and villages are shells with boarded up buildings and they now often lack even grocery stores. With the loss of businesses and small farm families, schools have become more dependent on the state for funds to run their schools. States are faced with less money for rural schools because of inadequate funding formulas, most based on property taxes (Noguera, 2003). With less money, rural schools offer teachers lower salaries so it is difficult to recruit highly qualified teachers. This also results in school buildings that are antiquated and in poor repair. Rural schools also have decreasing enrollments, which places more burdens on the local community. Many rural schools are in remote areas, only increasing the problems of attracting and retaining educators, meeting state and federal requirements and for offering quality professional staff development (Jimerson, 2003).

In addition, rural schools are often controlled by local governing systems rooted in the area’s culture. Rural communities have strong connections with their schools and make many of the decisions (Jimerson, 2003). NCLB has little impact on these schools and local populations resist federal and state “interference” and look suspiciously at mandates. Increasingly, the face of the population is older, less educated and poorer, with young educated residents moving where there are jobs and the upwardly mobile lifestyle (Carter, 1999).
In many areas, schools in rural settings are facing declining numbers. The movement of jobs, resources, and people from rural areas to follow jobs and the suburbs forces districts to close buildings and consolidate students, which results in crowding existing classrooms. Some rural areas have consolidated to a central campus school, which may or may not reflect the needs of the entire county (Haas, 2000).

The inequities in which funds are dispensed contribute to failure for rural and urban schools because tax bases are declining (Haas, 1999). States are faced with less money for rural and urban schools because of inadequate funding formulas but find ways to increase funds for the ever-expanding prison system that absorbs those who have failed elsewhere (Noguera, 2003). In addition, many rural and urban districts have what sociologists call “no zones” economically depressed, isolated areas with no community services, no banks or stores and no functional economy unless it is illegal.

Rural education increasingly has the face of “color”. African Americans, Latinos and Native Americans have lower educational performance in comparison to non-Hispanic Whites and Asian Americans (Miller, 2003). Both urban and rural school districts are often defined as poor, with large concentrates of minority children and districts that are financially distressed. Overall, 42% of school-age children are eligible to receive free lunches and 40% attend schools considered to be high-poverty schools. Rural schools often have a higher proportion of children in special education. Students are often identified as “low-ability”, tracked in low
expectation, remediation or special education settings. In high school, they are encouraged towards vocational and general education placements with few given opportunities in advanced placement or college prep courses (Miller, 2000).

**Summary**

There are clearly no easy answers for many children in rural schools. It is clear that a great many children are at risk for school failure, reading well below peers in suburban or affluent districts. Research has demonstrated there is increased risk for nonwhites, those who are English language learners and those in high poverty. However, federal initiatives set high standards and mandate accountability of educators across the nation with NCLB and IDEA. These mandates refuse to accept failure for any child. Two decades of research particularly since 2000 offer much data supporting the consensus that all children can learn to read.

RtI, or other models that focus on early identification of students at risk for school failure, offers hope for struggling students. A hope that children will learn to read before they become hopeless, unmotivated and at risk for other social-emotional difficulties. Success is contingent on committed educators who serve children. The success of pilot programs in selected rural and urban districts serves as proof that transformation can happen. All children are educable and all are capable of learning at higher levels than some schools currently expect. The key to becoming a good reader is increasing instructional time in reading. For children who are already at
risk or not making progress, this cannot be just any instruction, but intense explicit instruction that addresses the area of need. Recent research by Fletcher, et al., (2004), Shaywitz (2003) and Torgenson, (2004), reported that two hours of intense explicit instruction, over an eight-week period, in addition to classroom instruction, resulted in children increasing their reading skills into the average range.

The research is promising. Educators must work harder and smarter and not accept failure as the norm. As children find success, those that teach them also have improved morale and feelings of success, and in time, the entire community wins. There is an abundance of research that states explicitly that poor readers at third grade are poor readers at ninth grade and many are considered nonreaders or illiterate. Without changes, No Child Left Behind will meet the realization that many children will be left behind in ever-increasing numbers.
CHAPTER 3

METHODOLOGY

The purpose of this chapter is to detail the methods used to address the descriptive, correlational ex post facto study introduced in Chapter 1. A description of variables, the relationship among variables and the differences among variables will be examined. The purpose of associational research is to clarify “understanding of important phenomena through the identification of relationships among variables” (Frankel and Wallen, p. 339, 2003). The first purpose of this study is to describe the characteristics of the rural elementary students included in this study. The study will examine the relationship between the use of a screening tool in kindergarten and reading outcomes at second grade. It will also examine the relationships that exist among the selected student demographic characteristics. Finally, the study will examine the differences between independent variables and dependent variables. Independent variables in this study were whether students attended a preschool or not, gender, socioeconomic status (lunch subsidy), year of attendance in second grade (2003, 2005) and the school in which the child attended kindergarten (1-4). The dependent variables were scores on the DIBELS letter naming fluency (LNF) and initial sound fluency (ISF), oral reading fluency probe scores (WPM) and
comprehension diagnostic scores. The methodology covers the following: (a) research design (b) population sample (c) instruments (d) data analysis.

**Sample Population**

The sample for this study consists of children who began kindergarten during the 2002/03 school year and scores from children who were in second grade in 2002/03. Data were collected from all four elementary schools in a small rural district in west-central Ohio. Only the scores from those students who attended school within the district for the three-year period, remaining within the school district until the completion of the 2004/05 school year were included in the study. Complete data were available on 160 students who entered the district as kindergarteners in 2002/03. There were complete data on 122 children who were in second grade at the end of 2003. Children were randomly assigned to classrooms by district staff. Scores of children with multiple handicapping conditions, limited English proficiency and those who moved into the district after kindergarten were excluded from the study. Scores for children who had complete data from the beginning of kindergarten through grade two were included.

The school district is located at the county seat that has one school district with a total student population of 2795 students. The county has a population of 46,000 of which 13,069 live in the county seat (2000 census). The county is primarily agricultural with a per capita income below the state and federal averages. For the county seat, the median income is $36,029.00 with 20.7% of children under
the age of 18 below the poverty level (U.S Bureau of the Census, 2000). Within the
district, 32% of all students were on free or reduced lunch programs during the 2004-
2005 school year. Eligibility for a free or reduced lunch is determined by federal
guidelines and is based on a family’s yearly income. The ethnic composition of the
district is 90% white, 5.13% African American, 1.12% Hispanic and 2.4% reported
as multi-racial.

A current needs assessment for the county completed by the county’s
Partnership for Success (2006) was generated after participation in the United States
Office of Juvenile Justice and Delinquency Prevention initiative. The county’s
population has increased by 7.63% since 1990. It is projected it will increase at a
rate of 2.3% by 2030. Twenty-three percent of the population is aged 6-17. In 2000,
33.3% of households with children under 18 were married couple households. There
were 9.5% of the households headed by a single female parent. There were also 641
households with grandparents as caregivers. The percent of households with a four
year degree or greater was 11.4% in comparison to Ohio’s rate of 21.1%. While the
percent of persons engaged in farming is twice that for Ohio, the majority of
employed persons work in production, transportation and material movement (32.3%
compared to 19.0% for Ohio). The study found that 52.5% of families with children
younger than 5 years old were in poverty, 29.8% poverty families were headed by
females and 7.1% were married couple families. The county seat graduates an
average of 88.4% in comparison to similar school districts in Ohio (86.8). The
performance index rate is an average of 85.2% compared to 89.5% for similar
districts in Ohio as reported by Ohio Department of Education. An effective district index rate is 90.

The district operates 4 elementary schools (kindergarten through grade 5). Three of the four building were built in 1956 and are one-floor buildings. The largest elementary is in the northeast part of town and traditionally was the “elite” school of the district. At one time, only students from mid to high SES attended the school. It was perceived as being staffed by the best teachers and had an excellent reputation for quality teaching. It did not have the problems often associated with low SES. That has changed over the years and this school now has a low SES rate of over 35%. Although it now struggles with many of the same issues as the other elementary schools in the district, there is still a strong sense that it is still the “elite” school within the community and continues to have the highest levels of performance. Although this building is overcrowded, it is the only school with two satellite buildings, it is bright and colorful and has an inviting atmosphere. It also houses the majority of the special education population and has three multiple handicapped classrooms. It met Annual Yearly Progress (AYP) this past year with a performance index of 90.7%. The building has 23 teachers, 21 female and 2 male, 22 are white and one is African American. There is one building administrator and a nurse.

On the west side of town live the majority of the poor and many of the minority students. Neighborhoods are old, many houses have been converted to apartments that are owned by absentee property owners and there are several alleged
drug houses. There has been no new development in this area. The elementary school in this district has traditionally served the low SES populations. The public perception is that the children that attend this elementary come to school ill prepared, have parents who are not supportive and do not value education. Additionally, there is a mind-set that these children will not learn and poor achievement is the fault of the children not staff. This building is the same age as the previously mentioned school, smaller, but has an austere feeling. The current principal is making sweeping changes and he is confronting old perceptions about the students and the families of students that are in attendance. He initiated a book study using Ruby Payne’s *A Framework for Poverty* and then brought Ruby Payne to speak for an afternoon about the culture of poverty. This school has the highest rates of students on subsidized lunch programs and has the highest mobility rate of students. This school also has the smallest class sizes in the district. Additionally, it houses a multiple handicapped unit with several children with autism. It has the reputation of having the most children with behavioral problems. It met only two indicators on the report card, attendance and third grade reading with a performance index of 76.0%. It has a staff of 17 white female teachers and a male administrator.

On the southeast side of town there are two elementary schools. One is a similar building to the other two schools (one floor), it is situated in a working class neighborhood of small houses and few apartments. They have the lowest rates of children on free and reduced lunch. It has a stable population that now includes students from a high SES housing development. Although it has the highest
percentage of gifted children in the district, it also has the lowest passing rates on Ohio Department of Education’s (ODE) state mandated tests. Many parents opt to open enroll their children to the school on the northeast. The school met three of the indicators, attendance, 4\textsuperscript{th} grade writing and reading with a performance index of 87.5%.

The fourth elementary is almost a “one room school house”. It is the oldest school left in the district. There is only one classroom for each grade and is staffed by a head teacher. The student population is truly diversified with working class, students from a high-income area south of town and farming communities that are within the school district. Even so, they also have over 20\% of students on subsidized lunch programs. They have very few students identified with disabilities. This school met all nine performance indicators, is a high performing school with a performance index of 98.7\%. It is staffed by veteran teachers (average teaching years +20) who are 80\% female and are all white.

Children are assigned to schools by geographical boundaries and population distribution. The total school district population for students entering kindergarten in the fall of 2002 was 225. The total enrollment for children in second grade at the end of 2004/05 was 200 with 160 students from the original kindergarten group that began in 2002. Forty of the second grade students had not attended any of the four district elementary schools at the beginning of kindergarten in 2002. There were only 122 of the 250 second grade students’ from 2002/03 who had attended school within the district since entering kindergarten in the year 2000. For the purpose of
this study, data on the 160 second grade students for 2005 and 122 second grade students from 2003 from the four elementary schools were used.

**Setting:**

Prior to 2002, the district’s only screening was kindergarten screening which was held in the spring of the previous school year, 2001-2002. The screening consisted of a short form of the Brigance. Children were asked to identify shapes, colors, copy shapes, such as a circle and a cross, state their name, age and address and perform some gross motor skills, such as walking heel to toe. Articulation was also assessed by the speech/language pathologist. There was no systematic procedure for assessing early literacy, phonological awareness or sound fluency. Children who did not meet kindergarten benchmarks were often retained. Other children were passed to first grade. Title I services were available for some children with Title I teachers assisting within the classrooms. Children were referred to the intervention assistance teams by their classroom teachers, which was viewed as a direct route to special education. The results of the ODE’s 3rd grade Reading proficiency test for the spring of 2003 indicated a pass rate of 60% of 3rd grade students. The third grade Reading proficiency test results did not include any identified special education students. The previous six years of the Reading proficiency test results indicated an average passing rate for the district of 50.66%.
District Response

With the high stakes associated with NCLB and the Ohio Education Department’s report card the district took a proactive approach to reading and made acquiring reading skills a high priority in the district. In addition, the district had seen a steady increase in the numbers of children referred to the Intervention Assistance Teams for reading and subsequently identified for special education services and determined this trend was not healthy for the district as a whole and certainly not in the best interest of children.

The curriculum director implemented ongoing research based training that focuses on reading and how the child learns to read. Book studies were implemented and staff were provided with books such as, Yellow Brick Roads (Allen, J., 2000) and How the Brain Learns to Read (Sousa, D. A. 2005). Building administrators were encouraged to make changes relevant to their student population and to utilize staff that would have the most impact on creating an atmosphere of learning and targeting skill acquisition.

The district school psychologists and one of the speech language pathologists were trained in the administration and scoring of DIBELS by Roland Good in the spring of 2002 at an Ohio School Psychologist Association (OSPA) sponsored in-service in Cincinnati, Ohio. They, in turn, trained all kindergarten, first and second grade teachers on its use and purpose. All teachers were trained and instructed in a one-day training session with ongoing training offered by the Special Education Regional Resource Center (SERRC) and the initial team.
The team went through the training manual with all of the staff who would be giving the screener. The speech therapist drilled all on the proper pronunciation of nonsense words and other words that they would have to use in the administrations. Staff partnered and practiced giving and scoring the various subtests. It should be noted that there might not have been sufficient time allowed to practice scoring and timing. The teams did struggle with using a stop watch to time the tasks, while writing and speaking so they were given clipboards with built-in stop watches to make the task easier.

All kindergarteners, beginning with the 2002 school year were assessed with DIBELS, (Letter Naming Fluency, (LNF) and, Initial Sound Fluency (ISF)) and this information was used to drive instruction. The children were assessed three times a year and the intensity and or approach to their reading program was altered to promote growth in each child. After each assessment, children who were not making adequate progress, determined by graphing individual progress, the child’s program was intensified and/or changed (more and different) utilizing the cut scores recommended by the DIBELS manual. This approach is consistent with the Response to Intervention model promoted by the National Learning Center on Learning Disabilities and is a three-tiered problem solving approach.

All elementary schools in the district have Title 1 teachers and aides who provide additional instruction and practice for children whose scores on DIBELS indicate intensive support is needed and also target children whose scores are in the strategic support range. DIBELS provides instructional recommendations based on
scores that include benchmark (students whose scores fall in the average range for that screener), strategic support (students who are at risk in a strategic area, such as initial sounds) and intensive support (students who are considered at risk for reading difficulty and have low scores in all areas assessed). Title 1 teachers in 2002, were utilized differently by building; some worked directly in the classroom and assisted the teacher with reading instruction while others were strictly pull-out and saw children in small groups outside of the classroom for more intense support and instruction.

The school district does not have a uniform reading curriculum but does have a district basal series. The district otherwise has an eclectic approach to teaching reading with several programs available for individual choice by the classroom teacher. The district has also introduced the Four Block approach to reading. Please refer to the appendix.

**Instrumentation**

**Predictor Measures**

**Dynamic Indicators of Basic Early Literacy Skills (DIBELS)**

**DIBELS**: A screening/progress monitoring tool that is used to determine the level of student performance throughout the year. DIBELS was developed by Good and Kaminski (2002) and designed to target specific areas related to successful early literacy development. According to the authors, DIBELS can be used in schools particularly in kindergarten and first grade to answer questions such as: (a) Which
children are at risk for reading difficulty because of inadequate phonological awareness? (b) Which children need additional instruction in phonological awareness skills? (c) Is current instruction effective in increasing phonological awareness skills? (d) When has the child developed phonological awareness skills sufficient enough that it is no longer indicative of difficulty in learning to read? For beginning kindergarten students the skills targeted are initial sound fluency and letter naming fluency. All students were assessed in October of 2002. All measures are standardized and individually administered and rank students by established, emerging and deficit.

**LNF:** Children were shown a card containing upper and lower case letters printed along 11 rows with 10 letters per row. Children were asked to name as many letters as they could in 60 seconds, proceeding from left to right and down the card. The total score on the subtest is the number of letters named correctly per minute. Children below the 20th percentile in letter naming fluency are considered at risk for reading difficulty based on local norms. Forms for the LNF were developed by the research group of Good, et al. (1992). The benchmark for fall is 8-10 letters with a benchmark of 25 by winter.

**ISF:** The examiner says an initial sound and asks the child to match the sound with the picture that matches the sound. Students are presented with four pictures from which to choose. For example the examiner states, “This is mouse, flowers, pillow
and letters. Which one begins with the sound /m/?” The student is also asked to orally produce the initial sound of a word that matches one of the pictures. The examiner will say, “What sound does pillow begin with?” The examiner calculates the time taken to complete the task and the number of items the child answers correctly. The score is then converted to the number of correct initial sounds identified per minute. The benchmark at the beginning of kindergarten for ISF is 10 sounds with a benchmark of 25 initial sounds by winter.

**Oral reading fluency probes:** Students are asked to read a grade appropriate passage for one minute. The examiner tallies all missed words and calculates a probe score by the number of words read correctly per minute. This is repeated three times with different passages and an average of the three oral reading fluency probes is the recorded score. The benchmark for the end of second grade is 90 wpm.

**ODE’s Ohio’s Assessment System for Reading:** Students performing at benchmark (score of 31) can identify ending and medial sounds in words, can blend sounds into words and can segment many words into sounds. These students usually can identify the meanings of words that contain affixes as well as the antonyms and synonyms of grade-level words. They typically can demonstrate comprehension of text they have read by answering most questions about the ideas in the text or by orally retelling the main events in a story. They can read orally in phrases with a high degree of accuracy and with some expression. They often apply the rules of
syntax and punctuation as they read. Children have a diagnostic test booklet in which they read and select answers or write answers about what they have read (http://www.ode.state.oh.us/proficiency/Diagnostic_Achievement/default.asp).

**Data Collection Procedures**

The study was reviewed and approved by the Institutional Review Board (IRB) at The Ohio State University and was deemed exempt due to the archival nature of the study. All data existed prior to June of 2005 and was recorded in such a manner that subject scores and other data can not be linked to any individual. A letter of support and permission to obtain archival data was submitted from the superintendent of the district. A copy of the letter can be found in the appendix.

Archival data were collected from classroom records at each elementary school and from the district’s student record system which includes the State of Ohio reporting system, Education Management Information System (EMIS) and special education records by district staff. The data consisted of the previous administrations of DIBELS and the state diagnostic reading test for Ohio for children who entered kindergarten in 2002/03. Second grade student in the year 2002/03 were assessed with an oral reading fluency probe, a one-minute probe of words read correctly per minute (wpm). Each student’s information was recorded on a data collection form and coded numerically to protect identities. Information on the data sheets consisted of the following: coded number, elementary school name, status for free or reduced lunch, gender, prior preschool experience, kindergarten DIBELS
scores for letter naming fluency and initial sound fluency, 2nd grade diagnostic score, oral reading fluency score and if there was an identification of special education for a learning disability in reading. A data sheet is attached in the appendix.

**Data Analysis**

This correlational study examined the differences between reading scores before and after a systematic procedure was implemented and whether reading scores were different for the two groups of children at the second grade level (years 2003, 2005). Children who were in second grade in the spring of 2005 were assessed at the beginning of kindergarten with the initial sound fluency (ISF) and letter naming fluency (LNF) components from Dynamic Indicators of Basic Early Literacy Skills (DIBELS). The children in the group who attended second grade in the spring of 2003 did not receive the DIBELS assessment. The 2003 second grade students’ probe scores were compared to the second grade probe scores of children in the spring of 2005. In addition, this study examined whether a preschool experience made a difference on acquisition of reading skills indicated by the end of second grade year’s diagnostic scores.

All statistical analyses were conducted using SPSS 13.0 for Windows software. The relationship between the two dependent variables, the beginning kindergarten scores on the DIBELS (Initial Sound Fluency, Letter Naming Fluency) and second grade scores (DIBELS reading probe scores and state diagnostics), was analyzed using the general linear model, or a stepwise regression analysis. Analysis
of Variance or ANOVA was used to determine if there was a difference between the
two groups of children, those who were assessed with DIBELS and those who were
not assessed.

The use of a correlational ex post facto design and the use of multiple t-tests
along with descriptive statistics and mean scores were utilized to analyze the
differences/differential predictions between groups based on gender, preschool
experience and SES (socioeconomic status) on the DIBELS (ISF and LNF) and
reading fluency (probe scores) and comprehension at the end of second grade.

In summary, both descriptive and univariate statistics were utilized. This
chapter explains the methods utilized by one rural school district to increase reading
skills. The district utilized current research on how children learn to read,
implemented screening instruments to guide instruction, followed the Response to
Intervention (RtI) ideology, utilized evidenced based methods, provided ongoing
training to staff, empowered building administrators to be agents of change, and
provided training and information on reading to parents.
CHAPTER 4

RESULTS

Introduction

This chapter presents the findings of the data collected on students who were in second grade in the years 2002/2003 and 2004/2005 and attended the school district from kindergarten through the end of second grade. All children were assessed at the end of second grade with an Oral Reading Fluency probe and words correct per minute (wpm) were recorded. The benchmark set by the district for the probe or wpm is 90 by the end of second grade. Students who attended second grade in the spring of 2005 also were assessed with the ODE’s reading diagnostics for comprehension. The comprehension target score or benchmark set by the state (ODE) for the end of second grade is 31. In addition all second grade students from 2004/2005 were screened at the beginning of kindergarten (02/03) using DIBELS Initial Sound Fluency (ISF) and Letter Naming Fluency (LNF). The benchmarks for the October 2002 screening was LNF 8-10 letters and for ISF 8 initial sounds.

The analyses were conducted according to the questions and objectives of the study. Descriptive statistics for the entire sample are presented and then results are presented for each question.
Descriptive factors

There were 122 students in second grade at the end of 2003 and 160 students in second grade at the end of 2005 as indicated in Table 4.1. Of the total 282 students from both years 101 attended school 1, 46 attended school 2, 75 attended school 3 and 60 attended school 4.

<table>
<thead>
<tr>
<th>School</th>
<th>2003</th>
<th>2005</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>47</td>
<td>54</td>
<td>101</td>
</tr>
<tr>
<td>2</td>
<td>22</td>
<td>24</td>
<td>46</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
<td>45</td>
<td>75</td>
</tr>
<tr>
<td>4</td>
<td>23</td>
<td>37</td>
<td>60</td>
</tr>
<tr>
<td>Total</td>
<td>122</td>
<td>160</td>
<td>282</td>
</tr>
</tbody>
</table>

Table 4.1: Total students in each school for years 2003 and 2005.

Of the total population of students (n=282) who were assessed with oral reading fluency probes in the spring of 2003 and 2005, 34% received a lunch subsidy (N=97), 28.7% (N= 81) attended a preschool (MRDD Discovery Center or Head Start) and there were 155 males and 127 females. In the spring of 2003, 26% of the second grade students received a lunch subsidy, 34% attended preschool and there were 69 males and 43 females. For the group of students who were in second grade in the spring of 2005 41% (N=65) received a lunch subsidy, 25% (N=40) attended preschool with 86 males and 74 females in attendance at the end of second grade. Refer to tables 4.2.
<table>
<thead>
<tr>
<th>Value Label</th>
<th>2003</th>
<th>2005</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free-reduced lunch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No subsidy</td>
<td>90</td>
<td>95</td>
<td>185</td>
</tr>
<tr>
<td>Subsidy</td>
<td>32</td>
<td>65</td>
<td>97</td>
</tr>
<tr>
<td>Preschool Experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No preschool</td>
<td>81</td>
<td>120</td>
<td>201</td>
</tr>
<tr>
<td>preschool</td>
<td>41</td>
<td>40</td>
<td>81</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>69</td>
<td>86</td>
<td>155</td>
</tr>
<tr>
<td>female</td>
<td>43</td>
<td>74</td>
<td>127</td>
</tr>
<tr>
<td>Total</td>
<td>122</td>
<td>160</td>
<td>282</td>
</tr>
</tbody>
</table>

Table 4.2: Number of students broken down SES, preschool experience and sex by year.

**Differences in percentages:
Questions 1, 2 and 3**

*Question 1: Is there a difference in the percentage of students who met the district benchmarks for oral reading fluency (wpm) in 2003 and 2005 after a systematic procedure was implemented?*

Descriptive statistics are presented in Table 4.3 for the percentage of students who met the district benchmarks for oral reading fluency (wpm) in 2003 and 2005 after a systematic district-wide screening procedure was implemented. In the spring of 2003, 56 students out of the 122 students assessed (45.9%) met the benchmark of 90 wpm for oral reading fluency. In the spring of 2005, 86 students out of 160 assessed (53.8%) met the oral reading fluency benchmark. For both years, 142 out of total of 282 students (50.4%) met the benchmark. The Fisher’s Exact Test measures associations between two dichotomous variables. No difference was found
between the percentage of students who met the benchmark for oral reading fluency for years 2003 and 2005 (exact significance =.118).

<table>
<thead>
<tr>
<th>Year</th>
<th>not at benchmark</th>
<th>at benchmark</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>66.0</td>
<td>56.0</td>
<td>122.0</td>
</tr>
<tr>
<td></td>
<td>60.6</td>
<td>61.4</td>
<td>122.0</td>
</tr>
<tr>
<td></td>
<td>54.1%</td>
<td>45.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>2005</td>
<td>74.0</td>
<td>86.0</td>
<td>160.0</td>
</tr>
<tr>
<td></td>
<td>79.4</td>
<td>80.6</td>
<td>160.0</td>
</tr>
<tr>
<td></td>
<td>46.3%</td>
<td>53.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Total</td>
<td>140.0</td>
<td>142.0</td>
<td>282.0</td>
</tr>
<tr>
<td></td>
<td>140.0</td>
<td>142.0</td>
<td>282.0</td>
</tr>
<tr>
<td></td>
<td>49.6%</td>
<td>50.4%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 4.3: Year in second grade * percent of students at benchmark for oral reading fluency. Crosstabulations

Note: The top number in each cell is observed count, the middle number is the expected count and the bottom number is the percentage.

Question 2: Is there a difference in the percentage of students meeting the benchmark between 2003 and 2005 and does the difference vary between school of attendance in kindergarten?

The analysis for all students is based on school of attendance in kindergarten.

For the students who were in second grade at the end of 2003, School 1 had 61.7% of students meeting the oral reading fluency benchmark of 90. School 2 had 45.5% of students meeting the benchmark, School 3 had 26.7% at benchmark and School 4 had 39.1% meeting the benchmark. For the students who were in second grade at the
end of 2005, School 1 had 81.5% of students meeting the benchmark, School 2 had 37.5%, School 3 had 40% and School 4 had 40.5% of students meeting the benchmark. The Fisher’s Exact Test was run for each building and the alpha level was adjusted to reduce error. The tests indicated no significant difference in the percentage of students meeting the benchmark between the years 2003 and 2005 for three of the schools. A significant difference in School 1 was found in the percentage of students meeting the benchmark in 2005 following the implementation of a systematic screening procedure (exact significance= .023). This is less than the adjusted .025 significance level.
<table>
<thead>
<tr>
<th>School</th>
<th>Year</th>
<th>Not at Benchmark</th>
<th>At Benchmark</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2003</td>
<td>18.0</td>
<td>29.0</td>
<td>47.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13.0</td>
<td>34.0</td>
<td>47.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38.3%</td>
<td>61.7%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td>10.0</td>
<td>44.0</td>
<td>54.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15.0</td>
<td>39.0</td>
<td>54.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18.5%</td>
<td>81.5%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>28.0</td>
<td>73.0</td>
<td>101.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28.0</td>
<td>73.0</td>
<td>101.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>27.7%</td>
<td>72.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>2</td>
<td>2003</td>
<td>12.0</td>
<td>10.0</td>
<td>22.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12.9</td>
<td>9.1</td>
<td>22.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>54.5%</td>
<td>45.5%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td>15.0</td>
<td>9.0</td>
<td>24.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.1</td>
<td>9.9</td>
<td>24.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>62.5%</td>
<td>37.5%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>27.0</td>
<td>19.0</td>
<td>46.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>27.0</td>
<td>19.0</td>
<td>46.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>58.7%</td>
<td>41.3%</td>
<td>100.0%</td>
</tr>
<tr>
<td>3</td>
<td>2003</td>
<td>22.0</td>
<td>8.0</td>
<td>30.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19.6</td>
<td>10.4</td>
<td>30.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>73.3%</td>
<td>26.7%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td>27.0</td>
<td>18.0</td>
<td>45.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29.4</td>
<td>15.6</td>
<td>45.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60.0%</td>
<td>40.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>49.0</td>
<td>26.0</td>
<td>75.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>49.0</td>
<td>26.0</td>
<td>75.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>65.3%</td>
<td>34.7%</td>
<td>100.0%</td>
</tr>
<tr>
<td>4</td>
<td>2003</td>
<td>14.0</td>
<td>9.0</td>
<td>23.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13.8</td>
<td>9.2</td>
<td>23.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60.9%</td>
<td>39.1%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>2005</td>
<td>22.0</td>
<td>15.0</td>
<td>37.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22.2</td>
<td>14.8</td>
<td>37.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>59.5%</td>
<td>40.5%</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>36.0</td>
<td>24.0</td>
<td>60.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>36.0</td>
<td>24.0</td>
<td>60.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60.0%</td>
<td>40.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 4.4: Year in second grade* school* percent of students at the benchmark for oral reading fluency. Crosstabulations.

Note: The top number in each cell is observed count, the middle number is the expected count and the bottom number is the percentage.
Question 3: Is there a difference between the percentage of students who met the benchmark for comprehension and does the difference vary according to the school of attendance in kindergarten?

On the comprehension measure at the end of second grade in 2005, 77.8% of students at School 1 met the benchmark, 58.3% at School 2, 68.9% at School 3 and 71.3% of students at School 4 were at or above the benchmark. For all four schools 72.3% of students were at or above the benchmark of 31 on the state comprehension diagnostics test. Chi-Square statistics did not indicate any differences between the observed and expected count of students who met the benchmark among the four schools and for the overall sample. Refer to Table 4.5.

<table>
<thead>
<tr>
<th>School</th>
<th>Students meeting comprehension benchmark</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Did not meet benchmark</td>
<td>Met benchmark</td>
</tr>
<tr>
<td>1</td>
<td>12.0</td>
<td>42.0</td>
</tr>
<tr>
<td></td>
<td>15.5</td>
<td>38.5</td>
</tr>
<tr>
<td></td>
<td>25.9%</td>
<td>74.1%</td>
</tr>
<tr>
<td>2</td>
<td>10.0</td>
<td>14.0</td>
</tr>
<tr>
<td></td>
<td>6.9</td>
<td>17.1</td>
</tr>
<tr>
<td></td>
<td>54.2%</td>
<td>45.8%</td>
</tr>
<tr>
<td>3</td>
<td>14.0</td>
<td>31.0</td>
</tr>
<tr>
<td></td>
<td>12.9</td>
<td>32.1</td>
</tr>
<tr>
<td></td>
<td>35.6%</td>
<td>64.4%</td>
</tr>
<tr>
<td>4</td>
<td>10.0</td>
<td>27.0</td>
</tr>
<tr>
<td></td>
<td>10.6</td>
<td>26.4</td>
</tr>
<tr>
<td></td>
<td>37.8%</td>
<td>62.2%</td>
</tr>
<tr>
<td>Total</td>
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<td>114.0</td>
</tr>
<tr>
<td></td>
<td>46.0</td>
<td>114.0</td>
</tr>
<tr>
<td></td>
<td>35.6%</td>
<td>64.4%</td>
</tr>
</tbody>
</table>

Table 4.5: School * students meeting comprehension benchmark. Crosstabulation
Note: the top number in each cell is observed count, the middle number is the expected count and the bottom number is the percentage.
Differences in the mean between years and schools: Questions 4 and 5.

Question 4: Is there a difference in the mean oral reading fluency scores between 2003 and 2005 after a systematic district-wide procedure was implemented?

Question 5: Does the difference in the mean oral reading fluency scores vary by school of attendance in kindergarten?

A 2x4 analysis of variance design (ANOVA) was used to determine if there were differences between student’s oral reading fluency scores between years 2003 and 2005 after a systematic screening procedure was implemented in the district. The design was also used to determine differences of scores between the buildings of attendance in kindergarten. The descriptive statistics are in Table 4.6 for all four schools. The mean score for student’s oral reading fluency probes at the end of 2003 was 84.73. The mean score for the year 2005 was 88.96 with a district mean of 87.13 for students from both school years (2003, 2005).

For the year 2003, students at School 1 had a mean oral reading fluency score of 94.30 and for year 2005 a mean score of 108.5. School 2’s students had a mean score in 2003 of 89.27 and a mean score in 2005 of 79.38. School 3’s mean for students in 2003 was 71.27 and for 2005 were 77.02. School 4’s students had a mean score of 78.39 in 2003 and 81.16 in 2005. Students who attended kindergarten in School 1 had a mean score at or above the benchmark for both years. School 1 made a gain of 14.20 wpm from 2003 to 2005. School 2 had a decline in scores by
9.89 wpm. School 3 had an increase in scores by 5.75 wpm and school 4 increased scores by 2.77. Overall, the district improved scores from 84.73 to 88.96.

There were no interactions between the school of attendance at the beginning of kindergarten and whether or not students participated in a systematic screening procedure on oral reading fluency scores in 2002/2005 at the end of second grade. There was no main effect on oral reading fluency scores between years 2003 and 2005 after a systematic district-wide screening procedure had been implemented $F = .566$ (df,1) $p > .025$. However, there was a main effect for school of attendance in kindergarten. Students did perform better on oral reading fluency probes at the end of second grade based on which school they began kindergarten within the district $F = 10.448$ (df, 3) $p < .025$.

<table>
<thead>
<tr>
<th>School</th>
<th>2003</th>
<th>2005</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>94.30</td>
<td>108.05</td>
<td>101.89</td>
</tr>
<tr>
<td></td>
<td>37.26</td>
<td>32.38</td>
<td>35.28</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>54</td>
<td>101.00</td>
</tr>
<tr>
<td>2</td>
<td>89.27</td>
<td>79.38</td>
<td>84.11</td>
</tr>
<tr>
<td></td>
<td>22.36</td>
<td>35.54</td>
<td>30.06</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>24</td>
<td>46.00</td>
</tr>
<tr>
<td>3</td>
<td>71.27</td>
<td>77.02</td>
<td>74.72</td>
</tr>
<tr>
<td></td>
<td>40.16</td>
<td>33.23</td>
<td>36.01</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>45</td>
<td>75.00</td>
</tr>
<tr>
<td>4</td>
<td>78.39</td>
<td>81.16</td>
<td>80.10</td>
</tr>
<tr>
<td></td>
<td>36.04</td>
<td>29.83</td>
<td>32.08</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>37</td>
<td>60.00</td>
</tr>
<tr>
<td>Total</td>
<td>84.73</td>
<td>88.96</td>
<td>87.13</td>
</tr>
<tr>
<td></td>
<td>36.46</td>
<td>35.17</td>
<td>35.73</td>
</tr>
<tr>
<td></td>
<td>122</td>
<td>160</td>
<td>282.00</td>
</tr>
</tbody>
</table>

Table 4.6: Oral reading fluency score means, standard deviations and cell size by school of attendance in kindergarten.
Note: The top number in each cell is the mean, the middle number in each cell is the standard deviation, and the bottom number is the cell size.
<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>650.769</td>
<td>1</td>
<td>650.769</td>
<td>.566</td>
<td>.452</td>
<td>.002</td>
</tr>
<tr>
<td>School</td>
<td>36027.256</td>
<td>3</td>
<td>12009.085</td>
<td>10.448</td>
<td>.000</td>
<td>.103</td>
</tr>
<tr>
<td>Year*School</td>
<td>4730.229</td>
<td>3</td>
<td>1576.743</td>
<td>1.372</td>
<td>.252</td>
<td>.015</td>
</tr>
<tr>
<td>Error</td>
<td>314932.668</td>
<td>274</td>
<td>1149.389</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2499500.000</td>
<td>282</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.7: Test of between subjects effects and interactions between year and school. Dependent Variable: Words correct per minute

Scheffe post hoc tests were made for comparisons of performance on dependent measures between schools. Scheffe tests are considered very conservative and err on the side of underestimating differences. There were no differences between schools for initial sound fluency. There was a significant difference in performance on letter naming fluency between School 1 and Schools 2 and 3. There was no significant difference between Schools 1 and 4. There were also significant differences on oral reading fluency (words read correct per minute) between School 1 and all three other schools. On comprehension measures, there was a difference between Schools 1 and 3. Students from School 3 had higher comprehension scores than students attending School 1.
Predictability of DIBELS:

Question 6: Does Letter Naming Fluency (LNF) and Initial Sound Fluency (ISF) at the beginning of kindergarten predict second grade oral reading fluency and comprehension?

At the beginning of kindergarten the two screeners were DIBELS letter naming fluency (LNF) and initial sound fluency (ISF). Descriptive statistics are presented in Table 4.8. The mean score for initial sound fluency was 10.80, the mean score for letter naming fluency was 14.01, wpm was 87.13 and comprehension was 36.86. For children who began kindergarten in 2002/03, the group mean score for the October DIBELS screening for ISF and LNF was at or above the benchmark. Words correct per minute or the group mean oral reading fluency probe score was below the benchmark of 90 wpm at the end of second grade (2005). The comprehension group mean is above the benchmark of 31 (ODE recommended on target score) at the end of second grade in 2005.

Regression analysis is a method of explaining or predicting the variability of a criterion variable and attempts to answer the question “to what extent can you predict a variable based on what you know of other variables?” (Vogt, p. 240, 1998). Results of a stepwise regression analysis indicate that letter naming fluency (LNF) is predictive of scores on oral reading fluency (words read correct per minute) or for every unit increase in LNF we could expect a unit of increase in oral reading fluency probe scores. Letter naming fluency (LNF) is significantly correlated with oral reading fluency (wpm) $R = .575$. The adjusted R square .326 indicates that 33% of
the variability on oral reading fluency probes (words read correct per minute) is
predicted on the basis of letter naming fluency (LNF). Results in Table 4.8, indicate
that LNF, (F (1,158) = 77.982, p< .025) did predict later success as measured by oral
reading fluency (words correct per minute). However, letter naming fluency as
measured at the beginning of kindergarten (Oct) did not contribute to future
comprehension skills (R square =.03) as measured at the end of second grade in
2005, (F (1.158)= 4.86, p = >.025). Table 4.10 presents the correlation results and
letter naming fluency contributed significantly (p=.000) to oral reading fluency
(words read correct per minute) scores with a beta of .575. Initial sound fluency
(ISF) was an excluded variable from the model and did not predict or contribute to
later success on oral reading fluency probes scores or on comprehension skills (p>
.025). Once you partial ou or control for LNF, ISF did not contribute any additional
information to the model in determining future success in reading. The correlation
between LNF and ISF was .494 and was statistically significant.
### Table 4.8: Mean, standard deviations and cell number for dependent variables.

Note: The top number is the group mean, the middle number is the standard deviation and the bottom number is the cell number.

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Sound Fluency</td>
<td>10.80</td>
<td>7.46</td>
<td>160</td>
</tr>
<tr>
<td>Letter Naming Fluency</td>
<td>14.01</td>
<td>15.06</td>
<td>160</td>
</tr>
<tr>
<td>Words Correct Per Minute</td>
<td>88.96</td>
<td>35.17</td>
<td>160</td>
</tr>
<tr>
<td>Comprehension</td>
<td>36.86</td>
<td>12.06</td>
<td>160</td>
</tr>
</tbody>
</table>

### Table 4.9: ANOVA results of predictability on oral reading fluency (wpm) scores for LNF.

Note: a Predictors: (Constant), letter naming fluency
b Dependent Variable: words correct per minute

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>65006.73</td>
<td>1</td>
<td>65006.73</td>
<td>77.98</td>
<td>.000(a)</td>
</tr>
<tr>
<td>Residual</td>
<td>131709.96</td>
<td>158</td>
<td>833.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>196716.69</td>
<td>159</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum of Squares</td>
<td>df</td>
<td>Mean Square</td>
<td>F</td>
<td>Sig.</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>----</td>
<td>-------------</td>
<td>------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>Regression</td>
<td>690.148</td>
<td>1</td>
<td>690.148</td>
<td>4.859</td>
<td>.029(a)</td>
</tr>
<tr>
<td>Residual</td>
<td>22443.546</td>
<td>158</td>
<td>142.048</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>23133.694</td>
<td>159</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.10: ANOVA results of predictability of LNF on comprehension scores.

a Predictors: (Constant), letter naming fluency

b Dependent Variable: comprehension

<table>
<thead>
<tr>
<th>Initial Sound Fluency</th>
<th>Letter Naming Fluency</th>
<th>Words Correct per Minute</th>
<th>Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter Naming Fluency</td>
<td>.494</td>
<td>.260</td>
<td>.127</td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.001</td>
<td>.110</td>
</tr>
<tr>
<td>Words Correct per Minute</td>
<td>.575</td>
<td>.000</td>
<td>.029</td>
</tr>
<tr>
<td>Comprehension</td>
<td>.322</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 4.11: Correlations between ISF, LNF, WPM and Comprehension.
Are there differences for children with a prior preschool experience, SES and gender on LNF, ISF, oral reading fluency or comprehension?

**Questions 7, 8, 9**

Individual t-tests were used to analyze the differences between the independent variables: gender, SES and preschool experience on the dependent variables: Letter Naming Fluency (LNF), Initial Sound Fluency (ISF), (kindergarten, October, 2002), probe scores at the end of second grade (2003, 2005) and comprehension scores at the end of second grade (2005). All dependent variables were analyzed separately with a t-test and with a reduced alpha level of .025 to reduce Type I error. All probe scores for second grade students from 2003 and 2005 were included.

*Question 7: What is the difference between students who received a preschool experience and those who did not on initial LNF and ISF scores and second grade diagnostic reading scores (oral reading fluency and comprehension)?*

There were no differences between children who attended preschool versus those who did not on LNF, ISF or oral reading fluency probes (words read correct per minute), see Table 4.12. However, a significant difference between the two groups was found for comprehension skills as assessed on the state diagnostic test, preschool experience was correlated (p<.025). Because The Levene’s Test indicated that the assumption of homogeneity of variance was violated and the cell sizes are unequal, the corrected df are being used.
<table>
<thead>
<tr>
<th></th>
<th>Preschool</th>
<th>No Preschool</th>
<th>T</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Sound Fluency</td>
<td>12.40</td>
<td>10.27</td>
<td>-1.343</td>
<td>53.314</td>
<td>.185</td>
</tr>
<tr>
<td></td>
<td>9.27</td>
<td>6.72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40.00</td>
<td>120.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter Naming Fluency</td>
<td>16.15</td>
<td>13.29</td>
<td>-1.040</td>
<td>158.00</td>
<td>.300</td>
</tr>
<tr>
<td></td>
<td>16.13</td>
<td>14.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40.00</td>
<td>120.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Words Correct Per Minute</td>
<td>81.26</td>
<td>89.49</td>
<td>1.635</td>
<td>128.239</td>
<td>.104</td>
</tr>
<tr>
<td></td>
<td>39.95</td>
<td>33.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>81.00</td>
<td>201.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehension</td>
<td>32.85</td>
<td>38.13</td>
<td>2.799</td>
<td>85.906</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>9.67</td>
<td>12.51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40.00</td>
<td>120.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.12: Group statistics for students who did or did not attend preschool.
Note: For columns denoting preschool and no preschool, the top number is the mean, the middle number is the standard deviation and the bottom number is the cell number.

**Question 8:** What is the difference between students who were on a lunch subsidy and those who were not on a lunch subsidy on initial LNF, ISF scores and second grade diagnostics (oral reading fluency and comprehension)?

T-test results for students who were not subsidized or who received free-reduced lunch (SES) were run and results in table 4.12 indicate that there was no significance between the groups who did or did not receive a lunch subsidy for LNF, ISF and comprehension. For the variable oral reading fluency (wpm) children who did not receive a lunch subsidy, F (280) = .931, p < .025 was different at the end of second grade for both groups of students (2003, 2005). The Levene’s Test did not indicate any violations of the assumption of homogeneity of variance.
<table>
<thead>
<tr>
<th></th>
<th>Subsidized lunch</th>
<th>No lunch subsidy</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Sound</td>
<td>9.52</td>
<td>11.67</td>
<td>1.803</td>
<td>158</td>
<td>.073</td>
</tr>
<tr>
<td>Fluency</td>
<td>7.27</td>
<td>7.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>65.00</td>
<td>95.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter Naming</td>
<td>10.88</td>
<td>16.15</td>
<td>2.200</td>
<td>158</td>
<td>.029</td>
</tr>
<tr>
<td>Fluency</td>
<td>14.67</td>
<td>15.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>65.00</td>
<td>95.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Words Correct Per Minute</td>
<td>78.01</td>
<td>91.91</td>
<td>3.152</td>
<td>280</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>36.59</td>
<td>34.42</td>
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<tr>
<td></td>
<td>97.00</td>
<td>185.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehension</td>
<td>35.31</td>
<td>37.92</td>
<td>1.347</td>
<td>158</td>
<td>.180</td>
</tr>
<tr>
<td></td>
<td>13.27</td>
<td>11.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>65.00</td>
<td>95.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.13: Group statistics for students who did or did not receive a lunch subsidy.

Note: Columns denoting subsidized lunch and no subsidized lunch, the top number is the mean, the middle number is the standard deviation and the bottom number is the cell number.

**Question 9:** What is the difference between males and females on initial LNF, ISF scores and second grade diagnostic reading scores (oral reading fluency probes and comprehension)?

No differences were found between males and females on any of the dependent variables including: LNF, ISF, oral reading fluency probes scores (words correct per minute) or comprehension. There were no violations of the assumptions of homogeneity of variance indicated by the Levene’s Test.
Table 4.14: Group statistics for males and females for dependent variables.
Note: For columns denoting male and female, the top number is the mean, the middle number is the standard deviation and the bottom number is the cell number.

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Sound Fluency</td>
<td>10.60</td>
<td>11.03</td>
<td>-356</td>
<td>158</td>
<td>.722</td>
</tr>
<tr>
<td></td>
<td>7.68</td>
<td>7.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>86.00</td>
<td>74.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter Naming Fluency</td>
<td>12.48</td>
<td>15.78</td>
<td>-1.389</td>
<td>158</td>
<td>.167</td>
</tr>
<tr>
<td></td>
<td>14.77</td>
<td>15.29</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>86.00</td>
<td>74.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Words Correct per Minute</td>
<td>85.27</td>
<td>89.39</td>
<td>-.964</td>
<td>280</td>
<td>.336</td>
</tr>
<tr>
<td></td>
<td>34.37</td>
<td>37.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>155.00</td>
<td>127.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehension</td>
<td>36.91</td>
<td>36.80</td>
<td>.057</td>
<td>158</td>
<td>.954</td>
</tr>
<tr>
<td></td>
<td>11.06</td>
<td>13.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>86.00</td>
<td>74.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In summary, students who were not on free or reduced lunch performed better on measures of fluency at the end of second grade. Students who attended a preschool program at the MRDD Discovery Center or Head Start performed better on the comprehension diagnostics prescribed by ODE at the end of second grade. Table 4.14 did not indicate any differences on any of the dependent variables for gender. Males and females performed equally well on all tasks measured.
Special education identification:

*Question 10: Is there a difference in the proportion of students referred to special education before and after a systematic screening procedure was implemented?*

For the group of students who attended second grade in the year 2002/03, 9% of students were referred for special education assessment and subsequently qualified for special education under the identification of specific learning disability in the area of reading. The group of students who were in second grade at the end of 2005, 12 of the 160 students or 7.5% were referred and qualified for special education services for a reading disability.
CHAPTER 5
DISCUSSION

Concerned with years of declining reading scores on high stakes tests, the district in this study put a plan in place, based on current research, to increase reading skills for students while decreasing referrals and identification of students for special education services. They implemented a systematic district-wide screening procedure, DIBELS, added additional Title I support, utilized a three tiered model approach and utilized evidenced based reading programs. The sample for this study was elementary students who attended a rural school district for a three-year period from the beginning of kindergarten to the end of second grade. One group of students began school in the 00/01 school year and was second grade students in the 02/03 school year. The other group of students began kindergarten in the 02/03 school year and was second grade students at the end of the 04/05 school year.

In the fall of 2002, the school district implemented DIBELS across the district in the hopes that implementing the screener would result in identifying those children most at risk for reading difficulties. This was based on current research and information calling for stronger legislation and regulations to close the gaps between literacy and reading failure as well as other skill levels in other academic areas. The No Child Left Behind Act specifically requires states to close the achievement gaps
among all groups within the next 12 years or at least make substantial progress.
Other recommendations for school districts to address this issue were by adequately
screening children as they begin kindergarten and adopting a model such as, the
stressed that with early identification and appropriate intervention, the number of at
risk readers currently estimated as the bottom 20% could be reduced and referrals to
special education could drop to less than 2% of the population.

Based on information that supported the use of DIBELS, the district
expectation was that using the screener would lead to better, more appropriate
interventions for those students who scored at/or below the 20th percentile. This
would then result in improved oral reading fluency scores and fewer children
referred to the Intervention Assistance Team (IAT) and/or special education services.
However, the results of this study indicate students did not perform better on oral
reading fluency probes at the end of second grade in 2005 compared to students at
the end of second grade in 2003 before the district implemented DIBELS in
kindergarten. Scores for oral reading fluency probes for students in second grade
during the 2002/03 school year and scores for second grade students from the
2004/05 school year were compared to see if there was a significant difference.

While scores for some schools in the district did increase compared to the
2002/03 group of students, district-wide 45.9% were at benchmark in 2003 and
53.8% were at benchmark at the end of second grade in 2005, there was not a
significant difference between scores on oral reading fluency probes between the
groups. While this study can not clearly point to why there were not significant differences, there are several areas that past research suggests may have contributed to the lack of change. For example, there is a need for continuity throughout the district in the approach to reading, how the Title I program is utilized, inter-rater reliability checks and the implementation of an evaluation process. Results support the development of a uniform procedure for determining the level of intervention and when and how to change that intervention to maximize the potential of students. The early literacy team should also consider Good’s suggestion that the integrity of DIBELS may have been compromised and there may be errors among school teams in administration and scoring of the DIBELS measures. Inter-rater checks during future administrations would be beneficial in ensuring that errors did not occur. However, another significant issue is the lack of psychometrics available on the DIBELS assessment.

**Validity of Initial Sound Fluency and Letter Naming Fluency**

The current study which included historical data over a three-year period for 160 students who were screened at the beginning of kindergarten resulted in mixed support for the hypotheses that guided this study. The suggested criteria were utilized to give additional instruction/intervention to students who fell below the 20th percentile. The study results indicated that in the beginning of kindergarten, letter naming fluency was a significant predictor of future reading outcomes. However, in this study, at the beginning of kindergarten, initial sound fluency had no
predictability of later reading skills. Scarborough (1998) indicated that measures of phonological awareness might lack the sensitivity for identifying children at risk for reading failure because they produce both false negative and false positive identifications. A false negative would result in no additional instruction or intervention given to a child who was at risk and a false positive would result in added cost to the district by identifying student for intervention who did not necessarily need it. The Hintze (2002) study had similar results. While LNF and ISF did measure similar constructs to the CTOPP, they also resulted in many false negatives and false positives. Thus, indicating students were in need of intervention using DIBELS but problems were not indicated on the CTOPP or vice versa. Although ISF gives information that is helpful for instruction, LNF is indicated as the best predictor of future success in oral reading fluency when used as a screener at the beginning of kindergarten. None of the published studies examined the use of DIBELS as indicated in the model presented by Good (2002). They used modified forms of DIBELS, none looked at the beginning of kindergarten measures and only one was implemented with students in a rural school environment. The results of the current study clearly point to the need for further research in schools using the recommended versions of the screening tools.

Predictability of Prior Preschool Experience, SES and Gender

This study also examined whether prior preschool experience, SES and gender had any predictive relationship or correlation to how well students performed on the initial
DIBELS (LNF, ISF) scores, oral reading fluency probe scores at the end of second grade and second grade diagnostic comprehension scores. Research indicates that children who attended preschool should perform better on measures than students who did not benefit from a preschool experience. This was not supported by this study. The only measure that correlated highly with preschool experience was comprehension at the end of second grade. It could be that children with prior preschool experience benefit from an enriching language and vocabulary filled environment that assists them in comprehension of reading materials even if they are struggling with fluency. Students with preschool experience also had higher comprehension scores at some elementary schools.

As stated before, current research does indicate that pre-reading and reading skills must be introduced earlier than previously indicated and children need more time on task to overcome the gaps in reading. Emphasis on preschool programs and early elementary is believed to be the key to preventing reading failure. A similar instrument to DIBELS, Phonological Awareness Literacy Screening (PALS), is a screener to use with preschool students (http://www.curry.edschool.virginia.edu/go/pals) and is a requirement for the Reading First Grants for preschools. Reading development follows a series of predictable stages so screening tools must be sensitive to these stages and skill levels. The result of this study reinforces the recommendations by the National Association of Elementary School Principals that advocates bringing preschools experiences into line with kindergarten expectations (www.naesp.org, 2005). However, it was not until after 2002/03 school year that the district began a dialogue with preschools to encourage implementing pre-reading skills and bringing preschool expectations into line with kindergarten expectations so any
changes made by the preschools would have had no benefit on the students in the current study. It does support the need for school to collaborate with local preschools to encourage and support phonemic awareness activities before children enter kindergarten.

When reviewing outcomes indicated by this study, it is not plausible that the differences or lack of differences between the groups of students from 2003 and 2005 can be attributed to demographic differences alone. The district has a high rate of children on free and reduced lunch that are distributed throughout the district with the highest concentrations of children from the low SES group at Schools 1 and 4. Overall, the district had 34% on free and reduced lunch, with 26% for the group of second grade students from 2003 and 41% for the 2005 group. While the district had a higher percentage of students on lunch subsidies in 2005, scores actually increased. It would have been expected that for those schools with the highest concentrations of children on lunch subsidies scores would have declined. This was not the case and could be contributed to interventions and good teacher support. The group mean for children on lunch subsidy was lower for oral reading fluency probes at the end of second grade. This supports the stated hypothesis that students on free and reduced lunch programs would have lower reading skills at the end of second grade. However, children on lunch subsidies did not have lower comprehension scores than children not on lunch subsidies. It would be expected that higher rates of fluency correlate with higher rates of comprehension but the results from this study do not support that.

Gender did not appear to correlate with any of the dependent variables. Students did not have higher scores on initial kindergarten measures, end of second grade oral reading fluency probe scores or comprehension scores based on gender alone. Gender was not
significant on any of the dependent measures. Past research indicates that young females have stronger language skills than males but it is possible this difference does not exist for emerging skills. Further gender research is indicated to sort out why this study did not find any differences.

**Differences Among School of Attendance**

The building of attendance at the beginning of kindergarten in the district was predictive of end of second grade scores on oral reading fluency and on comprehension. While overall students across the district had scores for oral reading fluency below the benchmark of 90, students did perform significantly better based on which school they attended for kindergarten. So, even though many students moved during the three year period between buildings, those that attended certain buildings for kindergarten did better than students who may have stayed in the same building for three years. Unfortunately, students from one school in particular had lower scores after the implementation of DIBELS. Overall, the district improved scores from a mean score of 84.73 at the end of 2003 to 88.96 for district second grade students at the end of 2005. Students also performed better on the comprehension assessment at the end of second grade based on which building they attended for kindergarten.

Students from School 1 had the highest oral reading fluency scores with a mean score at or above the benchmark of 90 wpm while the other three schools had mean scores below the benchmark. On the reading comprehension diagnostic assessment, School 3 had the highest scores. All district elementary schools had a mean score above the benchmark set
by the Ohio Department of Education. One concern is how teachers interpreted the direction for scoring the assessment and the manner in which the scores were reported because some scores had to be recalculated for the study. It seems inconsistent that the mean score for oral reading fluency district wide was below the benchmark but the mean for comprehension tasks was above the set benchmark. Possible explanations could be time on task, some schools and teachers could spend more time on comprehension skills and less on oral reading fluency or district wide attention focused on high stakes testing and their implications. Students may have learned to “take the test”. Scores could also be affected by individual learning styles of students and/or teacher expectations for students.

**Limitations of This Study**

This study is limited to a small rural school district in West Central Ohio. Generalizations may be limited to districts with similar demographic populations. This study is also limited to students in grades kindergarten through second grade. Beginning of kindergarten DIBELS measures in 2002/03 were administered by teams that were newly trained. Each school building had their own teams and those teams change from year to year with new members given minimal training. While DIBELS gives a lot of information in a brief amount of time there is concern that a child may do poorly on the initial screening due to being timid or fearful and may not comply or answer quick enough to get an accurate score. However, by October, most kindergarten students would be familiar with the building staff. Oral reading fluency probes were presented and scored by the classroom teachers and by Title I
teachers. It has been suggested that children may also perform better if given longer time or even on a different day so other measures may be needed for accurate identification of students for placement in reading groups, Title I services or other intervention. Screening scores should also be compared to the child’s overall performance within the classroom.

This study is limited by a lack of a common curriculum across the district for kindergarten and first grade. While the district offers a variety of programs and teaching aides, each teacher can pick and choose the methods they wish to use for instruction. Please refer to the list of offered programs in the appendix. There was no control for differences in instructional material used throughout the three year period.

This study was limited by differences in how Title I teachers were utilized in the buildings. Students may not have gotten the same level of intervention from teacher to teacher and building to building. In 2002/03, some Title I staff was utilized in the classroom as aides to teachers and in other buildings they were strictly pullout programs. Staff did not have a systematic program and used materials preferred by Title I teams in that particular buildings.

In addition, this study did not factor out and examine the group of students who scored at or below the 20th percentile on the DIBELS measures. This may be useful information for the district and could indicate greater gains than indicated by the study. The groups scores may have been diluted by inclusion with all of the students scores for the study.
**Future Research**

Further research is essential to explore the validity of the DIBELS screening instruments in a school setting similar to the current study. Replications of this study would clarify whether at the beginning of kindergarten the two screening tools, Letter Naming Fluency and Initial Sound Fluency do in fact have validity and accurately predict future reading skills. To insure identification of the students most at risk, Hintze (2003) suggested different cut scores may be needed when using the screener to identify children early in kindergarten for additional intervention.

There is also a lack of research conducted in rural areas. Solid research would be a benefit because it would address the issues that are pertinent to smaller school districts that represent most rural areas. It may also be useful information for state and federal agencies, demonstrating the differences between small rural schools and larger urban and suburban school districts. Research would highlight the struggle to meet accountability demands because of shrinking budgets and the challenges of providing intervention with current staff and time limitations. NCLB may in fact be unattainable for rural schools, so additional research on rural schools would point out the difficulty with judging all schools with the same criteria.
Implications

Although there has been over 60 years of research on possible kindergarten predictors, what variables are predictive has changed and fluctuated with a variety of theories. The variables changed depending on the theory of reading that led to the development of the screening battery and the measures of evaluation (Schatschneider, et al, 2004). Even so, there is accumulating evidence that reading difficulties can be prevented, which has resulted in legislation and the Reading First Program. Reading First is a focused nationwide effort to enable all students to become early successful readers. Funds are dedicated to help states and local school districts eliminate the reading deficits by establishing high quality, comprehensive reading instruction in kindergarten through grades 3. Building on a solid foundation of research, the program is designed to select, implement and provide professional development for teachers using scientifically based reading programs, and to ensure accountability through ongoing, valid and reliable screening, diagnostic and classroom-based assessment (http://www.ed.gov/programs/readingfirst/index.html).

Results of this study have many implications for school districts. All school districts must be concerned with NCLB and high stakes testing. Teachers and administrators alike want to know how to best change reading outcomes. The literacy bar has been raised throughout the United States and improving reading achievement is mandated. The Reading First program and grants establishes clear and specific expectations for what can and should happen for all students. It specifies that classroom instructional decisions must be informed by scientifically
based reading research. Grants that are available for state and local programs insist students be systematically and explicitly taught five early reading skills:

1. Phonemic awareness - the ability to hear, identify, and play with individual sounds - or phonemes - in spoken words.

2. Phonics - the relationship between the letters of written language and the sounds of spoken language.

3. Fluency - the capacity to read text accurately and quickly.

4. Vocabulary - the words students must know to communicate effectively.

5. Comprehension - the ability to understand and gain meaning from what has been read.

Current research consistently indicates the need for screening beginning kindergarten students to identify those at risk and provide systematic and intense instruction early to prevent reading difficulties. However, there have been few studies that validate the use of these two measures and confirm their predictability of later reading skills. As the results of this study conclude, it appears that letter naming fluency was a valid predictor but initial sound fluency did not predict future success at reading. Good (2002) in his review of outcomes suggests that poor outcomes may be the result of inadequate instruction and lack of emphasis on
phonemic awareness, however, it may also be that more studies are needed to validate the use of these particular measures (LNF, ISF) as screening measures at the beginning of kindergarten. Both measures do give valid information and do indicate to teaching staff, which students are in need of more instruction than the rest of the class.

This study also indicates that many times, there is a strong emphasis on the disadvantages for children of poverty and this may obscure the fact that quality teaching and intervention may in fact play a greater role in students’ success. Poverty is a fact of life and needs to be addressed by society and schools, but it is not an excuse for poor teaching and inadequate instructional time. One group of students in this study with the highest oral reading fluency and comprehension scores were looped and had the same teacher for kindergarten and first grade and she is known for developing excellent reading skills in all of her students. So it seems excellent teaching can counter the results of poverty and lack of preschool experience. Results could also indicate that looping may be beneficial for student outcomes. Preschool experience has long been promoted for success when students begin kindergarten. If this is true, then the recommendations put forth by the National Association of Elementary School Principals (www.naesp.org) become essential. Preschool experiences must be brought into line with kindergarten expectations. The school district in this study has initiated meetings with all preschools to address literacy issues and the expectations of kindergarten. This initiative was started after the students in this study had the opportunity to attend
preschool. Future study of the results of this initiative is necessary to see if preschool experience has greater benefit than this study indicated on LNF, ISF and oral reading fluency. As stated before only the MRDD Discovery Center and Head Start data was available for this study. Future studies should interview or survey parents to determine which students may have attended private preschools as well.

Another challenge for school districts, including this one, is coordinating times to implement a truly intense explicit instruction for children struggling with reading. Districts do not have extra staff to implement the programs. The recommendations from the research over the past five years indicate children need +2 hours of instruction. It is a challenge to find qualified staff to implement the program daily. Perhaps staff must rethink how they currently implement support beyond the classroom. Instead of a “band-aid for a gushing wound” (Shaywitz, 2003) and intervention consisting of 15-20 minutes once or twice a week, children should be ranked by level of need and groups of 2 to 3 formed based on the LNF scores and classroom performance. Then instruction should occur for two hours a day for an eight-week period and then groups reformed.

That has happened to some extent for the current school year. The district has purchased licenses for Fast Forward, a computerized reading program. Students were ranked and given one hour of instruction time every day for 8-12 weeks. The challenge has been “when”. The district has found staff willing to come in early before school starts or to stay after school. They have creatively looked for time during the day that students could participate, such as during specials (art. gym or
music). With shrinking budgets but increasing mandates, schools may not have the luxury of hiring extra staff to put into practice these programs. Creativity is an important key to implement the level of instruction research recommends.

The implications for the school district of this study are many. The district is headed in the right direction by utilizing all of the current research. It has implemented DIBELS, the three-tier model to provide intervention and providing ongoing staff development. However, the fact that there is no common curriculum for kindergarten and first grade across the district must be addressed. If 80% of all students were at or above the benchmark for oral reading fluency, allowing teachers to pick and choose programs and teaching strategies would not be an issue. Good (2002) also suggested that poor outcomes may be the result of inadequate curriculum and instruction and a lack of emphasis on phonemic awareness and the integrity of DIBELS may have been compromised. As this study indicates, this is not working and administration and the early literacy team must address a uniform method of instruction with adequate training for teachers, a method of assessing the reliability of instruction and the development of an evaluation process. While scores have increased there is no significant difference between scores for students before and after a systematic district-wide screening procedure was implemented and the three-tiered model was implemented. It is also suggested that the district address how Title I teachers and classroom aides are utilized throughout the day to maximize delivery of additional intervention. Again, this should be district wide and not dictated by each school. Students who move between buildings should be able to
transition with minimal gaps in instruction or the level of support. Many of these suggestions have already been addressed within this district and analysis of data from subsequent groups of children since 2002/2003 school year may indicate significantly different results. Only time and “test scores” will tell.
BIBLIOGRAPHY


APPENDIX A

PROGRAMS AVAILABLE TO TEACHERS

Building Blocks: The Four-Blocks® Literacy Model for kindergarten classrooms utilizes Building Blocks. With Building Blocks, students experience a variety of reading and writing activities which instill the desire to learn to read and write, develop phonemic awareness, foster important language concepts, encourage letter and sound recognition, teach essential print ideas, and extend vocabulary. These six critical understandings are stressed in the Building Blocks balanced literacy program. (www.fourblocks.com)

Letter People: This research-based, classroom-tested, balanced literacy program promotes successful reading and writing. It is thematically organized and integrated across the curriculum. It promotes word building, reading and writing, balancing the best of phonemic awareness, the alphabetic principle, predictable and decodable text with literature based learning. It supports the Reading First Initiative. (www.abramsandcompany.com/lettterpeople_index.cfm)

Guided Reading Books: leveled books which provide opportunities to develop:
    Concepts about print
    Reading strategies
    Text comprehension strategies
    (e.g., identifying story structure, non-fiction structure).
(Pinnell & Fountas, www.readinglady.net)

Reading A-Z: offers thousands of printTable teacher materials to teach guided reading, phonemic awareness, reading comprehension, reading fluency, alphabet, and vocabulary. The teaching resources include professionally developed downloadable leveled books, lesson plans, worksheets, and reading assessments. (www.readinga-z.com)
**Earobics**: A research based computerized instructional curriculum that addresses phonological awareness, vocabulary, fluency, phonics and comprehension.  
(www.earobics.com)
APPENDIX B
DATA COLLECTION FORM

Data Collection Form

Data set number _____

Sex: M F

Prior preschool experience: Y N

Free/reduced lunch: Y N

School: W NE SE P

Fall Kindergarten (2002) DIBELS scores:
   Letter Naming Fluency: __________
   Initial Sound Fluency: __________

Fluency Probe Score: (end of year, 2003)
Second grade students: __________

State Diagnostic Test: Form A 2005
Second grade students: __________
APPENDIX C

LETTER OF SUPPORT FROM THE SCHOOL DISTRICT SUPERINTENDENT

See attached copy.
November 11, 2005

Office of Responsible Research Practices
300 Research Foundation Building
1960 Kenny Road
Columbus, OH 43210-1063

To Whom It May Concern:

I am writing this letter in support of Mrs. Rebecca DeVault, doctoral student at The Ohio State University. On behalf of our district, I would like to give my permission for Mrs. DeVault to obtain our district’s archival data for her dissertation. As a district, we are anxiously awaiting the results of this study in anticipation that these results will be beneficial to our district as we continue to improve our educational program for our students.

Sincerely,

Larry D. Anderson
Larry D. Anderson, Ph.D.
Superintendent