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# Factors influencing early literacy skill acquisition among at-risk kindergarten children

Jill E. Feller

*Eastern Illinois University*

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**Factors Influencing Early Literacy Skill Acquisition  
Among At-Risk Kindergarten Children**

BY

**Jill E. Feller**

**THESIS**

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF

**Specialist in School Psychology**

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY  
CHARLESTON, ILLINOIS

2007  
YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING  
THIS PART OF THE GRADUATE DEGREE CITED ABOVE

March 23, 2007  
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## Abstract

The No Child Left Behind Act of 2001 placed federal mandates on education in which all children will be expected to read grade-level text by the 3<sup>rd</sup> grade in the academic year of 2013-2014. Risk factors that can be linked to interventions in order to reach the goals of NCLB were investigated. In this study, the risk factors of parental involvement (Reading Minute Index), parental literacy interaction style (Home Questionnaire), and Overactive and Underactive problem behaviors (ASCA composite scores) were analyzed in relation to the Dynamic Indicators of Basic Early Literacy Skills kindergarten spring benchmarks.

This study was conducted in order to: a) examine which risk factors most predict early literacy risk status in kindergarteners and b) compare the saliency of risk factors between kindergarteners scoring in the at-risk range on DIBELS spring benchmarks and their non-risk peers (meeting benchmark). Results revealed that parental literacy interaction style was the most predictive of early literacy risk status on DIBELS. This factor was followed by ASCA Overactive problem behaviors and ASCA Underactive problem behaviors. Significant differences were found between DIBELS' high-risk and non-risk groups along with DIBELS' some-risk and non-risk groups on parental literacy interaction style. Furthermore, significant differences were found between DIBELS' high-risk group and non-risk group among the risk factors of ASCA Overactivity and ASCA Underactivity.

## Introduction

*Legislation and Early Literacy*

“In order to make sure that children are not simply shuffled through the system, we must measure. We must determine what needs to be corrected early, before it’s too late” (NCLB; Draft and Guidance, 2003). In 2003, President George W. Bush stated these words in an attempt to challenge the United States’ educational system into the reforms mandated by the No Child Left Behind Act (NCLB) of 2001. Although he stated this two years after the initial signing of NCLB, his words captured the push of educational research that proliferated from the legislation. These resulting investigations of our children’s achievements brought many of this nation’s literacy problems to light and sparked new ways of monitoring academic progress in the classrooms of America.

To facilitate a greater appreciation of the educational problems faced in the United States and, in particular those related to early literacy, the government supported a national reading assessment in 2002. This research, spearheaded by the National Association of Educational Progress (NAEP; Rathvon, 2004) revealed that 36% of all fourth graders scored at Below Basic Level in reading, thus indicating that they were unable to read and comprehend grade-level text. Furthermore, 60% of African American students, 56% of Hispanic students, and 49% of Alaskan native/Native American students scored Below Basic Level. Research years earlier had cited similar concerns; however, not until NCLB was there a legal mandate to effectively teach all children to learn to read.



For example, studies by Juel (1988) nearly 15 years prior to the NAEP data, indicated that deficits in reading abilities in the first grade impacted reading skill development all the way up to the fourth grade. Results from Juel's research indicated that 88% of children in the lowest quartile in reading comprehension at the end of 1<sup>st</sup> grade remained below the 50<sup>th</sup> percentile at the end of the 4<sup>th</sup> grade. Research such as this, combined with that of the NAEP (Rathvon, 2004) supported Congressional concerns about literacy among American children. This encouraged more effective measures of instructional accountability which accompanied NCLB.

According to NCLB, the federal government has given all U.S. school districts a deadline for achievement of national standards. By the school year of 2013-2014, nearly all students in the United States must meet proficiency in reading (and math) as determined by the national benchmarks of NCLB (United States Department of Education, Retrieved 2005). Specifically, *all* children must demonstrate the ability to read grade-level text by the 3<sup>rd</sup> grade. Due to the overwhelming nature of such a challenging task, state governments have been forced to establish benchmarks for their schools to reach each year, up until the 2013-2014 deadline.

Most states, like Illinois, use standardized tests, such as the Illinois State Achievement Test (ISAT), to measure progress toward the goals of NCLB (Illinois State Board of Education, Retrieved 2005). Each year, schools utilize these standardized assessments to measure a specified percentage of progress toward the proficiency benchmarks. If they do not meet their progress goals, the schools face placement on probationary status at the state level and risk national press on the federal "report card." According to the Illinois State Board of Education (2005), those Illinois schools that do

not meet adequate yearly progress toward achievement of proficiency standards are placed on the Academic Watch List their first year. Those not meeting the standards for two consecutive years are placed on the Academic Warning List. Placement on the Academic Warning List comes with many costs, including: negative press (both at the local and state level), demands of creating a school improvement plan, the potential loss of government funding, and ultimately, the potential reorganization of the school's faculty and students.

Currently, over 20% of Illinois' 4,402 schools are on these probationary academic lists. Specifically, 540 schools are on the Academic Watch list, and 401 are on the Academic Warning list (ISBE, Retrieved 2005). By the educational year of 2005-2006, schools in Illinois must reach 47.5% proficiency on ISAT scores (grades 3, 4, and 5). At this time, nearly one-third (31%) of the state's 893 school districts have not met this goal (ISBE, 2005).

#### *Curriculum-Based Measurement and Early Literacy Skills*

In order to accomplish the demands of NCLB, many states have turned to curriculum-based measurement as a means of monitoring academic student progress. According to Hosp and Hosp (2003), curriculum-based measurement is designed to be an objective, ongoing measurement system of student outcomes, which facilitates improved instructional planning. It involves the use of a set of standardized procedures to assess ongoing student performance on long-term goals, such as learning to read.

Research on curriculum-based measurement systems and on the skills needed for early literacy has brought exciting new perspectives and methodologies to our schools (Langdon, 2004). The National Research Council (NRC; 1998) and The National

Reading Panel (NRP; 2000) have identified, through metanalysis of the experimental research on reading, those skills, which should be targeted by early instruction in order to achieve reading fluency by the 3<sup>rd</sup> grade (thus meeting national standards). Five critical skills have been identified through this research: (1) *phonemic awareness* (the ability to hear and identify sounds 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), and (5) *comprehension* (the ability to understand and gain meaning from what has been read) (Rathvon, 2004). Research suggests that in kindergarten, skill acquisition needs to be targeted in the areas of phonemic awareness and beginning phonics skills. Each year skills sequentially build until reading proficiency is gained with connected text. Consequently, curriculum-based tests have been created to measure progress in each of these literacy areas along a developmental trajectory from kindergarten to the third grade (Rathvon, 2004).

At least one of these CBM procedures, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Kaminski & Good, 1998), has demonstrated a link to reading competence and national high-stakes testing at the end of 3<sup>rd</sup> grade (Good, Simmons, & Kame'enui, 2001). In Illinois, DIBELS has also been correlated with the Illinois State Achievement Test (ISAT), used to determine proficiency in the benchmarks of NCLB (McCormick, Havey, & Haack, 2005). Due to DIBELS' easy, no-charge internet accessibility, and the relatively simple administration process, many schools across Illinois and the United States as a whole, have recently employed its use. DIBELS, and other curriculum-based measures like it, provide early screening methods and tools for

progress monitoring. CBM results facilitate instructional decision-making of those students identified as falling behind on particular early literacy skills. Who are those students at-risk for early literacy failure and targeted by the NCLB legislation? What are the characteristics that contribute to struggles in early literacy skill acquisition?

#### *Predictors of Early Literacy Failure*

The National Institute of Mental Health (NIMH, 2005) has listed a multitude of contributing factors for early literacy (and general academic) failure. These include sociological factors, as well as family and child factors. Particularly, the NIMH lists minority status, low socioeconomic status (SES), and limited English speaking ability as sociological risk factors. Family factors have been related to difficult parent-child relationships, family adversity, and limited maternal education level. Child risk factors include: low birth weight, prenatal and neonatal problems, cognitive deficits, and behavior problems often associated with inattention, hyperactivity and impulsivity.

In studying this list, educators and researchers could easily become discouraged by the number of children falling into the risk categories; in fact, many schools are largely composed of these at-risk students. When seeking design interventions to mediate these risks, the NIMH's list appears beyond the scope of a local school district. In fact, most research has opted to focus on interventions spanning the entire risk population, a shotgun approach usually targeted at low SES populations (Leslie & Allen, 1999). However, a clearer understanding of students at-risk for reading failure may provide useful insight to more successful literacy support programs and instruction.

*Breaking Down Sociological and Parent Factors*

Research cited by Mikulecky (1996) suggested that parental involvement, in combination with parental interaction style, might be more telling than the NIMH's list of demographic variables/risks which included: low parental education level, minority status, and low SES. In Mikulecky's report, these two variables appeared to pull most of the variance within several of the sociological and family risk factors listed by the NIMH (Mikulecky, 1996).

*Parental Involvement.* Leslie and Allen (1999) extended research by Snow, Barnes, Chandler, Goodman, and Hamphill (1991), which indicated that parental involvement was a primary factor in determining children's academic success or failure. Leslie and Allen (1999) found that the degree of parental involvement in a reading intervention program for children in grades 1 through 4 who were non-readers or were behind by one or two grade levels predicted children's reading growth. In their study, children received small-group literacy instruction from teacher – practicum students after school for 10 weeks. This continued each semester until the children reached grade level. Meanwhile, parents were involved by attending literacy events at the school and reading to their children at home. Four literacy events were sponsored at the school each semester. These events centered around teaching parents strategies to use when helping their children read, handouts on favorite children's books, conferences with the tutors to explain and model strategies, and ceremonies to recognize their child(ren)'s efforts and progress. Books at the independent or instructional levels were chosen by the children to take home and read independently or with their parents. Books that were above the children's instructional reading level but were within their interests were also selected for

*the parents* to read to their child(ren). In this study, parental involvement was measured by attendance at the literacy events and number of words read with the child. Those children enrolled in the project made more progress after one year than a group of untutored children. Further, those children who returned (minutes spent reading) forms signed by their parents, validating that they had read with their parents at home, made more progress than those who did not return forms.

Parental involvement was further correlated with children's academic achievement and found to compensate for ineffective classroom instruction in research by Snow et al. (1991). Moreover, Senechal and LeFevre (2002) found that parental involvement, particularly reading with the child (in first grade) demonstrated association with the development of emergent literacy skills. These literacy skills, in turn, directly predicted word reading at the end of the first grade and indirectly predicted reading at the end of the third grade. Additionally, the level of word reading at the end of first grade directly predicted reading comprehension at the end of the third grade. This relationship sustained even after controlling for the level of parent education and the child's initial levels of phonemic awareness.

*Parental Style of Literacy Interaction.* Research by Baker, Serpell, and Sonnenchein (1995) indicated that parent-child literacy relationships are bi-directional among emergent readers. Children who are more fluent and positive about reading have been found to originate from parent-child pairs who viewed reading as fun (Lancy & Bergin, 1992; Frosch, Cox, & Goldman, 2001). Those children of at-risk status demonstrate a more negative view of reading and originate from parent-child pairs who focus on explicit instruction and decoding skills. Parents of fluent readers encouraged

questions and humor while reading and focused on the concepts behind the stories rather than the decoding of specific letters to make words. This approach has been tied with more successful reading experiences (Lancy & Bergin, 1992) and is most likely tied to a more enjoyable occurrence within the home that the child is likely to recreate on his or her own.

In a comprehensive study of more than 40 families, researchers examined the differences between middle and low-income families of kindergarten children (Baker, Serpell, & Sonnenchein, 1995). Results indicated minor differences in the frequency of reading between the groups, but significant differences in the level of play with print and the amount of independent reading completed by the kindergarteners. Furthermore, these researchers found that low-income parents were much more likely to emphasize explicit instruction and decoding of words during their literacy interactions with their children. However, further research cited in Mikulecky (1996) indicated that parents of good readers did not focus on decoding and explicit instruction; instead, they used expansionist strategies. These tactics included graduated support or scaffolding of children's attempts to understand stories. Over time, the parent took a less active role in storytelling and encouraged the child to actively engage in the reading process, thus formulating his or her own conceptual understanding of the story.

The extensive research cited in Mikulecky (1996), suggested that parental involvement and parental interaction style may contribute to most of the variance within several of the sociological and family risk factors listed by the NIMH (2005), particularly those of maternal education and SES. Because schools may have the ability to

implement interventions to counteract these variables, we need to investigate them further.

### *Problem Behaviors*

Children in the first grade with behavior problems tend to demonstrate deficient academic skills - particular to the area of reading, lower rates of time engaged in academics, and below average achievement (Lane, Wehby, Menzies, Gregg, Doukas, & Munton, 2002). In an extensive literature review and meta-analysis, Nelson, et al., (2003) found that, of the factors cited in NIMH's list (2005), behavior problems served as the leading risk factor in the influence of the treatment effectiveness of early literacy interventions. Behavior problems can be defined as those early indicators of emotional and behavioral disorders: hyperactivity, aggression, conduct problems, anxiety, depression, and somatization. Nelson and colleague's literature review (2003) indicated that 60 to 100 percent of children with problem behaviors, indicative of emotional and behavioral disorders (EBD), evidenced reading failure. Furthermore, approximately 3 out of every four children with EBD exhibited language deficits specific to phonological processing. These prevalence rates of reading problems and phonological processing problems increased in frequency over time.

Research by Achenbach (1990) suggested that behavior problems in children, or child psychopathology, should be split into two classifications: externalizing (overactivity) and internalizing (underactivity). Externalizing or overactive behaviors are those that extend to other people and are disruptive to the environment. Conversely, internalized problems serve as those feelings and resulting behaviors that are directed inward and characterized by decreased activity and over-controlled behaviors. Overall,



both overactive and underactive behaviors have demonstrated a negative impact on classroom instruction and achievement (Nelson & Benner, 2004).

*Overactive (Externalizing) Behaviors.* Research has indicated a strong relationship between deficits in reading achievement and externalizing behavior patterns (Lane et. al, 2002). Studies have suggested that overactive behaviors interfered with attention and often resulted in punishments that contributed to less classroom involvement. Particularly, Lane and colleague's research (2002) indicated that first-grade children with externalizing problems experienced difficulty in the areas of decoding and comprehension, both identified by the NRC (1998) and the NRP (2000) as key skills required for early literacy acquisition.

Research has been inconclusive about the directionality of this relationship between literacy problems and problem behavior. It is also uncertain as to which interventions are effective for these children. Studies completed by Lane and colleagues (2002) demonstrated that concentrated, individualized interventions, targeted at the literacy skills identified by NRP (2000) demonstrated both early literacy growth and a decrease in acting out behaviors. Meanwhile, Nelson and colleagues (2003) cited research, which claimed that children with problem behaviors did not benefit from traditional early literacy interventions, even in the one-to-one instructional format. Although the results of interventions are inconclusive (Nelson et al., 2003), the data demonstrate that externalizing behaviors interfere with literacy skill acquisition. However, it is unknown whether overt behavior problems in children are more predictive of early-literacy risk status than low parental involvement or little parent literacy interaction.

*Underactive (Internalized) Behaviors.* Two developmental pathways linking behavior problems associated with the internalizing dimension to later academic risk are suggested by the literature. First, moderate to strong correlations between internalizing behavior problems and daily classroom performance have been reported in clinical samples (Rapport, Denney, Chung, & Hustace, 2001). This research suggested that withdrawal and anxiety contributed to less participation in the classroom activities. Second, cognitive pathways involving general abilities (intelligence) and specific aspects of cognitive functions (vigilance, memory, information processing) have been implicated as correlates to academic risks in children with internalizing problems. Consequently, children with internalizing problems exhibit less cognitive interaction with classroom instruction. Therefore, Rapport and colleagues (2001) have hypothesized a dual pathway model, linking the impact of internalizing behavior problems to the acquisition of academic skills and retention of information. Like overactive behaviors, underactive behaviors indicative of internalizing problems interfere with early literacy skill instruction, yet it is unknown which is a greater problem.

#### *Significance of the Study*

Studying the factors that best predict problems in early literacy skill acquisition, particularly among "at-risk" kindergarten children, is important for several reasons. First, literacy is a lifelong tool, which aids future achievement and prosperity. Schools understand this and, in turn, spend precious money attempting to overcome identified risk factors, in the hopes of improving children's literacy skills. The knowledge of which specific factors are most salient to literacy failure could improve the scope and focus of interventions, making them more targeted and potentially, more fruitful. This research

could contribute to clarification of risk factors and aid development of effective interventions as schools strive to reach the goals of NCLB.

Second, according to the national benchmarks of NCLB (2001), schools must reach 100% proficiency in reading for 3<sup>rd</sup> graders by the academic year of 2013-2014, or face potential financial withdrawal of the federal government (NCLB; Draft and Guidance, Retrieved 2005). These mandates do not allow schools to pick and choose which students should take the standardized tests. All children, regardless of risk factors, must pass. Schools may utilize risk lists like those produced by the NIMH to design interventions targeted at mediating risks and maximizing child performance. However, past focus on the demographic variables that contribute to literacy failure does not easily tie to intervention designs feasible at the local school level. How is a school to intervene with socioeconomic status or maternal education? Therefore, research needs to shift focus to those factors outside of the traditional demographic risks and onto issues such as the level of parental involvement, parental interaction style, and student problem behavior, which more easily translate to intervention designs.

This study investigated child problem behaviors, parental involvement, and parental interaction style as predictors of early literacy skill acquisition among “at-risk” kindergarten children based on low SES. The parameters of the Dynamic Indicators for Basic Early Literacy Skills (Kaminski & Good, 1998) were used to describe early reading skills performance. Child problem behaviors (overactive/ externalizing and underactive/internalizing) were defined through the use of composite scores derived from the Adjustment Scales for Children and Adolescents (ASCA, McDermott, 1993). Parental involvement, as defined for the purpose of this research, was the amount of

literacy interaction between the child and the parent/guardian specified by the number of minutes spent reading together. Style of literacy interaction was defined as the approach and technique used in literacy dialogues between the parent/guardian and child and was measured by a home questionnaire.

### *Hypotheses*

1. It is predicted that overactive problem behaviors will best predict at-risk status on early literacy skills as measured using DIBELS than other variables.
2. Between the family factors, it is predicted that parental involvement will be a stronger predictor of early literacy risk status than parental literacy interaction style.
3. Children determined more at-risk by DIBELS instructional recommendations will demonstrate more behavioral problems than their non-risk peers.

## Method

### *Participants*

Two primarily low SES elementary schools in a Midwestern city school district participated in this study during the spring of 2006. At the time of the study, both schools were listed on the Academic Watch List. Participants were 112 kindergarteners from six different classes. Across the classes, the subject pool was comprised of 57 African –American students, 37 Caucasian students, and 12 Hispanic students. Fifty-three percent of the students were male; 47% were female. According to school records, approximately 86% of the students within the schools qualified for “free and reduced” lunch status (an indicator of socioeconomic need). Only one student within the data pool received special education via pullout services.

### *Design*

Predictors of early literacy skill acquisition were: parental involvement, parental literacy interaction style, and ASCA teacher report of underactive problem behaviors and overactive problem behaviors. The predicted variables included DIBELS performance on kindergarten measures of: letter naming fluency, phoneme segmentation fluency, and nonsense word fluency. Due to the variables’ highly correlated nature, the overarching variable of “instructional recommendation” was used to indicate instructional risk status. According to DIBELS decision rules (Good, Simmons, Kame’enui, Kaminski, & Wallin, 2002) the overall predicted variable of instructional recommendation is the product of a weighted equation involving the above-mentioned factors of early literacy skills. Instructional recommendation falls into three categories based upon their national

database: benchmark (no risk/greater than the 40<sup>th</sup> percentile), strategic (some risk/the 20<sup>th</sup> to the 40<sup>th</sup> percentile), and intensive (high risk/less than the 20<sup>th</sup> percentile). (See Figure 1, Diagram of the Predicted Relationship).

### *Measures*

This researcher created two measures for the study, the Reading Minute Index (to measure parental involvement) and the Home Questionnaire (to measure parental literacy interaction style). This study also used two existing measures: the Adjustment Scales for Children (ASCA; McDermott, 1993) and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Kaminski & Good, 1998).

The Reading Minute Index measured the predictor of parental involvement as defined by the amount of reading time between the child and parent/guardian. This measure generated an overall tally of minutes spent reading with the child throughout a four-week period of this study. The Reading Minute Index forms contained seven sections denoting the seven days of each week (See Appendix A, Reading Minute Index). In each slot (or day), parents/guardians documented the number of minutes spent reading with the child and signed the form prior to collection at the end of the week. At the end of the study, the number of minutes was totaled.

The Home Questionnaire was developed to measure the predictor of parental style of literacy interaction as defined by the approach and technique used in literacy interaction between the child and parent/guardian. The Home Questionnaires were self-report measures, which required the “parents” to rate their levels of elaborative and discussion-focused interaction during shared book reading. This measure had six items and was scored on a four-point Likert-type scale ranging from 1 (rarely) to 4 (nearly all

the time) (See Appendix B, Home Questionnaire). Higher scores on the questionnaire indicated a more elaborative/discussion-oriented interaction style. The highest possible score was 24 and the lowest possible obtained score was 6.

The Adjustment Scales for Children and Adolescents (ASCA), developed by McDermott (1993), is a 96-item tool designed to measure behaviors indicative of child psychopathology. It is designed to be completed by the child's homeroom teacher after a minimum of 40-50 school days. The items of the scale are assigned to six core syndromes and two supplementary syndromes of behavior pathology. These core syndromes can be combined to form an Overactivity Adjustment Scale and an Underactivity Adjustment Scale. The four core syndromes, which contribute to the Overactivity Scale include: Attention-Deficit Hyperactive, Solitary Aggressive (Provocative), Solitary Aggressive (Impulsive), and Oppositional Defiant. The *T* scores of the Overactivity Adjustment Scale served as the measure of overactive problem behaviors. Likewise, the two core syndromes of Diffident and Avoidant contribute to the Underactivity Scale; *T* scores of the Underactivity Adjustment Scale served as the measure of underactive problem behaviors.

According to McDermott (1993), these scales and their core syndromes are reliably identified across all youths aged 5 through 17 years, across males and females, and different racial/ethnic groups. The Overactivity Adjustment Scale demonstrates internal consistency of .92, while the Underactivity Adjustment Scale exhibits internal consistency at .84 for children ages 5-11. Furthermore, interrater agreement coefficients are .81 for the Overactivity Scale and .84 for the Underactivity Scale. The ASCA scales

also demonstrate overall stability with the Overactivity Scale indicating test-retest coefficients of .75 and the Underactivity Scale measuring at .79.

The ASCA contains 156 behavioral descriptions with reference to 29 specific social, recreational, or learning situations. These situations serve as scenarios in which the youth's adjustment to authority, peers, smaller/weaker children, and other situations may be observed (McDermott, 1993). Examples of situations include: answering teacher's questions, working alone, and controlling outbursts. For each situation, the teacher indicates the youth's behavior over the past two months by marking none, one, or more of the behavioral descriptions involved in that situation. These marks are tallied under the core syndromes to form raw scores for the Overactivity and Underactivity Scales. The raw scores correspond to a *T* score derived from the ASCA conversion chart. These *T* scores provided the measure of overactive and underactive problem behaviors in this study.

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) developed by Kaminski and Good (1998), is a set of brief, individually administered fluency-based procedures for monitoring the development of early literacy skills for children from preschool through the third grade (Rathvon, 2004). It utilizes benchmark assessments administered to all students three times each school year (See Figure 2). Those skills measured by DIBELS for the spring benchmark of the kindergarten year include: Letter Naming Fluency, Phoneme Segmentation Fluency, and Nonsense Word Fluency.

Letter Naming Fluency measures the alphabetic principle. In this subtest, the child is asked to name uppercase and lowercase letters arbitrarily arranged on a page. The score is the number of letters correctly named in one minute (Rathvon, 2004).



Phoneme Segmentation Fluency measures phonemic awareness. This subtest requires the child to segment three- and four- phoneme words spoken by the examiner into individual phonemes (Rathvon, 2004). The score is the number of correct sound segments produced per minute. The factor of Nonsense Word Fluency also measures the alphabetic principle. This subtest requires the examiner to present the child with two- and three-phoneme pseudowords on a sheet of paper. The score is the number of correct letter sounds per minute, as indicated by individual sounds or reading of the whole word (Rathvon, 2004). Reliability estimates vary in number by subtest, but range between .80 - .90. No measures of interrater reliability have been presented in any of the articles published thus far.

#### *Procedure*

The researcher met with kindergarten teachers within a small Midwestern city who were willing to participate in this study. After discussion of the research, expectations of data collection, and attainment of official permission by the respective building administrators, the researcher began data collection. In four of the classrooms (all within the same school), the researcher met with the kindergarteners and explained that they had the opportunity to help with a "big assignment." Students were told that each week, they would be given papers to take home. On them, they would have their parents/guardians record the number of minutes they spent reading outside of school. Regardless of the number of minutes spent reading, the students would be given a reward each week by the researcher, just for return of the Reading Minute Index. In the other two classes, the teachers themselves opted to explain the project and were provided rewards that they dispersed to the students each week. After the initial explanation, the

permission form, attached to the Home Questionnaire, and an explanation of the experiment/data collection was given to each student. Those students who returned the permission forms with signed consent (112 of 141 possible students) participated in the study during the late winter/early spring months.

Reading Minute data were collected for a total of one month. These indices were turned in weekly to the researcher (in four classrooms) and the kindergarten homeroom teacher (in two classrooms). Following the low return of the first week's Reading Minute Indices, the researcher contacted nearly all parents/guardians by telephone to encourage participation. Furthermore, at the end of each week (Fridays), reminder notices were sent home with children to return Reading Minute Indices the following Monday. Each returned Reading Minute Index and Home Questionnaire was rewarded, even if the child returned the form late. Rewards included: candies, pencils, silly straws, erasers, crayons, and snacks given in an "awards ceremony" (in front of their peers) each week. Those children who returned *all* forms were rewarded with a pizza party at the end of the data collection period (late spring).

During late spring, after the completion of reading minute data, homeroom teachers completed the Adjustment Scales for Children and Adolescents (ASCA; McDermott, 1993) for those children involved in the study. Completion of this scale required approximately 10-20 minutes per child on the part of the teacher. The data were then collected and scored by the researcher. Teachers who participated in the study were given a gift card for their efforts. From the presentation of the research project to collection of the final data, the data collection period of the study took approximately four months.

One district employee completed all DIBELS spring benchmark screenings for every classroom in late April. This person was trained on DIBELS data collection prior to this study and had served as the DIBELS data coordinator for the district over several years, routinely collecting all data. After all data were entered and interpreted through the DIBELS website by the district DIBELS coordinator, the researcher analyzed it for the purposes of this study.

## Results

All analyses were performed using the Statistical Packet for the Social Sciences-12<sup>th</sup> Edition (SPSS, 2003). A stepwise multiple regression analysis was conducted to examine how the following factors predicted overall early literacy risk status for the DIBELS spring benchmark: parental involvement (Reading Minute Index), parental literacy interaction style (Home Questionnaire), ASCA Overactivity composite score, and ASCA Underactivity composite score. Early literacy risk status was scored such that the higher the number, the more literacy risk (1 = no risk/benchmark, 2 = some risk/strategic intervention, 3 = high risk/intensive intervention). Results show that parental literacy interaction style, the ASCA Overactivity composite score, and the ASCA Underactivity composite score accounted for 21.7% of the variance in overall early literacy risk status,  $F(3, 82) = 8.87, p = .000$ .

Overall, parental literacy interaction style as measured by the Home Questionnaire accounted for most of the variance (12.3%),  $p = .002$ . The ASCA Overactivity score accounted for an additional 5.4% of the variance,  $p = .012$ , and the ASCA Underactivity composite score explained an additional remaining variance of 4% in overall early literacy risk status,  $p = .024$ . Parental involvement (Reading Minute Index) did not contribute significantly to the variance in early literacy risk status. A summary of the results of the multiple regression analysis is found in Table 1.

Table 1

*Summary of Multiple Regression Analysis for Variables Predicting Overall Early Literacy Skill Risk Status (N = 86)*

Variable	<i>B</i>	<i>SE B</i>	$\beta$
Parental Literacy Interaction Style (Home Questionnaire)	-0.50	0.16	-0.31**
ASCA Overactivity Score	0.01	0.01	0.25*
ASCA Underactivity Score	0.02	0.01	0.22*

*Note.*  $R^2 = 0.22$ . Overall early literacy risk status was scored on a 3-point scale with higher scores indicating increased risk.

\*  $p < .05$ , \*\*  $p < .01$

In order to further examine the multiple regression results, one-way analyses of variance were conducted on the overall early literacy risk status scores for the DIBELS spring benchmark and each of the significant contributors to risk status. At an alpha of .05, results indicate significant differences between the DIBELS' risk groups and the parental literacy interaction style (Home Questionnaire),  $F(2, 102) = 6.76, p = .00$ . The parental literacy interaction style accounted for 12% of the total variance in the DIBELS' spring benchmark scores. A post-hoc Tukey's HSD test indicated that students who scored in the intensive instructional recommendation category (high risk) on the DIBELS' spring benchmark engaged in significantly less elaborative discussion with their "parents" while reading than those students who were identified as in need of strategic instruction (some risk) ( $p = .01$ ) or those who met benchmark (no risk) ( $p = .00$ ).

At an alpha of .05, results of the one-way analysis of variance show significant differences between the DIBELS' risk groups and the teacher ratings of Overactivity on the Adjustment Scales for Children and Adolescents (ASCA),  $F(2, 100) = 5.26, p < .01$ . The teacher rating of Overactivity accounted for 5.4% of the total variance in the DIBELS' spring benchmark scores. Results of a Tukey's HSD test indicate that students who scored in the DIBELS' intensive intervention (high risk) category were also rated significantly higher in Overactivity by their teachers than their non-risk peers (those who met the DIBELS' spring benchmark) ( $p = .01$ ). Students ranked in the strategic intervention category (some risk) on DIBELS' spring benchmark did not have significantly different ASCA Overactivity scores than those students who scored in the intensive intervention category (high risk) ( $p = .11$ ) or the benchmark category (non-risk) ( $p = .57$ ).

Furthermore, at an alpha of .05, results of a one-way analysis of variance show significant differences between the DIBELS' risk groups and teacher ratings of Underactivity on the ASCA,  $F(2, 100) = 4.99, p < .01$ . Teacher ratings of Underactivity accounted for 4% of the total variance in the DIBELS' spring benchmark scores. Results of a Tukey's HSD test indicate that students who scored in the intensive intervention category (high risk) on DIBELS were rated significantly higher on the Underactivity scale of the ASCA by their teachers than their peers who met the DIBELS' spring benchmark (non-risk) ( $p = .006$ ). Students ranked in the strategic intervention category (some risk) did not have significantly different ASCA Underactivity scores than those students who scored in the intensive intervention category (high risk) ( $p = .229$ ) or those who scored at benchmark (non-risk) ( $p = 0.291$ ). Table 2 summarizes the post-hoc tests.

Table 2

*Significant Post-hoc Tukey HSD Comparisons for Analysis of Variance for Overall Literacy Risk Status*

Tukey Comparison	<i>p</i>
Parental Literacy Interaction Style (Home Questionnaire)	Strategic/Some Risk vs. Intensive/High Risk .01 Benchmark/No Risk vs. Intensive/High Risk .00*
ASCA Overactivity	Benchmark/No Risk vs. Intensive/High Risk .01*
ASCA Underactivity	Benchmark/No Risk vs. Intensive/High Risk .01*

\* $p < .01$

## Discussion

According to the goals of NCLB, by 2013-2014 all children are expected to be reading grade-level text by the 3<sup>rd</sup> grade. In order to measure their progress on this goal, many schools have turned to curriculum-based measurement systems that are aligned with the research conclusions of the National Reading Panel (NRP, 2000). CBM tools such as DIBELS have been identified as holding validity evidence in connection to standardized tests used by states to measure progress toward NCLB's adequate yearly progress. Due to the high-stakes testing in schools, students at risk in early literacy are often targeted immediately for interventions and frequently the subject of costly literacy programs. However, to date, most research has indicated risk-status by focusing on relatively unchangeable demographic data, e.g. low SES. In the current political climate focus on risk factors outside of the local district's influence will not produce the results needed to make adequate yearly progress. Focus must shift to those risk factors which can be directly linked to intervention.

This study was conducted in order to: a) examine which specific risk factors most predict early literacy risk status in generally at-risk kindergarteners and b) compare the saliency of risk factors between these kindergarteners scoring in the at-risk range on DIBELS spring benchmarks and their non-risk peers (meeting benchmark). Participants in this study comprised an overall at-risk population. Not only were many of the participants eligible for free and reduced lunch (indicative of low SES) but 61% of the participants were also minorities (51% African-American and 10% Hispanic). The



DIBELS data collected for the spring benchmark indicated that 64% of the kindergarteners were identified as in need of intensive or strategic literacy intervention (64% not meeting the DIBELS benchmark standard for the spring). This is in sharp contrast to the typical 40% risk group seen in national data (DIBELS, Retrieved 2007). Furthermore, high ASCA Overactivity composite scores indicated that 34% of the students fell within the at-risk or maladjusted range in comparison to 19% of the ASCA normative sample falling into these same categories. Specifically, 21% scored in the maladjusted range (within the clinical range) and only 4% of the normative sample scored in the maladjusted range (McDermott et al., 1993). Despite the generally at-risk status of this group of kindergarteners, 36% were meeting benchmark expectations on the DIBELS spring benchmark.

The first hypothesis of this study predicted that high scores on the Overactivity composite of the ASCA would best predict at-risk status on the DIBELS instructional recommendations. However, multiple regression analysis indicated that parental literacy interaction style, as measured by the Home Questionnaire, was most predictive of DIBELS risk status. ASCA Overactive problem behaviors ranked second in the risk model, followed by Underactive problem behaviors. As well, Overactivity scores were significantly higher for the highest literacy risk group (intensive intervention recommendation). This relationship indicated that the more maladjusted the students' externalizing behaviors were, the higher their risk of early literacy failure. Results of this study corroborate other research that has shown a strong association between inattention and overactive behavior problems in kindergarten/pre-kindergarten years and poor reading achievement in the early elementary years.

A study completed in 1999 by Lonigan, Bloomfield, Anthony, Bacon, Phillips, and Samwel indicated that problems of inattention were closely associated with less well developed emergent literacy skills among preschool children. They found that these results were particularly strong for children from middle-income families but slightly weaker for children from low-income families. Likewise, Lonigan et al. (1999) cited numerous studies that indicated a near 50% comorbidity rate between reading disabilities and attention deficit/hyperactivity disorder in school-age children. It is probable that this comorbidity between ADHD and reading disabilities diagnosed in later school years is tied to the correlation of Overactivity and low emergent literacy skills seen in this study and that of Lonigan et al. (1999) in early school years. Results of this study add more evidence to the theory that significant delays in emergent literacy skills observed among overactive preschool (Lonigan et al., 1999) and kindergarten children may mediate the link between ADHD and reading disorders observed in older children.

On the other side of the behavioral risk spectrum, those students with high ASCA Underactivity composite scores were also found to be associated with low emergent literacy skills on DIBELS. Results revealed an additional direct link between anxious-withdrawn (underactive) behavior problems and early literacy skills. Specifically, those students who scored highest in Underactivity also scored in the highest risk group (intensive intervention recommendations) on the DIBELS benchmarks.

Underactivity may be indicative of social withdrawal, depression, and/or anxiety; all of which can interfere with classroom learning. Rapport, Denney, Chung, and Hustace (2001) reported similar findings, specifically with children who exhibited significant levels of anxiety in combination with withdrawal. Their research indicated

that anxious/withdrawn children were likely to experience difficulties on classroom tasks and cognitive tests. Subsequently, they were more likely to demonstrate lesser levels of achievement in comparison with their peers. In 1972, Kohn and Rosman found that preschoolers rated by teachers as high on apathy-withdrawal characteristics earned lower academic grades in the first and second grade. Similarly, research by Green, Forehand, Beck, and Vosk (1980) indicated that teacher ratings of social withdrawal correlated negatively with student scores on standardized achievement tests. The results of this current study along with the previous research on underactive behaviors in the classroom reveal a continued correlation between anxious-withdrawn behavior problems and overall student achievement.

In this research the factor of parental involvement (Reading Minute Index) was hypothesized as more predictive of risk status on DIBELS benchmarks than the literacy interaction style of the parent. This prediction was not supported by the multiple regression analysis. Unlike the results of previous research (Leslie & Allen, 1999; Snow et. al, 1991; Senechal & LeFevre, 2002), parental involvement, as measured by minutes spent reading with “parents” outside of school, did not predict early literacy risk status in this study. Due to the logical tie between extra reading practice and improved reading outcomes, this result is surprising. However, there are several possible complications that may have affected the results. Most significantly, the methods used to measure parental involvement in reading may have contributed significant error to the measurement of parental involvement.

Similar to the methods used by Leslie and Allen (1999), parents (or guardians) in this study recorded their own minutes spent reading outside of school on Reading Minute

Indices. At the end of each week, students turned in the indices for a reward (not contingent upon the amount of minutes documented on the chart). Unfortunately, this method posed several problems. Initially, parents did not return the indices weekly as requested. Therefore, after parents were contacted and reminded that their children would receive a reward for return of the indices (regardless of time spent reading), many of these sheets were returned. However, at times the minutes recorded on the charts appeared to be exaggerated. For example, when questioned about the books they read, some students could not recall reading with their parents; nonetheless, their charts reported nearly an hour of shared-book reading each night. At other times, students turned in more weekly indices than there were weeks in the study. In those cases, the data from the initial sheet were logged and that of the second was discarded. Although these events were not widespread occurrences, they did contribute significant doubt to the validity of the minutes recorded on the charts and therefore the validity of the parental involvement data all together.

Contrary to expectations, parental literacy interaction style, as measured by the Home Questionnaire, was the most predictive of early literacy risk status on DIBELS. On the Home Questionnaire, parents/guardians ranked their level of elaborative discussion with their children during shared-reading activities. Children whose parents reported more discussion about the story (prediction, tying events with real life experiences, and explanation of difficult words) exhibited better early literacy skills on the DIBELS spring benchmark. Although research cited by the National Reading Panel (2000) documented that classroom instruction of phonics (direct instruction of letter-sound correspondence, phoneme segmentation, etc.) is linked with emergent literacy

skills, the results of the Home Questionnaire were consistent with the literature indicating that at-home support which is elaborative promotes success in classroom literacy instruction. However, it is possible that phonics skill instruction could have been an adjunct to or couched within the more elaborative interaction style that the Home Questionnaire targeted.

The correlation between emergent literacy skills and play with print, as indicated by elaborative discussions during story time, were consistent with results reported throughout early literacy research, as well as indicative of the research supporting the development of reading comprehension skills. The National Reading Panel (2000) cited numerous research studies that targeted elaborative discussion and play with print as useful tools for comprehension-building instruction. The Home Questionnaire used in this study largely measured skills grounded in research that supported reading comprehension: questioning strategies, linking text with personal experience, vocabulary development, etc. Nonetheless, children who scored higher on levels of elaborative discussion with their “parents” also scored higher on the emergent literacy skills benchmarks. These results suggest that reading activity, when made interactive between text, reader, and more advanced reader, also supports emergent literacy skills. Furthermore, these results hold credence to long-standing theories of scaffolding first purported by Vygotsky (Berk, 2002). Vygotsky’s research indicated that providing supported learning (or scaffolding) to a student with less well-developed skills, optimally improved the student’s skill development.

Just as Mikulecky (1996) found that parents who read to their children using expansionist strategies were linked with less literacy risk, so do the results of this study.

These findings lead to the conclusion that methods of reading with children should be further investigated. If teaching parents *how* to read with their children could remediate many of the demographic and family risks (low SES), then perhaps our school-based interventions could be more fruitful. As stated, this research was conducted within a highly at-risk population. Future research should target higher SES populations to see if similar results would be found in relation to the type of literacy interaction at home. If so, this would provide further evidence that teaching literacy interaction strategies could be a useful intervention to remediate literacy risk.

Further analysis of DIBELS winter benchmark data versus the spring benchmark data from this study showed that those students in the highest risk category at the winter benchmark remained in the highest risk category at the spring benchmark. Also, the most severe risk group from this study increased by 13% between the winter and spring benchmarks. Future research should examine the classroom instructional techniques and the teacher variables that mediate early literacy risk. Investigations into targeted literacy interventions with these at-risk groups could lead to interesting results. Furthermore, investigations into interventions that mediate the overactive problem behaviors should be researched. In addition to school instruction and behavioral interventions, family support may help to reduce at-risk status. Although the risk factor of parent involvement did not serve as a significant factor in this study, future studies should continue to analyze this factor with an improved method of measurement.

In sum, the successful acquisition of reading skills is a complex issue involving behavioral considerations, family support, and classroom instructional variables that were not addressed in this research study. Focus on specific risk factors appears to be more

informative for the design of future intervention strategies. Within this generally at-risk population, low levels of elaborative discussion during shared-reading at home and high levels of overactive problem behaviors at school were clearly associated with high-risk early literacy status. Future research should continue to investigate specific risk factors that can be directly linked to local interventions within an overall at-risk population. These may spur programs, which could produce lasting changes in students' reading skills. With this change, schools may not only make progress toward the goals of NCLB but also improve the literacy skills of American students.

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Figure 1

**DIAGRAM OF THE PREDICTED RELATIONSHIP**

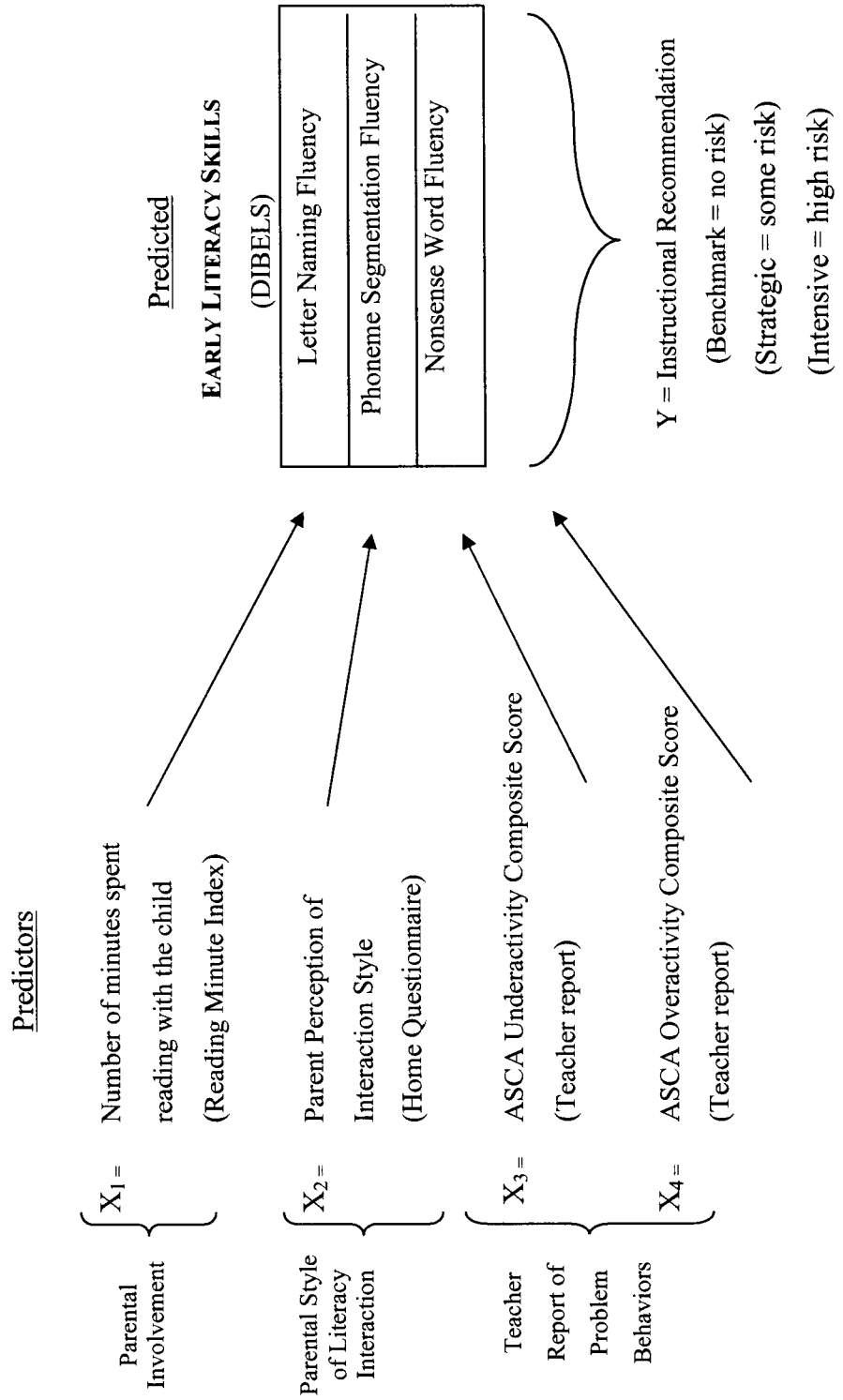


Figure 2

DIBELS Measures by Grade and Administration Window (Rathvon, 2004)

Pre-Sch.		Kinder.		1 <sup>st</sup> Grade		2 <sup>nd</sup> Grade		3 <sup>rd</sup> Grade		
Beg.	Mid.	Beg.	Mid.	Beg.	Mid.	Beg.	Mid.	Beg.	Mid.	End
Initial Sound Fluency										
Letter Naming Fluency										
Phoneme Segmentation Fluency										
Nonsense Word Fluency										
Oral Reading Fluency										
Retell Fluency										
Word Use Fluency										

## Appendix A

**Sample Reading Minute Index**

Sat	Sun	Mon	Tues	Wed	Thurs	Fri
10	45		25			
Signature...Mrs. Jones ... Total min: <u>80</u>						

## Appendix B

Child No.: \_\_\_\_\_

Current Address: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Return by : \_\_\_\_\_

Date: \_\_\_\_\_

**Directions: For each question please circle the best response.**

1. When you read a story to your child, do you talk with him/her about what is happening in the story?

Rarely            Once in a while            Often            Nearly all the time

2. While reading a story with your child, do you explain words or events that your child may not understand?

Rarely            Once in a while            Often            Nearly all the time

3. Does your child ask questions or tell you things about the story when you read to him or her?

Rarely            Once in a while            Often            Nearly all the time

4. Do you and your child enjoy talking about stories?

Rarely            Once in a while            Often            Nearly all the time

5. Does your child read or pretend read (from memory) story books to you?

Rarely            Once in a while            Often            Nearly all the time

6. How often does your child ask you to read with him/her?

Rarely            Once in a while            Often            Nearly all the time

Thank you for your time. Please return this to your child's teacher as soon as possible.