ACADEMIC AND BEHAVIORAL CHARACTERISTICS OF EARLY ELEMENTARY STUDENTS THAT MAY PREDICT FUTURE READING DISABILITIES
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Abstract

A literature review was conducted to determine which academic and behavior characteristics in first graders might predict a future learning disability. The studies in this review focus on Dynamic Indicators of Basic Early Literacy Skills (DIBELS) and Response to Intervention (RTI) as they relate to academic or problem behaviors that may negatively affect reading outcomes. Functional Behavior Assessments and Positive Behavior Intervention and Supports (PBIS) studies that address behavior issues in schools were reviewed. The DIBELS Oral Reading Fluency (ORF) subtest was shown to be a predictor of reading success. Task avoidance is commonly seen in children with poor reading outcomes. Problem behaviors and reading outcome are often related. Intervention that addresses both simultaneously is recommended.
Chapter I: Introduction

Predicting a learning disability may potentially prevent a learning disability. If we can identify warning signs that will allow us to intervene as early as possible, a learning disability might be avoided. The focus of this research project was to determine what warning signs might help us identify first graders (early elementary students) who would benefit from intervention. Are there certain observable behaviors and/or academic problems that could help school professionals decide who needs intense intervention before an academic deficit becomes too great? The goal of this paper is not to identify a learning disability, but to identify the warning signs in a young child that may lead to a learning disability later in their elementary career. Armed with a list of characteristics to watch for, a teacher or other school professional could potentially add this to the list of assessments that help determine who is at risk for a reading disability and in need of more intense intervention.

Statement of Problem

As a first grade teacher, having the ability to pinpoint behavior and/or academic warning signs that would help recognize whether a student is delayed or potentially has a learning disability, would be extremely useful and time efficient. The inability of current assessments to accurately predict reading disabilities among first graders (Compton, Fuchs, Fuchs, & Bryant, 2006) was my motivation to explore the topic of academic and behavior warning signs related to reading outcomes. Academic assessment is necessary for teachers to determine the focus of specific instruction and appropriate intervention. Assessment can only contribute to higher reading achievement when the assessment answers important questions and results in research-based instructional decision making (Coyne & Harn, 2006). The sooner intervention can begin the more effective intervention will be. I am interested in academic and behavior assessments of
early elementary students which help predict future reading outcomes. The two major areas I investigated were problem behaviors and academic signs that affect reading outcomes. Dynamic Indicators of Basic Early Literacy Skills (DIBELS) is an academic oriented instrument used to predict reading outcomes. Response to Intervention (RTI) is a method to provide appropriate intervention. Positive Behavior Interventions and Supports (PBIS) and Functional Behavior Assessments (FBA) are tools used to identify and address behaviors that affect reading outcomes. Problem behaviors and poor reading outcomes often occur simultaneously and need to be addressed as such. Documented problem behaviors that may affect reading outcomes are: poor task engagement, poor self-control, poor interpersonal skills, internalizing problem behaviors, and externalizing problem behaviors, acting out, withdrawing from classroom activities, volunteering comments, and task avoidance (Wasson, Beare, & Wasson, 1990; Hagan-Burke et al., 2011; Morgan, Farkas, Tufis, & Sperling, 2008).

**Research Question**

What behavior and/or academic characteristics in first graders (early elementary students) predict a future learning disability?

**Definition of Terms**

Response to Intervention (RTI) is a multi-tiered instructional and intervention delivery model designed to improve student learning. RTI focuses on students at risk for reading difficulties (Johnson, Jenkins, Petscher, & Catts, 2009).

Dynamic Indicators of Basic Early Literacy Skills (DIBELS) are a set of fluency measures developed for identifying students at risk for becoming successful readers (Burke, Hagan-Burke,
Kwok, & Parker, 2009). DIBELS consists of several subtests: Initial Sound Fluency (ISF), Letter Naming Fluency (LNF), Phoneme Segmentation Fluency (PSF), Nonsense Word Fluency (NWF), and Oral Reading Fluency (ORF).

Functional Behavioral Assessment (FBA) is the process of identifying the reason and the specific purpose or function of a problem behavior (Neilsen & McEvoy, 2004). It is important to identify the events in the environment that precede and follow the challenging behavior.

Positive Behavioral Interventions and Supports (PBIS) is a positive proactive approach that involves the training of expected social behaviors to all the students in the school (Bradshaw, Reinke, Brown, Bevans & Leaf, 2008).
Chapter II: Review of Literature

Introduction

First graders, usually 6 or 7 years old, are developing readers and all learning at different rates. Some students come to first grade already knowing how to read while some read very little. Their environment and background experiences all play a major role in reading development. The first five years of a child’s life have a huge impact on a child’s brain development and future academic achievement (www.factsforlifeglobal.org). As a first grade teacher, I want to do everything I can to help a child learn to read and be ready for second grade. The school year can fly by very quickly and there is so much for students to learn. There are the students that pick up skills quickly, there are the students that are a little slower to progress and there are students that may really have a reading disability which makes learning to read harder for them. Screening is necessary for determining which students need early intervention to improve their reading. Speece et al. (2011) suggested accurate screening cannot really take place until the end of first grade. My goal as a first grade teacher is to learn as much as I can about the warning signs, academic and/or behavioral, that might indicate a student is at risk for a reading disability. I want to be able to distinguish between the students who may develop a reading disability that will affect them later in elementary and students who are developmentally behind. There are children who are slow starters and with maturity will do just fine. Early intervention is the key to future academic success.

First grade is typically too early for a learning disability diagnosis. ORF seems to be negatively affected as students transition from learning to read to reading to learn (Chard et al. 2008). By then, a child can already be behind academically, maybe not liking school, and exhibiting disruptive behavior. What are the behavior and academic warning signs that
distinguish a child with a learning disability from a child who is maybe just a little behind his peers? As a teacher, I would like a checklist of academic and behavior characteristics that identify students who may be more likely to develop a reading disability. A teacher could then tally the warning signs for each student and provide intervention for students at risk for a reading disability.

**Topic A: Dynamic Indicators of Basic Early Literacy Skills (DIBELS)**

Dynamic Indicators of Basic Early Literacy Skills (DIBELS) are a set of fluency measures developed for identifying students at risk for becoming successful readers (Burke et al., 2009). There are many academic assessments to aid teachers and other school professionals in determining which children need some type of intervention. DIBELS is a commonly used assessment tool to aid in instructional decision making. DIBELS can help identify specific academic areas where a child may be lacking. Some of those specific deficit areas are more commonly seen in a child with a learning disability. DIBELS consists of several subtests: Initial Sound Fluency (ISF), Letter Naming Fluency (LNF), Phoneme Segmentation Fluency (PSF), Nonsense Word Fluency (NWF), and Oral Reading Fluency (ORF). Before intervention can be implemented, a student needs to be identified as at risk in an accurate way. DIBELS is one instrument used for identification.

Catts, Petscher, Schatschneider, Bridges, and Mendoza (2009) had 18,667 participants from Florida Reading First schools. Data were collected from students in kindergarten through third grades. The authors of this study collected data from five DIBELS assessments: ISF, LNF, PSF, NWF, and ORF in addition to a standardized measure of reading comprehension, the Stanford Achievement Test (SAT-10). The SAT-10 was administered in February of third grade. DIBELS measures were administered four times a year in kindergarten through second grade.
The distributional characteristics and predictive validity of DIBELS was measured. Catts, et al. (2009) found that Letter Naming Fluency (LNF) in kindergarten was a good predictor of Oral Reading Fluency (ORF) 2 years later. Results also showed that Nonsense Word Fluency (NWF) in early second grade was a good predictor of ORF 1.5 years later. ORF was determined to be a good predictor of reading outcome on a formal assessment administered in third grade.

Goffreda, Diperna, and Pedersen (2009) administered the DIBELS to 67 first graders from a rural school district. This study’s goal was to examine the validity of the DIBELS test in predicting proficiency on standardized exams. The DIBELS benchmark assessments were administered three times a year. The standardized tests that were administered were the TerraNova California Achievement Test (CAT) Assessment in second grade and the Pennsylvania System of School Assessment (PSSA) in third grade. Only the reading scores were examined in the standardized tests. Logistic regression analysis was used to determine the validity of the DIBELS scores in predicting reading outcomes on the standardized tests. The ORF subtest emerged as the only significant predictor of future reading success. The remaining indicators (PSF, LNF, and NWF) did not emerge as significant predictors. The ORF does incorporate all of the skills included in the PSF, LNF, and NWF indicators. The ORF subtest is an effective screening tool for later reading proficiency (Goffreda et al., 2009).

DIBELS was also used in a study evaluating the accuracy of screening instruments (Johnson et al., 2009). Participants were 12,055 students from 33 districts in Florida. Student data were collected beginning in kindergarten and continued through the end of third grade. In addition to DIBELS, The Peabody Picture Vocabulary Test (PVVT), the SAT and the Florida Comprehensive Assessment Test (FCAT) were administered. NWF was found to be the most accurate screening for kindergarteners while ORF was the most accurate screening tool for first
graders (Johnson et al., 2009). The finding that ORF is an accurate screening for first graders is consistent with the above-mentioned studies. Interesting to note is that DIBELS recommends using NWF in the fall of first grade, not ORF. The ORF is typically administered middle and end of first grade.

Also using the DIBELS, Chard et al. (2008) conducted a longitudinal study that followed 668 kindergarten and first grade students identified as at risk for reading difficulties through third grade. Students were identified as needing additional or intensive intervention in both grades. The three districts were already using multitier, evidence-based reading practices. During the course of this study, the DIBELS subtests of LNF, PSF and NWF were used to screen students in the winter of kindergarten and the fall of first grade. Two measures of ORF were administered in the fall, winter and spring of each year. The SAT-10 was administered in the spring of third grade. The Woodcock Reading Mastery Tests included a word identification subtest, a word attack subtest and a passage comprehension subtest. This measure was administered in the fall and spring of each year. The Social Skills Rating System was also administered. The authors of this study found the first grade passage comprehension subtest to be a strong predictor of group norm referenced testing results by the end of third grade. The authors of this study examined the development of reading for students in grades one through three within schools implementing school wide prevention models of instruction to determine which variables, including demographic and specific student achievement, are most predictive of later reading success. Data analysis in this study was descriptive statistics. Results suggest DIBELS does assist many students in advancing their reading skills. The authors found a number of significant predictors of Oral Reading Fluency (ORF), including fall of first grade LNF, spring of first grade alphabetic principle (AP), and spring of first grade teacher-rated academic competence. The authors found
alphabetic principle (AP) to be a strong predictor of reading success which suggests that a strong focus on AP continues to be important of ORF growth, as was found by Coyne & Harn, (2006). Findings by Chard et al. also suggest first grade comprehension is a strong predictor of SAT-10 by the end of third grade. In conclusion, Chard et al. suggest evaluating reading instruction and how these methods impact student learning is essential and can help schools improve student outcomes.

Burke et al. (2008) also used DIBELS in a study of 218 kindergarteners from a large rural school in Georgia. The purpose of this study was to examine the predictiveness of early literacy indicators from DIBELS. This study did not say how students were chosen for participants or if all kindergarteners in the school were included. Four subtests of DIBELS were administered during the middle of kindergarten: ISF, PSF, LNF, and NWF. DIBELS ORF was also administered across the three years of this study. The data collectors were trained and DIBELS administration procedures were strictly followed. Burke et al. concluded DIBELS did provide a good picture of reading acquisition and has a good predictive validity. Nonsense word fluency and the use of comprehension measures were strong aspects. For older children, oral reading fluency showed to be an accurate measure for predicting reading outcomes. For younger children, letter naming fluency and nonsense word fluency came close as accurate predictors. While comprehension is the goal, phonological and alphabetic mastery in kindergarten and first grade are critical in beginning reading and comprehension skills (Burke et al. & Coyne & Harn 2006).

Kendeou, van den Brock, White, and Lynch (2009) examined the connection between oral language skills and decoding skills and their predictive power for later reading through the assessment of 297 children at two test points, 2 years apart. Complete data were collected from
113 children in the 4 - 6 year old age group and 108 children in the 6 - 8 year old age group. Oral language skills were measured using these subtests from the Peabody Picture Vocabulary Test (PPVT): listening comprehension, television comprehension and vocabulary. Decoding skills were measured using the letter identification and word identification subtests of the Woodcock Reading Mastery Test and the onset recognition fluency (OnRF) measure from the DIBELS. Structural equation modeling was used to find the relation between decoding skills and oral language throughout the study. The results of this study find that oral language skills and decoding skills at one age did predict the oral language and decoding skills 2 years later. The two skills are interrelated and yet independently they each predicted a child’s reading comprehension in second grade. Both oral language (i.e. vocabulary and discourse comprehension) and decoding skills (i.e. phonological awareness and letter and word identification) make distinctive contributions to successful reading comprehension.

**Topic B: Response to Intervention (RTI)**

Response to Intervention (RTI) is a multi-tiered instructional and intervention delivery model designed to improve student learning. Tier one consists of all children receiving reading instruction in the regular classroom with progress monitored regularly. The second tier includes children who receiving small group instruction in addition to general classroom based on progress results. Tier three is usually associated with special education services (Compton et al, 2006). RTI focuses on students at risk for reading difficulties (Johnson et al., 2009). RTI stems from the 2004 IDEA (Individuals with Disabilities Education Act) legislation that requires students to receive research -based instruction from highly qualified personnel. Johnston (2010) describes RTI as it relates to the legislation in these two ways: as a strategy for identifying students with learning disabilities, with an emphasis on assessment and intervention and as a
strategy for prevention by focusing on the student’s response to quality research-based instruction. The process of RTI is concerned with whether a learner’s academic performance improves when provided with well-defined, research based instructional interventions (Mesmer & Mesmer, 2008-2009). Is the student even responding to intervention? That is an important question RTI attempts to answer. Children who respond to intervention quickly and considerably are less likely to acquire a disability than children who respond more slowly (Mesmer & Mesmer, 2008-2009). Are the slower responders more likely to develop a learning disability later on in their academic career?

With early, high quality, small group, code focused intervention; a child identified as at risk can be remediated (Simmons et al., 2008). RTI has the goal of moving an at risk student out of risk by the end of third grade. DIBELS can play an important part in the progress monitoring of a student at the various tiers of RTI. The purpose of the following longitudinal study was to evaluate the risk of reading difficulty in children. Simmons, et al. examined whether reading intervention would help those children attain reading proficiency. Participants in this study were selected in the fall of kindergarten from seven Pacific Northwest elementary schools. A total of 117 at risk students were identified according to specific criteria in kindergarten. By the end of third grade, 41 children with complete data remained. The children received supplemental interventions by either certified teachers or highly trained paraprofessionals throughout the duration of the study. During the four year study, seven different measures of student reading development were used. Measures included: Peabody Picture Vocabulary Test-Revised (PPVT-R), Phonemic Segmentation Fluency (PSF) DIBELS measure, Nonsense Word Fluency (NWF) DIBELS measure, Woodcock Reading Mastery Tests-Revised (WRMT-R) Word Attack subtest, (WRMT-R) Word Identification subtest, Oral Reading Fluency (ORF) DIBELS, and the
(WRMT-R) Passage Comprehension subtest. Data analysis in this study used descriptive statistics. End-of-kindergarten test results on all measures indicated the additional intervention provided changed student performance. The typical at-risk student in this study moved out of risk and remained there from kindergarten through third grade. Changes in risk status were generally sustained over time except in the ORF performance. Students moved in and out of risk according to the ORF subtest scores. ORF once again stands out as a significant skill to be mastered for a successful reading outcome.

The accuracy of determining risk for a reading disability among first graders remains relatively low (Compton, Fuchs, Fuchs, & Bryant, 2006). RTI models depend on accurate identification of those children who may develop a reading disability without tier 2 intervention (Compton et al, 2006). Compton, et al. (2006) chose to investigate the issues that affected the decision making rules for determining the need for tier 2 intervention among first graders. The authors wondered what the added predictive validity of including word identification fluency (WIF) skills to a multivariate screening battery that included rapid letter naming (RLN), phonemic awareness, and oral vocabulary skills. The participants were 252 children from 42 first grades in 16 urban and suburban, Title 1 schools. Project staff administered two tests to the students: the WIF and RLN skills tests. Based on the results from these tests, the six lowest performing students were selected and then verified by the classroom teacher. The selection process took place in late September and early October. These participants were then followed longitudinally from early first grade through the end of second grade. The prediction battery was administered in October and consisted of testing on phonemic awareness, rapid naming, oral vocabulary and WIF. This was followed by short term progress monitoring. The second grade outcome assessment consisted of standardized reading measures including word identification
and word attack, sight word reading and decoding, and reading comprehension. Data were analyzed using the logistic regression and classification tree analysis. The results of this study suggest that adding WIF to the first grade prediction battery in addition to phonemic awareness, rapid naming and oral language did not greatly improve the diagnostic accuracy of the prediction model. Compton, et al. did find that combining the results of the WIF and 5 weeks of progress monitoring with the base prediction battery did significantly improve the accuracy of the prediction model. The researchers do suggest there is still much work to be done in the area of early identification and prediction.

Speece et al. (2011) also found WIF to be an accurate predictor of fluency, suggesting that word identification should be an important part of a screening battery. The purpose of the following study was to develop an accurate universal screening battery that would be effectively used within an RTI framework for identifying at risk first graders. Speece et al. focused on accuracy, fluency, teacher ratings and growth as types of measurement used for predicting reading status, to find the best set of predictors. The participants were 243 first grade students from 11 schools and 16 classrooms. Assessments on sub lexical, word-level and language skills were collected four times through the school year. Data were collected at three times during the fall and winter. The fourth (spring) collection of data was used to define criterion for at risk status. What sets this study apart from several others is the focus on teacher ratings of children’s skills and behaviors. The teacher ratings of reading, academic competence, social skills, and problem behaviors were collected after Nov. 1, which allowed teachers to become more familiar with their students. The sub lexical skills measurements used were: letter sound fluency (LSF), phonemic segmentation fluency (PSF), graph phonemic fluency (GPF), and Comprehensive Test of Phonological Processing (CTOPP). The word-level skills measurements used were: Test of
Word Reading Efficiency (TOWRE), Woodcock Reading Mastery Test (WRMT), word identification fluency (WIF), passage reading fluency (PRF), Comprehensive Reading Assessment Battery (CRAB) and spelling fluency (SF). Language skills were measured using the CTOPP and the Woodcock-Johnson Psychoeducational Battery. Teachers completed The Social Skills Rating System and the Reading Rating Form. An exploratory principal axis factor analysis was used to increase reliability and reduce variables. Results of this study show WIF to be the best accuracy predictor and the TOWRE sight word efficiency and WIF to be the best fluency predictors. The WIF results are consistent with the results reported by Compton et al. (2006) who suggested that the WIF is a strong predictor when combined with intervention over time. When looking at the teacher rating results, Speece et al. found the teacher ratings of overall reading and reading problems were important. Including teacher ratings in a screening battery would be beneficial to the identification process. The authors of this study suggest that a quick screen containing word-reading fluency measures that include teacher ratings would sufficiently identify at risk children at the end of first grade.

**Topic C: Positive Behavioral Intervention Supports (PBIS)**

Research has demonstrated a link between behavior and academic success, but typically past school-wide methods of dealing with both areas have been independent of one another (McIntosh, Chard, Boland, & Horner, 2006). One research based behavioral intervention method is Positive Behavioral Intervention Supports (PBIS). Basically PBIS works like RTI with three tiers of intervention, except it focuses on behavior and how school and classroom behavior affects reading outcomes. PBIS provides a systematic training of expected social behaviors to the whole school. Through training of the entire school staff, (i.e. recess aides, bus drivers, cafeteria personnel) school-wide positive behavior support aims to redesign the environments rather than
the students. This topic is very timely for me since my school is just starting a school-wide movement where PBIS is the basis. Many schools are feeling pressure to adopt preventive interventions to address disruptive and violent behavior (Bradshaw et al., 2008). My school’s program is called School-wide Movement to Achieve RTI (SMART-I). I am on the committee being trained in the initial phase. This next school year we will implement the behavior aspect and the following year we will move into the reading phase.

McIntosh et al. (2006) sought to provide descriptive data about reading and behavior patterns of students when a 3 tiered prevention model was used for both reading and behavior support. Six elementary schools from the same district were chosen. Participants in the study were 1,653 K-Grade 3 students. The study identified the current third grade as a representative sample of the district population. Office discipline referrals (ODRs) and DIBELS were the two measures used for screening and indication of needed level of support. ODRs are currently the most useful large-scale indicators of problem behavior in school (McIntosh et al., 2006). School-Wide Information System (SWIS), a web based ODR data system is used by many schools. DIBELS is also a popular research based school-wide screening tool used in the identification of deficits in early reading skills in each grade. Schools used ODRs and DIBELS to divide students into three levels of support for behavior and reading, respectively. The results showed that the number of students who missed the DIBELS benchmark in reading in kindergarten decreased considerably by third grade. Contrasting that, the number of ODRs increased as students moved from Kindergarten to third grade. Results for this district showed that 90% of the students who entered school without reading skills became proficient readers by the end of third grade. On the behavior side, the percentage of students receiving 0-1 ODRs in third grade was 92%, with 6.5% of students receiving 2-5 ODRS and 1.5% receiving 6 or more ODRs. These results do provide
support for the idea of implementing school-wide behavior and academic support system to deal with behavioral and academic challenges. The authors of this study feel that combining the efforts of behavior and reading challenges works as well or better than expected. This study was limited in that only one school district was studied. Also, only K-3 students were included and that group is likely to have fewer behavior issues than older students. It would be interesting to see how these patterns change in fourth grade students and beyond. McIntosh et al. (2006) concluded that a combined approach to both academics and behavior using a three-tiered model does increase success in both areas. The authors believe that students who behave appropriately by end of third grade will also become proficient readers. They also believe that the reverse is true. The results of this study show that behavior and reading outcomes are closely linked. Improving reading outcomes can help improve behavior and improving behavior can help improve reading outcomes.

PBIS is a proactive approach, attempting to provide training of expected social behaviors as opposed to only addressing behavior problems after they have occurred. Bradshaw et al. (2008) examined the implementation of school-wide PBIS by gathering data from 37 elementary schools that volunteered to participate. Of these, 37 schools, 21 received training in PBIS and 16 did not receive any training during this three year study. The focus of this study was the impact of training in PBIS. The schools were randomly assigned to either the intervention or the control condition. The School-Wide Evaluation Tool (SET) was used to assess PBIS features in place at the schools. The PBIS features evaluated by the SET were: (1) overall SET, (2) define expectations, (3) teach expectations, (4) reward system, (5) respond to behavioral violations, (6) monitoring and evaluation, (7) management, and (8) district support. Observations were made and brief interviews were conducted with school personnel, administrators, and students. The
SET was administered on a single day in the month of May each year of the study. 15 people were hired by the project and trained to assess PBIS with the SET. These trained people were kept unaware of the schools’ intervention status during the whole study. Schools in both the trained and untrained groups showed some aspects of PBIS at baseline. I feel that is because PBIS is rooted in basic and commonly understood behavioral, social learning, and organizational principles. This is perhaps why PBIS is popular right now; it just makes sense. The results of this study show a significant intervention effect. The trained schools outperformed the untrained schools in all of the above mentioned features except in responding to behavioral expectations. The schools were all pretty similar in their systems for responding to violations at baseline. They differed in the ways they defined behavioral expectations and they ways they taught behavioral expectations. This rings true with what I predict will happen at my school. I don’t think the way my school will respond to behavior violations is going to change. What we hope to change is the frequency and severity of those violations by defining and teaching behavioral expectations to all students. Ultimately we are looking to see a positive effect on reading outcomes. When digging deeper into the scores of the subscales on the SET, the authors of this study suggest that schools could spend less training time on the areas of responding to behavioral violations and monitoring and evaluation. The area of teaching behavioral expectations showed the least growth. This suggests the need to spend more time on developing lesson plans, teaching expectations and reviewing the lessons. I can see the area of teaching the expectations to be the hardest to manage because teachers already have so much to teach. On the other hand, with improved behavior resulting from PBIS there will be less time spent on discipline and more time to spend on academics.
Topic D: Functional Behavioral Assessments (FBA)

The use Functional Behavioral Assessment (FBA), while not a new idea, is increasingly needed as the number of behaviorally diverse students increases in schools. More students with developmental disabilities are being mainstreamed and included in general education. A FBA can be used to identify the antecedents and consequences associated with the occurrence of problem behaviors. An experimental functional analysis (EFA) is a type of FBA that uses basically the same methodology, but there is more experimental manipulation of the environment. An EFA is more often used with typically developing children who are displaying problem behaviors as opposed to children identified with a disability.

Shumate & Wills (2010) conducted a functional analysis of disruptive and off-task behavior of three second grade students in a reading classroom. This study’s components consisted of a baseline, EFA conditions, and intervention sessions all occurring in the reading room during a normal instructional period. This qualitative study had three participants of average intelligence who were identified as at-risk for reading failure based on scores on the DIBELS. The students were in a regular classroom, receiving no additional intervention support. The 3 students, two males and one female, were also identified by the teacher as engaging in high rates of disruptive and off-task behavior. Some examples of disruptive behavior included the student arguing, taunting, audible vocalizations (i.e. singing and humming), making repeated audible noises with tangible items (i.e. pencil tapping), calling out the teacher’s name, getting out of their seats. Off-task behavior was characterized by not attending to or participating in requested instructional activities (i.e. gazing around the room and not following directions). Data were also collected on teacher behavior (i.e. attention to students and demands to students). Some example of teacher attention included praise, answering questions, correcting, high fives,
eye contact or thumbs up). Teacher demands were defined as a request to engage in an academic activity. Data were collected using a momentary time sampling procedure. The results of the functional analyses for all 3 students showed teacher attention maintained disruptive and off-task behaviors. A function based intervention was then implemented to target the teacher attention variable. This intervention consisted of differential reinforcement of other behaviors (DRO) with extinction and differential reinforcement of alternative behaviors (DRA). This function based intervention was successful in decreasing the rates of off-task and disruptive behaviors in the participants.

Filter & Horner’s (2009) study on function-based academic interventions also found function based interventions to be more effective than non-function-based interventions in reducing problem behavior. The participants in this study were two fourth grade male students. The students were nominated for this study by their teachers because of high incidence of problem behaviors. The first participant was identified as having a learning disability (LD) and most of his problem behaviors occurred during reading tasks. The second participant had no identified learning disability and performed at grade level in all academic areas. During the study the second participant started taking medication for attention-deficit/hyperactivity disorder which did not decrease his problem behavior. All of the intervention and most of the assessment occurred in the participants’ general education classroom. Any procedures were implemented by the experimenters so as not to interrupt the classroom teacher’s duties. Data were collected on problem behavior and task engagement. These were measured using an interval-based direct observation procedure. The participants were asked to complete a five-minute intervention acceptability interview. The teacher also completed a functional assessment checklist. The results from this study revealed the first student (identified as LD) presented problem behaviors
in order to escape from difficult reading tasks. The second student (no LD diagnosis) presented
task avoidance behaviors as a way to seeking help in order to avoid failure. The results of this
study clearly show the benefit of providing function-based assessments to students without
severe disabilities. The second part of the study focused on function-based interventions and
concluded that function-based interventions were more successful in reducing problem behavior
than non-function-based interventions. This finding is in agreement with the findings of Shumate

**Topic E: Behavior**

Behavior may also be a predictor of a learning disability in conjunction with academic
problems. Are there are certain behavioral characteristics that are more common in students with
reading difficulties? Do reading problems lead to behavior problems and do behavior problems
lead to poor reading outcomes? The following reviews provide some clues as to which problems
behaviors are observed more often in students experiencing negative reading outcomes.

Wasson et al. 1990 investigated the behavioral characteristics of good readers and poor
readers in a classroom setting. Participants were chosen from grades 1, 3, 5, 7, 9, and 11. A total
of 9 good readers and 9 poor readers were chosen from each of the grade levels based on scores
from the latest standardized reading achievement tests. This selection process resulted in 108
students from 18 classrooms, half identified as good readers and half identified as poor readers.
Specific behaviors were chosen based on review of literature about classroom behavior,
discussions with teachers and observation of student behavior. The seven behaviors and
definitions chosen were: (1) seconds to start - number of seconds from beginning of activity until
student is on task, (2) materials missing - based on list of necessary materials from teacher, (3)
noise - sounds created by student that distracts others, (4) out of place - movement beyond
allowed boundaries, (5) physical contact or destruction - any unacceptable contact, (6) off task -
looking around, doodling, (7) volunteering - deliberately volunteering to answer with or without
permission. Data were gathered by observing the 6 students in each classroom for 30 minutes a
day for 10 days. The observers were not told which students were poor readers, but only which 6
students to observe. Data were analyzed using a two-way analysis of variance procedure. The
results of this study indicate that no differences were found between good readers and poor
readers in the following areas: (1) seconds to start, (2) materials missing, (3) noise, (4) out of
place, and (5) physical contact. They did find that poor readers were off-task more and
volunteered less often than good readers. The results from this study show that poor readers did
not exhibit behaviors that disrupted learning any more than good readers. This research did
suggest that poor readers are less engaged and less involved in learning than good readers. There
is a difference in the active participation in learning between good and poor readers.

Morgan et al. (2008) investigated whether reading and behavior problems were risk
factors for each other. This study had two purposes. First, the authors tested whether children’s
reading problems would predict later behavior problems. Morgan et al. identified problem
behaviors as: poor task engagement, poor self-control, poor interpersonal skills, internalizing
problem behaviors, and externalizing problem behaviors. Second, they investigated whether
early manifestations of behavior problems would predict later reading failure. The database for
this study was the Early Childhood Longitudinal Study - Kindergarten Class (ECLS-K). The
study’s sample included 11,515 students attending 1,471 public and private elementary schools.
The instrument used for this large scale study was The Reading Test, which was created through
a multistage panel review. This assessment was administered to the children to assess basic
skills, vocabulary and comprehension. The Teacher Social Rating Scale was completed by the
teachers to measure children’s behavior. Additionally, the authors of this study investigated family resources, demographic differences, and whether the children already displayed either poor reading ability or any abnormal specific behaviors. Data were collected at the beginning and end of kindergarten, fall and spring of first grade and again in the spring of third grade. The teachers completed the social rating scale each time the children were assessed. Using a multilevel logistic regression model, the authors of this study sought to determine whether reading and behavior problems were risk factors for each other. The results show evidence that being a poor reader in first grade does increase a child’s likelihood of displaying poor task engagement, displaying poor self control, developing externalizing behavior problems and displaying internalizing behavior problems in the spring of third grade. Being a poor reader in first grade does not increase the likelihood that a child will display poor interpersonal skills in the third grade. The results for the second question of whether behavior problems are a risk factor for reading problems revealed just one statistically significant predictor. The chances of a being a poor reader at the end of third grade was higher if a child displayed low levels of task-focused behaviors in the beginning of first grade. The authors of this study interpreted this to mean reading problems did increase a child’s chances of displaying problem behaviors. They also concluded the problem behavior of poor task engagement was a predictor of later reading problems. This finding concurs with Wassen et al. (1990) as poor task engagement relates closely to off-task behavior. The results of this study point to recommending the most likely effective interventions are those that target both reading and behavior problems together (McIntosh et al., 2006: Morgan et al., 2008). This particular study is significant to my research question because it shows that reading outcomes and behavior are connected to one another.
Hagan-Burke et al. (2011) took the questions from the Morgan et al. (2008) study a bit further and examined the influence of different types of behavior problems on reading outcomes and attempted to determine the extent to which reading instruction would address those behavior problems. Participants in this study were 206 kindergarteners considered at greatest risk for reading problems. Students were selected based on reading risk with no regard to problem behavior. The kindergarten classes were randomly assigned to either an intensive reading intervention program using explicit, systematic, code-based instruction (ESC) or a school-determined intervention (SDI). The ESC used for this study was the Early Reading Intervention, a commercial program designed to target phonemic and alphabetic skills in kindergarteners. The SDI was a reading intervention selected by the teachers and schools. The students’ reading and reading-related outcomes were measured using a variety of assessments including; DIBELS, Comprehensive Test of Phonological Processing (CTOPP), and Woodcock Reading Mastery Tests. The assessments measured LNF, phonemic awareness, alphabet knowledge, word attack and word identification. Even though problem behavior was not used in the participant selection process, classroom teachers were given the Social Skills Rating System for Teachers (SSRS-T). This questionnaire is designed to assess social behavior in school. Three subscales of this test measure externalizing, internalizing and hyperactivity. In addition to the above mentioned measures, observation was used frequently to collect data. Hierarchical linear modeling was used as the data analyses for this study. When the teacher ratings of problem behavior were analyzed, there was no significant difference between the ESC group and the SDI group. Next, the correlations between behavior and reading outcomes were analyzed. Hagan-Burke et al. (2011) found that children with more behavior problems tended to score lower on end of kindergarten reading assessments. The researchers found that students with higher ratings of all three problem
behaviors listed above scored lower on the assessment of reading and reading-related skills, such as phonemic awareness, alphabet knowledge and word reading outcomes at the end of kindergarten. The authors of this study feel presence of problem behaviors may negatively impact a child’s ability to profit from reading instruction.

Chapter III: Results and Analysis Relative to the Problem

Topic A: Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Results

DIBELS is commonly used for assessment and identification of specific academic areas where a child may be lacking. Which of those specific deficit areas are more commonly seen in a child with a learning disability? There is copious literature detailing the use of DIBELS as a screening tool. This review highlights the DIBELS subtests that have the most predictive value. Oral reading fluency (ORF) emerged as a strong predictor of reading outcomes for late first grade and beyond (Burke et al., 2009; Catts et al., 2009; Chard et al., 2008; Goffreda et al., 2009; Johnson et al., 2009). LNF was found to be an accurate predictor in kindergarten students (Catts et al., 2009; Chard et al., 2008). AP was found to be a predictor in younger students (Burke et al., 2009; Chard et al., 2008). Finally, NWF was also found to be a strong predictor (Burke et al., 2009; Catts et al., 2009). When looking at the above conclusions, one may think that all of the DIBELS subtests are good predictors at one stage or the other. Remember that ORF is more accurately assessed after earlier skills are mastered. Interventions with young children may not necessarily target ORF, but they do target the skills that predict ORF success such as AP, ISF, LNF, NWF, and PSF. Younger children need to be assessed using the earlier skills subtest and
ORF may be more useful later. Speece et al. (2011) suggested that accurate screening does not really take place until the end of first grade. DIBELS is a useful screening tool for first grade through later elementary.

**Topic B: Response to Intervention (RTI) Results**

Quality-based instruction is vital to successful reading outcomes. RTI attempts to address the needs of those students that are not benefiting from instruction. Various screening measures are utilized to identify students who are not responding to intervention and need further intervention. RTI closely monitors those students and whether they are responding to the researched based intervention. The goal of RTI is to move an at risk student out of risk by the end of third grade (Simmons et al, 2008). Early, high quality, small group, code focused intervention (Simmons et al., 2008) is necessary to reduce reading risk in children. RTI attempts just that.

**Topic C: Positive Behavioral Intervention Supports (PBIS) Results**

Behavior and reading outcomes are closely linked and research is increasingly showing the importance of intervention that addresses both areas simultaneously. PBIS is a proactive behavior and reading intervention program that aims to address school wide behavior with the goal of improving reading outcomes (McIntosh et al. 2006). McIntosh et al. found improving reading outcomes can help improve behavior and improving behavior can help improve reading outcomes. Even though PBIS is rooted in basic and commonly understood behavioral, social learning, and organizational principles, trained schools outperformed untrained schools in positively affecting behavior and reading outcomes (Bradshaw et al. 2008).
**Topic D: Functional Behavioral Assessments (FBA) Results**

More students with developmental disabilities are being mainstreamed and included in general education. This in turn increases the number of behaviorally diverse students in schools (Shumate & Wills, 2010). A FBA can be used to determine the antecedents and consequences of a problem behavior so a function based intervention can be applied. Function-based interventions are more successful in reducing problem behaviors than non-function-based interventions (Filter & Horner, 2009; Shumate & Wills, 2010).

**Topic E: Behavior Results**

All of the behavior related studies reviewed concluded that problem behaviors and reading outcomes are related (Hagan-Burke et al. 2011; Morgan et al. 2008; Wasson et al. 1990). Off task behavior and/or poor task engagement stood out as a strong predictor of future reading problems (Morgan et al. 2008; Wasson et al. 1990). Since problem behaviors affect reading outcomes and poor reading can affect behavior, it does make sense that interventions should target both behavior and reading to be most effective. Poor readers tend to be less involved in learning and volunteer less often in class (Wasson, et al. 1990). Whether or not the student is actively participating in learning is an important question.

**Analysis**

Researchers have identified several academic and behavior warning signs present in first graders or early elementary students that may predict a future reading disability. The DIBELS ORF subtest was commonly identified as a successful predictor of future reading outcomes in first graders (Catts et al., 2009; Goffreda et al., 2009; Johnson et al., 2009). In contrast, Chard et al. (2008) identified the first grade passage comprehension as a strong predictor and indicated the ORF was better used with older children. LNF and NWF were identified as strong predictors in
kindergarten (Catts et al., 2009; Chard et al., 2008; Johnson et al., 2009). The problem for first grade teachers is that the ORF is typically not administered until winter of first grade. By the middle or end of first grade, significant early intervention time has already been missed. The success of ORF is consistent with Catts et al. (2009), but the limited effectiveness for LNF and NWF as predictors found by Goffreda et al. (2009) is not consistent with Catts et al. (2009), Chard et al. (2008), and Johnson et al. (2009). It is important to assess and identify at risk students. The goal of RTI is to move an at risk student out of risk by the end of third grade. Third grade is a significant year because by the end of third grade is when we see the transition from “learn to read” to “read to learn” (Chard et al., 2008). It is at this critical point that ORF scores can begin to decrease, as the reading passages become more difficult. This makes the early, high quality, small group, code focused intervention even more critical. While RTI is a three tiered model for addressing reading outcomes, PBIS is a three tiered proactive model addressing behavior and reading outcomes. McIntosh et al. (2006), maintain that behavior and reading outcomes are closely linked. PBIS is a way to tackle both of these issues simultaneously. Even though PBIS is based on commonly understood behavioral, social learning, and organizational principles, Bradshaw et al. (2008) concluded in their study that trained schools did show a significant intervention effect. Training is necessary for intervention to be effective.

Problem behaviors and poor reading outcomes often occur together. Wasson et al. (1990) found poor readers were off task more and volunteered less often than good readers. This is comparable with Morgan et al. (2008), who concluded that being a poor reader in first grade does increase the likelihood of displaying poor task engagement by the end of third grade. Morgan et al. (2008), also suggest that effective interventions are those that target both reading and behavior problems. One such intervention is PBIS.
Problem behaviors must first be identified before they can be effectively addressed. FBA is a common tool for identifying the antecedents of problem behaviors. A function based analysis of a behavior can lead to a successful function based intervention as shown by Shumate and Wills (2010) in their study about disruptive and off task behaviors. Filter and Horner (2009) also concluded that function based interventions were more effective than non-function based interventions in reducing problem behaviors. It is important for problem behaviors to be addressed, because as Burke et al. (2011) suggest, the presence of problem behaviors may negatively impact a child’s ability to profit from reading instruction.

Chapter IV: Recommendations and Conclusions

Recommendation

This literature review resulted in the identification of many academic and behavior predictors of reading outcome. One of the academic warning signs that most effectively predicted a reading disability was ORF. ORF scores should be closely monitored at the end of first grade and beginning of second grade. Early and middle first grade is often too early for the ORF subtest. Therefore, first grade teachers need some other way to predict reading outcomes so intervention can begin earlier. In addition to academic warning signs, several problem behaviors were associated with poor readers. Based on the above literature review, I created table 1 as a checklist for first grade teachers and other early elementary teachers. This checklist does not necessarily reveal any new academic or behavior characteristics, but helped to organize them is a useful way. The academic and behavior checklist combines the academic and behavior characteristics that are most commonly observed in poor readers all on one page. This checklist would also be useful in the child study process which is part of RTI.
### Table 1. Informal Checklist of Academic and Behavior Characteristics

<table>
<thead>
<tr>
<th>Name of student</th>
<th>Teacher</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Birth date</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Academic Characteristic

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Check if below expectation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does not like to read</td>
<td></td>
</tr>
<tr>
<td>Oral Reading Fluency (ORF)</td>
<td></td>
</tr>
<tr>
<td>Letter Naming Fluency (LNF) kindergarten</td>
<td></td>
</tr>
<tr>
<td>Nonsense Word Fluency (NWF) early second grade</td>
<td></td>
</tr>
<tr>
<td>Word Identification Fluency (WIF)</td>
<td></td>
</tr>
<tr>
<td>Rapid Letter Naming (RLN)</td>
<td></td>
</tr>
<tr>
<td>Alphabetic principal (AP)</td>
<td></td>
</tr>
<tr>
<td>Phonological awareness</td>
<td></td>
</tr>
<tr>
<td>Letter knowledge/print awareness</td>
<td></td>
</tr>
<tr>
<td>Is student responding to academic interventions?</td>
<td></td>
</tr>
<tr>
<td>Other -</td>
<td></td>
</tr>
<tr>
<td>Other -</td>
<td></td>
</tr>
<tr>
<td>Other -</td>
<td></td>
</tr>
</tbody>
</table>

#### Behavior Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Check if present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calls out to teacher across the room</td>
<td></td>
</tr>
<tr>
<td>Out of seat behavior</td>
<td></td>
</tr>
<tr>
<td>Off task – engaged in disruptive behaviors while not engaged in the activities instructed by the teacher</td>
<td></td>
</tr>
<tr>
<td>Does not like school</td>
<td></td>
</tr>
<tr>
<td>Does not want to go to school</td>
<td></td>
</tr>
<tr>
<td>Disruptive behaviors – such as: arguing, taunting, name calling, talking to peers, audible vocalizations unrelated to the instructional task (including singing and humming) repeated audible noises with tangible items (for example pencil tapping)</td>
<td></td>
</tr>
<tr>
<td>Task engagement / involved in learning - poor</td>
<td></td>
</tr>
<tr>
<td>Attention to task - poor</td>
<td></td>
</tr>
<tr>
<td>Does not volunteer in class</td>
<td></td>
</tr>
<tr>
<td>Is student responding to behavior interventions?</td>
<td></td>
</tr>
<tr>
<td>Other -</td>
<td></td>
</tr>
<tr>
<td>Other -</td>
<td></td>
</tr>
</tbody>
</table>

Teacher Notes:
Areas for Further Research

As mentioned above, DIBELS ORF is a significant predictor of future reading outcomes when used in late first grade, early second grade and beyond. Further research is needed to identity significant predictors for early first grade. While LNF, NWF, and PSF are regularly used subtests in early elementary, the reviewed literature suggests they are not as effective predictors of reading outcomes for first graders as ORF. As a first grade teacher, I do not want to wait for the ORF scores later in first grade. This paper also identified several problem behaviors that could warn of a future reading problem. The above checklist should be used in conjunction with other research based measures. Administered early in first grade, this checklist could guide instruction and intervention earlier in the year. The advantage to this checklist is behavior and academic warning signs are combined on one form. The following study would attempt to answer the question: How effective is my checklist in predicting a future learning disability?

I propose a longitudinal study using the academic and behavior predictors’ checklist to identify academic and behavior warning signs in students from kindergarten and first grade and follow them through 4th grade. Participants would be 200-300 kindergarteners from 10+ classrooms in 3 or more rural schools. Data would be collected using the checklist, in addition to commonly used measurements such as DIBELS, at the beginning of kindergarten and again at the beginning of first grade. The classroom teacher would complete the checklist in October of each year after they have had time to get to know the children. The students would be revisited at the beginning of 4th grade to determine which of the original students were identified as having a reading disability. Multivariable statistics analysis would be used to determine which characteristics or subset of characteristics in the check list most often were observed in students with a reading disability. The results from the checklist multivariable analysis would be
compared with results of DIBELS subtests to determine the most effective method to predicate a reading disability in early first grade.

**Conclusions**

If one can predict a reading disability, one might be able to prevent the reading disability with early and intensive intervention. The success of predicting a risk for a reading disability in early first grade remains low (Compton et al., 2006). ORF was generally a good predictor of reading disabilities (Burke et al., 2009; Catts et al., 2009; Chard et al., 2008; Goffreda et al., 2009; Johnson et al., 2009) when given winter or spring of first grade. Academic reading assessments typically are not considered reliable until the end of first grade (Speece et al., 2011). Accurate assessment and progress monitoring facilitate effective intervention. RTI addresses academic intervention by focusing on early, high quality, small group, code focused intervention (Simmons et al., 2008). Schools are experiencing an increase in social behavior issues and recent legislation demands that behavior be addressed (Bradshaw et al., 2008). FBA’s are used to identify behaviors and their functions. A functional intervention can then be developed to reduce the frequency of a problem behavior (Filter & Horner, 2009; Shumate & Wills, 2010) which is important because behavior and reading outcomes are often linked (Hagan-Burke et al., 2011; McIntosh et al., 2006; Morgan et al., 2008; Wasson et al., 1990). PBIS is emerging as a successful, proactive approach to teaching appropriate social behaviors to all children in a school which leads to better behavior and more instructional time resulting in better reading outcomes (Bradshaw et al., 2008). Academic warning signs and problem behaviors commonly associated with students with reading disabilities were identified and collected into a checklist that could be given to students early in the first grade. Speece et al. (2011) noted the importance of including teacher ratings in making decisions about interventions. This checklist combines the results from
academic assessments and teacher ratings into one form. Through early identification and targeted intervention some reading disabilities may be prevented providing more children to be successful lifelong learners.
References


