

Concurrent Validity of the Group Reading Assessment and Diagnostic Evaluation and
Dynamic Indicators of Basic Early Literacy Skills

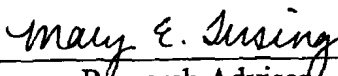
by

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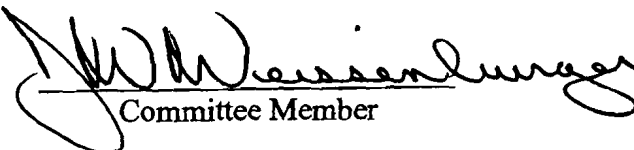
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ABSTRACT

Many school age children struggle as they learn to read. Early deficits in reading skills have been linked to both academic and social problems. Recent legislation (No Child Left Behind, n.d. ; Kovalesski & Prasse, n.d.) has driven the need to find appropriate assessment tools in order to identify students needing early reading intervention. Two such measures, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) and the Group Reading Assessment and Diagnostic Evaluation (GRADE), are reviewed in the current study. Concurrent validity between the two measures was examined. Results indicated moderate to high correlations between the Phonological Awareness Composite of the GRADE with the DIBELS measures of Initial Sound Fluency and Letter Naming Fluency. Remaining clusters from the GRADE assessment did not demonstrate adequate correlations with the two DIBELS measures. In addition, the DIBELS and GRADE were evaluated for their effectiveness as a screening tool as identified by Gredler (1992). The

assessments consistently identified 80% of the students. The results of this study indicated 26.4% of the students were identified by both measures as being at-risk for reading difficulties, while 53.8% were considered not at-risk. Findings are discussed with regard to implications for practice and future research.

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Chapter I: Introduction

Reading skills are necessary for academic success at every level and in every subject in school. In addition to poor school performance, poor reading achievement is correlated with social problems, teen pregnancies, delinquency, unemployment, and homelessness (Kaminski & Good, 1996). The need for early intervention with struggling readers is reinforced by findings that children who are behind in reading development at the end of first grade remain behind their peers in fourth grade (Juel, 1988) and even through high school (Cunningham & Stanovich, 1997). Currently, 10%-30% of children in school have trouble in reading (Kaminski & Good, 1996). Given the grave implications of poor reading ability for both children and the country at large, legislators have recently implemented general education law and special education law to help ensure the success of all students.

Legislation known as the No Child Left Behind Act, was signed by President George W. Bush in January of 2002, (No Child Left Behind, n.d.). The law has four major premises: to increase the accountability of schools, to provide more choices for families to ensure children's needs are being met, to provide more flexibility for states and school districts to determine the use of funding, and finally to put reading first. It is the goal of President George W. Bush to ensure that every child reads by third grade. This goal has had considerable implications for reading instruction and state assessments in reading. As a result, many schools have needed to rethink practices in educating and providing academic support to their youngest learners.

More recently, changing special education law now emphasizes the importance of identifying and intervening with children at risk for learning disabilities earlier in the

educational process (Kovaleski & Prasse, n.d.). In 2004, following much special committee discussion, Congress reauthorized the Individuals with Disabilities Education Act of 2004 (IDEA). A major area of revision occurred in the definition of how schools are to identify children with learning disabilities. Specifically, IDEA identifies the importance to evaluating a child's Resistance to Intervention (RTI; Kovaleski & Prasse, n.d.). A key component to RTI is the early identification of students who are struggling academically. Schools are most often turning to curriculum-based measurements in order to identify children in need of increased intervention and to evaluate a student's response to various interventions.

Curriculum-based measures are used to determine a student's skill level on a critical measure of academic performance. Critical areas of reading development identified by researchers with the University of Oregon are often referred to as the Big Ideas in Beginning Reading (Big Ideas in Beginning Reading, 2003). These important variables in reading, described as the five "big ideas," are: phonemic awareness, print awareness, fluency and accuracy with connected text, oral language development, and comprehension (Big Ideas in Beginning Reading, 2003). It is argued that assessment tools used to identify children at risk for reading difficulties should reflect these areas of development. Two assessments specifically developed to identify young students at risk for reading problems and to monitor their response to intervention are the Dynamic Indicators of Basic Early Literacy Skills (DIBELS: Good & Kaminski, 2002) and the Group Reading Assessment and Diagnostic Evaluation (GRADE: Williams, 2001).

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002) were conceptualized to be a downward extension of already researched

curriculum-based measurements (CBM) in reading (Elliot, Lee, & Tollefson, 2001). In general, curriculum-based measurements are used to assess a student's academic skills and progress over time. One of the most effective CBM's for readers is oral reading fluency, which provides a measure of the number of words a child is able to read from grade level reading materials (Shinn & Bamonto, 1998; Fuchs & Fuchs, 2002).

Unfortunately, oral reading fluency measures are not helpful with children who are not yet reading. As a result, Kaminski & Good (1996) worked to develop several additional fluency measures to precede or be used with oral reading fluency when assessing the reading skills of children in preschool through third grade (Shinn & Bamonto, 1998). DIBELS assessments were designed to reflect the big ideas of phonological awareness, alphabetic principle and fluency with text (Good & Kaminski, 2002).

Currently, the DIBELS benchmarks and monitoring assessments are being employed by teachers and school psychologists for early identification and then progress monitoring children who are at risk for problems in reading (Kaminski & Good, 1996) in the youngest grades. Research conducted by Kaminski and Good (1996) found that DIBELS measures for Kindergarteners, specifically letter naming fluency and phonemic segmentation, were highly reliable. In addition, the reliability of DIBELS in measuring early literacy skills was higher with Kindergarten students than with first graders.

While some schools use DIBELS or other site specific curriculum-based assessments to identify children in need of additional reading intervention, other schools use standardized, group administered norm-referenced evaluations for the same purposes. Several schools located in west central Wisconsin have started using the Group Reading Assessment and Diagnostic Evaluation (GRADE) to determine a student's reading level

and the need for interventions. Developers of the GRADE identify its primary purpose as being a diagnostic tool used to determine what skills a student has mastered and what skills need to be developed (AGS Publishing, 2005). In addition, the GRADE assessment includes a growth scale value that can be used to chart progress from year to year (Fugate & Waterman, 2002). The test authors and publishers provided a research synopsis of the rationale that led to the inclusion of the composites on the GRADE. At the earliest level (Level P), the Phonological Awareness Composite was created out of research done by the National Reading Panel. Less information is provided with regard to the rationale for inclusion of the Visual Skills and Concepts Composites, however.

Purpose of the Study

This study was designed as a form of action research within the author's school district of employment. Specifically, the study provides a preliminary investigation of the usefulness of both the DIBELS and GRADE in identifying Kindergarten children at risk for reading difficulties. The concurrent validity of DIBELS and GRADE as measures of students' development of early literacy skills was a primary focus. In addition, these assessments were reviewed for their effectiveness as a screening tool. Gredler (1992) explains that the purpose of a screening tool is to determine whether or not a student might be at-risk of academic difficulties. To provide a background for the study, existing literature on early literacy development is examined, including the importance of the early identification of skill deficits. The use of standardized norm-referenced reading tests versus curriculum-based measures to identify students at risk for reading problems is discussed.

Research Questions

Based on the preceding discussion, the following research questions are proposed.

1. What is the relationship between the composite scores of the GRADE and the DIBELS measures of Initial Sound Fluency and Letter Naming Fluency?
2. Do these assessments identify the same students as being at-risk for reading difficulties?

Definition of Terms

For clarity of understanding, the following terms are defined.

Literacy - For the purpose of this study, literacy refers to the reading skills needed to function effectively in today's literate society.

Phoneme - A phoneme is the smallest unit of sound in a word.

Phonemic Awareness – An awareness of individual phonemes and the ability to hear the units of sounds and to manipulate those sounds (Goswami, 2002).

Phonological Awareness - Considered to be a global term that includes the ability to identify units of sound, but also includes the earlier stages - such as rhyme and syllable awareness (Hempenstall, 2006).

Print Awareness – The knowledge of the letters of the alphabet and decoding of letters into sounds (Whitehurst & Lonigan, 2002).

Concepts of Print – Involves aspects of print awareness, but also includes the understanding that reading progresses left to right, how pages of a book are turned, where a title is on a book, etc. (SIL International, n.d.).

Chapter II: Literature Review

Chapter one discussed the importance of early intervention for students struggling to read, and highlighted recent legislation requiring early identification, intervention planning, and progress monitoring of school age children struggling academically. The current chapter discusses the processes, or stages, involved in learning to read. The relationship between these stages and assessments used in the identification of children at risk for reading difficulties will be addressed. Two forms of assessment are compared: standardized and curriculum-based. Specific assessments, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002) and the Group Reading Assessment and Diagnostic Evaluation (GRADE; Williams, 2001) will be reviewed. Finally, there will be a critical analysis of the current research comparing DIBELS and GRADE, with a discussion of the limitations in research on both assessments.

Need for Early Intervention

One of the most important challenges teachers have in the primary grades is teaching students to read (Good & Simmons, 1998). Cunningham and Stanovich (1997) found that reading ability in first grade was a strong predictor of 11th grade reading measures. Likewise, Juel (1988) found that there was an 88% chance that a student who was a poor reader in first grade would be a poor reader in fourth grade. Poor reading ability has been linked to social problems, high school dropout, teen pregnancies, unemployment, and homelessness (Kaminski & Good, 1996). Despite knowledge of the risk factors, such difficulties are still prevalent in the schools, with one in six children experiencing trouble in reading in the first grade (Good & Simmons, 1998).

Early Literacy Development

If children are expected to read by third grade, as required by current legislation, schools need to identify struggling readers at a much earlier age. In order to identify the children who are experiencing reading difficulties so that early intervention techniques can be implemented, it is necessary to understand the foundations of typical reading development. Much is written on reading development in the position statements by the National Association for the Education of Young Children (NAEYC; Neuman, Copple, & Bredekamp, 2000) as well as a National Reading Panel (National Reading Panel, n.d.). The Big Ideas in Beginning Reading were developed as a result of research done through the University of Oregon (Big Ideas in Beginning Reading, 2003). The contributions of these developments in reading research and theory to our understanding of early literacy development are discussed below.

National Association for the Education of Young Children

In 1998, the National Association for the Education of Young Children (NAEYC) and the International Reading Association (IRA) unanimously approved a position statement, "Learning to Read and Write: Developmentally Appropriate Practices for Young Children," that reflected the best practices in teaching reading according to early childhood educators and reading specialists (Neuman, Copple, & Bredekamp, 2000). This statement outlined five phases in a continuum of reading development. The area of reading development examined in this study is defined in the second phase. Phase two usually begins around the time children enter Kindergarten. During this phase, young children learn to understand the connection between written and spoken words through their interactions with reading and writing. In order to better understand how reading

develops and what instructional techniques are most appropriate, The National Reading Panel was formed in 1997 to further identify the skills of reading development.

National Reading Panel

In 1997, Congress requested that the Secretary of Education work with the National Institute of Children Health and Human Development to create a national panel to evaluate research on reading development and instruction (National Reading Panel, n.d.). The Panel spent over a year analyzing the research that has been completed on reading development and provided recommendations to teacher training programs, schools, and even parents on how to help develop reading ability. Through the work of the Panel, five topics were selected for intensive study. These were: alphabetics (phonemic awareness and phonics), fluency, comprehension, teacher education and reading instruction, and computer technology and reading instruction (National Reading Panel, n.d.). Pertinent to this study was the Panel's findings on alphabetics and fluency in relation to reading development.

The findings of the National Reading Panel showed that specific instruction on phonemic awareness increased students' reading ability. Significant benefits of phonetic instruction were found for students in Kindergarten through Sixth grade. Reading fluency was also found to be a critical factor in reading success. The National Reading Panel also determined that oral reading instruction was more effective than independent silent reading on a student's fluency development. Another study of reading development, done by researches with the University of Oregon, found similar factors in the acquisition of reading skills and are referred to as the Big Ideas in Beginning Reading (Big Ideas in Beginning Reading, 2003).

Big Ideas in Beginning Reading

Reading specialists from the University of Oregon identified the following five factors to be critical in reading development: phonemic awareness, alphabetic principle, fluency with text, vocabulary, and comprehension (Big Ideas in Beginning Reading, 2003). The website http://reading.uoregon.edu/big_ideas provides in-depth definitions of each of the five foundational skills and provides a comprehensive list of research references which support the rationale for skills to be included in the five ideas. For the purposes of this study, phonemic awareness, alphabetic principle, and vocabulary are reviewed below as they are areas measured by the DIBELS and GRADE assessments.

Phonemic Awareness. Phonemic or phonological awareness refers to the awareness of phonemes, or individual units of sounds in words (Richgels, 2002). Phonological awareness has been defined by Goswami (2002) as “the progression in representing in the brain the speech units that make up different words” (p. 111). Relative to print awareness and oral language research, a considerably larger portion of research has been devoted to the area of phonological awareness as it pertains to early reading development (Goswami, 2000; Stahl, 2002). The research on phonological awareness and reading acquisition suggests a significant and strong relationship exists between phonological awareness and later reading skills (Morrow, 1999; Kaminski & Good, 1996 Stanovich, 1986). The relationship suggests that children need to recognize the sounds that make up words to develop the ability to segment out specific sounds and then blend them together when reading (Morrow, 1999). Without such awareness, letter-sound correspondence alone would not hold much meaning for the reader (Kaminski & Good, 1996). As pointed out by Stanovich (1986), phonological awareness is the skill

needed for the discovery of the alphabetic principle, or print awareness so that children can use the sounds of letters in order to decode words.

Print Awareness. Print awareness involves knowledge of the letters of the alphabet, and the decoding of letters into sounds (Whitehurst & Lonigan, 2002). This knowledge is a prerequisite to reading words (Big Ideas in Beginning Reading, 2003). A significant amount of research has examined the relationship between print awareness and later reading ability (Ehri, 1991; Vellutino & Denckla, 1991). Research consistently indicates that knowledge of letter names at the time of Kindergarten entry provides a strong prediction of reading achievement (Whitehurst & Lonigan, 2002; Kaminiski & Good, 1996). As print awareness skills progress, reading becomes more automatic because children are able to recognize letters and corresponding sounds with increasing fluency (Juel, 1991). Conversely, a child who has difficulty identifying letters and corresponding sounds will have a hard time learning to read words created by individual letters (Whitehurst & Lonigan, 2002).

Vocabulary. Vocabulary or language development has a strong relationship with later academic success (Kaminski & Good, 1996). While research has focused on why oral language develops (McCardle, Scarborough, & Catts, 2001), this review focuses on literature and studies relevant to the need for strong vocabulary skills foundational for reading. It has been found that children who enter Kindergarten with weaker verbal skills are more likely to have difficulty learning to read (Scarborough, 2002). Oral language skills are most closely related to the comprehension of written language and the greatest effects of such deficits are seen around second grade when the understanding of the written word is emphasized (Scarborough, 2002). This is because being able to identify

letters, sounds, and create words will not help a child if he or she does not understand the word in spoken form.

Assessment of Reading Skills

Overall, early literacy development requires several interrelated skills to be developed, as discussed above. Attempts to identify children “at-risk” for later reading difficulties typically address these skills in some form of assessment. Given recent legislation, various assessment strategies have been considered (Sofie & Riccio, 2002). The types of assessment currently available for use in identifying children who are “at risk” for reading difficulties fall into two general categories: standardized norm-referenced tests and curriculum-based assessments.

Standardized Norm-referenced Tests

Standardized norm-referenced tests compare a student’s performance on a group of reading tasks to the performance of a normative sample of children. The results are easy to interpret and achievement levels can be compared to a large sample of children. However, standardized norm-referenced tests typically measure broad skill areas. The tests may not represent actual tasks that students are required to do in a classroom setting (Sophie & Riccio, 2002). To demonstrate adequate measurement properties, norm-referenced assessments generally take a longer time to administer. Further, because of the lack of relatedness to a specific curriculum as well as the types of scores generated, norm-referenced assessments are not useful for the purpose of progress monitoring over short periods of time (e.g., weeks or months). Similarly, norm-referenced assessments are not typically adequate for evaluating the effectiveness of interventions that have been tried with students who are struggling with learning.

A number of norm-referenced assessments of early reading skills exist. The Test of Early Reading Ability (TERA; Pearson Assessment, n.d.) is an individually administered test that can be used with children ages 3-6 through 8-6. The TERA measures letter identification, concepts of print, and gaining meaning from print. The Woodcock-Johnson Tests of Achievement-3rd Edition (WJ3; Riverside Publishing, n.d.) is another individually administered test that can be used with children as young as age two, and reading skills are measured through basic reading skills, reading comprehension, and reading fluency subtests. The GRADE, another norm-referenced test, is group administered. The GRADE assesses phonological awareness, visual skills, and concepts. The GRADE will be discussed in depth later in this chapter.

Curriculum-based Measurement

Curriculum-based Measurements (CBM) was developed to provide teachers with a system to a) accurately measure academic growth, b) provide a way to measure the success of learning programs, and c) create better academic programs (Deno, 1985; Fuchs & Fuchs, 2002). The greatest amount of research on CBM's has been in the area of reading. Reading CBM's have proven useful for identifying reading problems in children (Good & Simmons, 1998), and planning and monitoring interventions for students struggling in reading (Shinn & Bamonto, 1998). The most frequently cited criticism of CBM is the lack of knowledge among school professionals with regard to how to choose appropriate CBM's (Elliot & Fuchs, 1997).

Most CBM's involve a set of short fluency measures used to assess academic skills (Shinn & Bamonto, 1998). For any academic area, the measures chosen are that are the best "dynamic indicators of basic skills," also referred to as DIBS (Shinn & Bamonto,

1998). *Dynamic* refers to the sensitivity of the measure both at the group and at the individual level. While norm-referenced tests of achievement are dynamic among groups of people, they are not generally able to identify changes or differences in performance at the level of the individual student. CBM measures will detect the growth within a person. *Indicators* are meant to provide an idea of a student's performance. The indicators of CBM measure just a small area, for example the number of words read correctly in one minute. This oral reading fluency has been shown to be a strong indicator of a student's reading ability (Fuchs & Fuchs, 2002). As such, oral reading fluency can be used to get an idea of how well a student reads and comprehends.

Group Reading Assessment and Diagnostic Evaluation

One example of a standardized norm-referenced test to identify children at-risk for reading difficulties is the Group Reading Assessment and Diagnostic Evaluation (GRADE; Williams, 2001). Authors argue that it can also be used to identify growth from one year to the next. The GRADE consists of 11 levels ranging from Pre-Kindergarten through Adult. For the purpose of this study, the Pre-Kindergarten level will be discussed. The Pre-K level includes measures of phonological awareness, visual skills, and concepts. Scores derived from the Pre-Kindergarten level are reported in stanines for each of the domain areas. In addition, a total test score is reported as a stanine, percentile, grade equivalent, standard score, normal curve equivalent, and a growth scale value. The norming group at the pre-Kindergarten level is age based; whereas, the other levels are grade-based (AGS Publishing, 2005).

In relationship to the Big Ideas in Beginning Reading, the GRADE appears to measure phonological awareness and oral language skills through sound matching and

rhyming subtests as well as concept subtests. While there is a visual skill composite, it does not directly measure a student's ability to identify or name letters. Fugate and Waterman's (2001) study of the GRADE indicates that the test "appears to be predicated on sound reading theory with appropriate developmental sequences of skills surveyed at each of the levels."

Validity and reliability studies appear to have been done primarily by the publishing company (Fugate & Waterman, 2001). AGS Publishing (2005) reported internal reliability to be strong (.95-.99). Alternate form reliability was high (.81-.94) and test-retest reliability median was high (.80). Concurrent validity studies were only completed with the test level used in grades 1-6. For this level, correlations between the GRADE and the Iowa Test of Basic Skills were moderate to strong (.69 to .90). The GRADE was also strongly correlated (.86 to .90) with the Gates-MacGinitie Reading Tests (.86 to .90). Predictive validity between the GRADE and the TerraNova was studied at grades 2, 4, and 6 and was determined to be moderate to strong (.76 to .86). There have been no validity studies done at the earliest levels of this test (i.e., Pre-Kindergarten and Kindergarten).

Dynamic Indicators of Basic Early Literacy Skills

The curriculum-based measures for reading originally developed by Deno (1985) measured oral reading fluency, or the number of words a child could read per minute in a grade level passage. However, oral reading fluency measures are not appropriate for children who have not yet begun to read. Kaminski and Good (1998) developed the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), which are short fluency measures designed to assess the progress young children make as they develop important

early reading skills (Elliot et al., 2001). The measures were designed to be easy to administer, easily understood by parents and educators, and sensitive to change; much like the criteria used for the development of other CBM's (Kaminski & Good, 1998).

DIBELS were created to be used with children in preschool through second or third grade (Good & Kaminski, 2002) and are linked to specific early literacy skills. The areas assessed by DIBELS parallel foundational skills proven to be necessary to reading development: phonological awareness, print or alphabetic awareness, and fluency with connected text (Good & Kaminski, 2002). By identifying initial sounds in words and segmenting words, a student's phonological awareness is measured. Identifying letters and reading words provides the measures of print awareness and fluency with text. At the Kindergarten level, Initial Sound Fluency and Letter Naming Fluency are measured at the beginning of the year. Phoneme Segmentation Fluency and Nonsense Word Fluency are added measures at the middle of the year and Initial Sound Fluency no longer measured.

The reliability and validity of DIBELS have been well researched. Elliott, Lee, and Tollefson (2001) specifically examined the technical adequacy of the DIBELS measures used in Kindergarten. Interrater reliability estimates were strongest for Letter Naming Fluency (.94). The weakest reliability was Sound Naming Fluency (.82). Sound Naming Fluency was part of the original DIBELS assessment and is no longer given. Test-retest reliability of the DIBELS was also moderate to strong. After a two week testing interval, Letter Naming Fluency had the strongest reliabilities (.90) and Phonemic Segmentation Ability the weakest (.85). Concurrent validity studies between DIBELS and Woodcock-Johnson Tests of Achievement Revised (WJ-R) academic skills cluster indicated moderate to strong correlations ranging from the weakest correlation between

Phonemic Segmentation Fluency (.60) and the strongest with Letter Naming Fluency (.75) measures of DIBELS. The concurrent validity of DIBELS and the Comprehensive Test of Phonological Processing (CTOPP) was examined by Hintze, Ryan, and Stoner, 2003. The DIBELS measures of Initial Sound Fluency (ISF) and Phonemic Segmentation Fluency (PSF) were compared with the CTOPP Phonological Awareness Composite (PACom) and the Phonological Memory Composite (PMCom). ISF correlated highly with both PACom (1.00) and PMCom (.91). PSF had high correlations as well with PACom (.93) and PMCom (1.00).

Critical Analysis

Considerable research (Whitehurst & Lonigan, 2002; Neuman et al., 2000; Morrow, 1999; Kaminski & Good, 1996) has been done in the area of basic early literacy development and the foundational skills involved. If the goal of educators is early intervention, this information needs to be linked with assessment techniques most predictive of identifying students at-risk for reading difficulties. There is a lack of research comparing the GRADE with DIBELS, while the validity between DIBELS and other norm-referenced tests seems to be well researched (Elliott, Lee, & Tollefson, 2001). A review of DIBELS and GRADE suggests that each provides some measure of an early reading skill consistent with the Big Ideas in Beginning Reading (2003), there is significant lack of evidence of the rationale behind the development of several composite areas on the GRADE.

Chapter III: Methodology

This chapter outlines procedures involved in evaluating the following research questions:

1. What is the relationship between the composite scores of the GRADE and the DIBELS measures of Initial Sound Fluency and Letter Naming Fluency?
2. Do these assessments identify the same students as being at-risk for reading difficulties?

The selection of subjects and the sample demographics are first described. The GRADE and DIBELS assessments are defined in detail followed by a description of the methodology used in the data analysis.

Participants

The participants involved in this study include Kindergarten students who were evaluated during the 2005-2006 school year in accordance with the school district's reading curriculum. All participants attended Kindergarten in an elementary school located in west central Wisconsin. District enrollment for the 2005-2006 school year was 2400 students (WINNS Successful School Guide Data Analyses, n.d.), and the elementary school involved in this study had an enrollment of 601, of which 17.6% were in Kindergarten. The school's population was 92.3% white and approximately 10% of the students qualified for the free or reduced lunch program. Data from 106 students was included in the final analysis. 48% of these students were female and 52% were male.

Materials

Dynamic Indicators of Basic Early Literacy Skill

Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Kaminski & Good, 2002) is a form of curriculum-based measurement. The assessments included in this study were the two fluency probes of Initial sound fluency (ISF) and Letter Naming Fluency (LNF). Although the DIBELS authors recommend multiple benchmark assessments throughout the school year, only data from the beginning of the school benchmark was included for the purposes of this study. A student's raw score level performance on both beginning of the year benchmarks can be converted into the instructional recommendation of either "at risk," "some risk," or "low risk" (Good & Kaminski, 2002). The pattern of instructional recommendations across both scores can then be compared to data that identifies the percentage of children with a similar pattern of scores who achieve subsequent literacy goals on DIBELS measurements, as well as the rate at which they achieve later goals. Comparing a child's pattern of response to the accumulated DIBELS data provided at the DIBELS website allows for an instructional support recommendation of either "intensive-needs substantial intervention," "strategic-additional intervention," "benchmark-at grade level," which were determined for the current study.

Initial Sound Fluency. ISF measures are intended for children in the last years of preschool through the middle of Kindergarten (Good & Kaminski, 2002). ISF requires the child to identify pictures that begin with specific sounds. This task is timed for one minute. The child is shown four pictures and the examiner names each picture. For example: cat, house, tree, and dog. Then the examiner asks the child to point to the

picture that begins with the /c/ sound with the intent that the child would choose the cat. Raw scores are used to derive a percentile rank as well as to define a student's risk based on their skill level. Students who identify less than four initial sounds are considered to be "at-risk." Students with raw scores greater than four and less than eight are considered to have "some risk." Students with raw scores eight or greater are considered to have "low risk."

Letter Naming Fluency. LNF is a measure of how many letters a child can identify in one minute when given a page of both upper and lower case letters (Good & Kaminski, 2002). This measure is used with most children from the fall of Kindergarten through the fall of their first grade year. Raw scores are again used to derive a percentile rank as well as to define a student's risk based on their skill level. Students who identify less than two letters are considered to be "at-risk." Students with raw scores greater than two and less than eight are considered to have "some risk." Students with raw scores of eight or greater are considered to have "low risk."

Group Reading Assessment and Diagnostic Evaluation

Level P of the GRADE was administered in its entirety to Kindergarten at the beginning of the school year. This is a group administered, standardized, and norm-referenced test. None of the tasks are timed. For children assessed in Kindergarten, the GRADE provides an overall composite score as well as three cluster scores. The composite and cluster scores are reported as standard scores and percentiles. For the purposes of identifying students at-risk and in need of intervention, the school district from which data for this study was acquired identified performance at the 40th percentile or lower as the cut off score. Children performing at the 40th percentile or lower were

provided additional academic support for the year. GRADE cluster scores and the subtests contributing to them are described below.

Phonological Awareness. Rhyming and Sound Matching subtests create the Phonological Awareness Composite. These tasks use a set of pictures, and students find the corresponding picture to match the initial sound, final sound, or a rhyming word from a teacher prompt. After completing two training items, the child completes fourteen questions in the rhyming subtest. The prompt word is said by the teacher first, followed by a label for each of the pictures. For example: “Find the picture that rhymes with cat.” The pictures are man, tree, hat, and chair. Sound Matching consists of two training items in the initial sound subset and two in the final sound subset. Each subset also consists of six questions. Similar to the rhyming subtest, the prompt sound is given first followed by a label for each of the four pictures presented.

Visual Skills. Picture Matching and Picture Differences subtest indicate a student’s Visual Skills cluster composite. On each subtest, the child is given two trial examples. Picture Matching consists of ten questions where the student is given four pictures and needs to find the one that matches a visual prompt within that row. Picture Differences consists of eight questions and the students chooses one of four pictures that is different from the others.

Concepts. The Concepts cluster composite is measured through the Verbal Concepts and Picture Categories tests. Verbal concepts requires the student to identify the picture that best represents a concept (under, next to, behind) that is said aloud by the examiner. After two trial questions there are ten questions. The Picture Categories subtest presents the student with four pictures and the student is to form a category and identify

which picture does not belong within the set or category. Ten questions make up this subtest.

Procedure

The GRADE assessment was administered by classroom teachers in the Kindergarten classroom. The assessment was completed over several days and occurred within the first month of school. Teachers followed standardized administration procedures. DIBELS measures were completed during the first week of school during the K-Start program, which provides a one hour time for each student and his/her parents to meet with the Kindergarten teacher before actually coming to school for a full day. The ISF and LNF probes were administered by the classroom teacher following standardized procedures.

Data Collection

The scores of 109 Kindergarten students were collected by the reading specialist to determine which students required additional interventions. For this study, test score data for the 2005/2006 school year was obtained one and a half years after administration. In accordance with the Institutional Review Board for the Protection of Human Subjects, all identifying information was removed from the data set prior to inclusion on the present investigation. The scores were analyzed to determine the concurrent validity and to answer the research questions related to how well each identified students in need of additional academic support.

Data Analysis

The information gathered was analyzed as follows to answer the proposed research questions:

Question One

Question one addressed the concurrent validity of the GRADE through a comparison with DIBELS. To examine this relationship, Pearson product-moment correlation coefficients were computed between the GRADE cluster and composite scores and the two DIBELS fluency measures, Initial Sound Fluency and Letter Naming Fluency.

Question Two

The second research question considered the relationship of the GRADE and DIBELS in identifying students who were at-risk of difficulties in reading. Frequency analysis of the number of students in each diagnostic category was computed. The categories were evaluated according the following:

1. *True-Positive: the number of students identified by the GRADE as well as by DIBELS as requiring intervention.*
2. *True-Negative: the number of students identified by the GRADE as well as by DIBELS as not requiring intervention.*
3. *False-Positive: the number of students identified by the GRADE but not by DIBELS as needing intervention.*
4. *False-Negative: the number of students not identified by the GRADE but identified by DIBELS as needing intervention.*

Chapter IV: Results

This chapter presents the results related to the concurrent validity of the GRADE and DIBELS measures, and the relationship accuracy of the GRADE and DIBELS in identifying students at risk for difficulties with reading acquisition. Mean scores, standard deviations, Pearson correlations, and diagnostic efficiency statistics were used to address the research questions presented.

Preliminary Analyses

Data Screening

The data collected and recorded by the reading specialist included three Kindergarten students who were not administered both assessments tools due to their absence or starting school at a later time. These scores were removed and the remaining number of participants totaled 106. No significant outliers were present in the data.

Descriptive Statistics

The mean and standard deviation of the GRADE composite scores are provided in Table 1 along with the mean and standard deviations for the raw scores on the DIBELS measures of ISF and LNF. The mean stanines on the GRADE ranged from 5.23 to 5.73, and the total standard score mean was 102.88. The mean raw score for ISF was 13.96 and the mean score for LNF was 19.59.

Table 1 *Means and Standard Deviations of GRADE and DIBELS*

Measure	<i>M</i>	<i>SD</i>
GRADE		
Phonological Awareness Stanine	5.23	1.73
Visual Skills Stanine	5.73	1.51
Concepts Stanine	5.44	1.69
Total Test Stanine	5.39	1.61
Total Test Standard Score	102.88	11.9
DIBELS		
Initial Sound Fluency (Raw Score)	13.96	9.81
Letter Naming Fluency (Raw Score)	19.59	15.19

Research Question One

Question one addressed the concurrent validity of the GRADE composite scores with the two fluency probes from the DIBELS. Table 2 shows the Pearson product-moment correlation coefficients between scores. There was a moderate to strong correlation between the Phonological Awareness Composite and ISF ($r = .56$) and LNF ($r = .60$). Similar to the Phonological Awareness composite, the total test score from the GRADE also produced moderate to strong correlations with ISF ($r = .50$) and LNF ($r = .61$). These patterns of correlations suggest that the GRADE Phonological Awareness Composite and the DIBELS measures share 31% and 36% of common variance, respectively.

The remaining GRADE composites demonstrated weaker relationships with the two DIBELS measures. The Visual Skills composite from the GRADE resulted in a low correlation with ISF ($r = .33$) and with LNF ($r = .42$). The Concepts composite from the GRADE also produced a low correlation with ISF ($r = .19$) and LNF ($r = .33$). At the most, the GRADE Visual Skills and Concept composites shared only 17% common variance. These results suggest they measure distinctly different skills.

Table 2 Correlations Between Measures

DIBELS	Initial Sound Fluency	Letter Naming Fluency
GRADE	<i>r</i>	<i>r</i>
Phonological Awareness	.56	.60
Visual Skills	.33	.42
Concepts	.19	.33
Total Test	.50	.61

Research Question Two

The second research question examined the accuracy of the GRADE and DIBELS in identifying similar students as being at risk for later reading difficulties. The district defined cut-off scores for each battery used in the comparative analysis. This examination was intended to evaluate the effectiveness of the policy for identifying children for additional reading support. The school district considered students scoring below the 40th percentile on the GRADE total composite score to be at-risk and in need of remediation. The elementary school involved in this study also considered students who were

identified as being in the strategic and intensive instructional categories on the DIBELS probes to be at-risk and in need of remediation.

Table 3 shows the true-positive rate as 26.4%, or 28 of the students, were considered at-risk and requiring intervention on both measures. The true-negative rate was 53.8%, or 57 students, were considered to be at benchmark by both indicators. The false positive rate was 4.7%, or 5 students, that were identified by the GRADE, but not by DIBELS as being at-risk. The false negative, students not identified by the GRADE but by DIBELS, was 15.1%, or 16 students. In general, the two measures resulted in similar recommendations 80% of the time, and discrepant recommendations regarding the need for further intervention 20% of the time. The DIBELS measures identified 41.5% ($n = 44$) of the sample as at risk, while the GRADE identified 31.1% ($n = 33$) children as at risk.

Table 3 *Diagnostic Accuracy of the GRADE and DIBELS*

	<i>n</i>	<i>P</i>
True-positive ^a	28	26.4%
True-negative ^b	57	53.8%
False-positive ^c	5	4.7%
False-negative ^d	16	15.1%

Note. ^aTrue-Positive: the number of students identified by the GRADE as well as by DIBELS as requiring intervention.

^bTrue-Negative: the number of students identified by the GRADE as well as by DIBELS as not requiring intervention.

^cFalse-Positive: the number of students identified by the GRADE, but not by DIBELS, as needing intervention.

^dFalse-Negative: the number of students not identified by the GRADE, but identified by DIBELS, as needing interventions.

Chapter V: Discussion

The need for early interventions for struggling readers is made clear by the research that has been conducted on the effects of poor academic skills (Kaminski & Good, 1996; Juel, 1998; Cunningham & Stanovich, 1997). In response to the implications of poor literacy skills, legislation has been written to ensure success for all students by emphasizing the need for early identification and early intervention with children at risk for reading difficulties (No Child Left Behind, n.d.; Kovalesski & Prasse, n.d). To determine which students are at-risk for reading difficulties, various assessment tools have been developed. Two of these tools, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) and the Group Reading Assessment and Diagnostic Evaluation (GRADE) were reviewed in this study. This chapter will discuss the findings of the study as well as limitations of the study. The implications for practitioners and for future research will also be discussed.

Research Question One

Question one addressed the concurrent validity of the GRADE composite scores with the two fluency probes from the DIBELS. Moderate correlations were found between the GRADE Phonological Awareness Composite and ISF as well as LNF from the DIBELS, suggesting good convergent validity across measures designed to measure phonological awareness. In fact, the relationship between the GRADE Phonological Awareness cluster and DIBELS LNF was slightly higher than its relationship with the ISF measure. While a strong correlation between Phonological Awareness and ISF would be expected due to the similar nature of the tasks, the GRADE Phonological Awareness subtest does not include any letter recognition tasks. The strong correlation between the

composite and LNF may be due to the fact that both letter recognition and phonological awareness are good predictors of later reading skills (Morrow, 1999; Kaminski & Good, 1996; Stanovich, 1986; Whitehurst & Lonigan, 2002). Given this finding, practitioners should use caution when interpreting results of the GRADE since it does not include a measure of letter identification and there is a proven correlation between that ability and reading success (Whitehurst & Lonigan, 2002).

Apart from the relationship between the Phonological Awareness cluster of the GRADE and the two DIBELS measures; the remaining correlations between the GRADE composites and DIBELS fluency measures were all found to be low. Thus, the two assessments appear to measure different constructs. One reason the remaining correlations are low may be because the constructs measured by the GRADE (i.e., visual skills and concepts) have not been shown to be strong predictors of reading success. While the technical manual of the GRADE does provide a comprehensive list of research pertaining to the development of the composite areas on the upper levels, there does not seem to be any research supporting the inclusion of visual skills and concepts subtests.

Interestingly, the GRADE Concepts cluster also was not significantly related to the DIBELS measures. It could be argued that a knowledge of basic concept words is essential due to the findings substantiating a relationship between vocabulary and reading; however, it is important to note that the greatest impact of oral language deficits on reading performance is not apparent until around second grade (Scarborough, 2002). As a result, these findings suggest that a student's grasp of basic concepts in Kindergarten is a poor predictor of later reading ability; however, vocabulary knowledge has been found to be an important skill to assess in later grades.

The low correlations between the GRADE and DIBELS measures also may have been due to the effects of using timed tasks on only one of the two measures. Or, similarly, the impact that administering the GRADE in a group setting may have on a child's overall performance. These factors will be discussed later with regard to implications for practitioners. Overall, practitioners should be aware that while low performance on the GRADE Concepts Composite may indicate a need for remediation, the Phonological Awareness cluster of the GRADE is likely the stronger predictor of early reading skills at this age.

Research Question Two

The second question considered the consistency and accuracy with which the DIBELS and GRADE identified students considered at-risk for reading difficulties. Using these assessments to make determinations regarding whether or not a child needs intervention poses the question of whether or not they are adequate for screening purposes. As reported by Gredler (1992), screening tools are used to determine which students may be at-risk for various learning problems. Screening tools used with young children should be at least 75% accurate. Results indicate the GRADE and the DIBELS were consistent in their identification of 80.2% of the students. The false negatives, those only identified by DIBELS made up 15.1% of the sample. The false positives, those only identified by the GRADE as needing intervention, was 4.7% of the sample. To determine if these rates are acceptable, further predictive validity studies should be completed. This will be discussed later in the chapter.

Further Implications

With current legislation requiring schools to ensure the reading success of all students, appropriate assessment materials are necessary to accurately identify students at-risk for reading difficulties in the early grades. Assessing students at a young age is difficult due to the low reliability of their performance and the unstable behavior patterns they may demonstrate in testing (Gredler, 1992). The results of this study do indicate moderate to strong correlations between some measures of the GRADE and DIBELS. However, when examining the composite areas on the GRADE, it does not appear that the skills measured by the GRADE are consistent with the Big Ideas in Beginning Reading. DIBELS measures have been well researched; and, therefore, may be considered more accurate estimates of a student's early reading skills and risk for later reading difficulties. Given DIBELS measures do not correlate highly with the GRADE, other than with the Phonological Awareness Composite, these results suggest the other GRADE composite scores are not as important for use with Kindergarten students. Future research is needed to determine the predictive validity of the GRADE measures.

Since the overall GRADE score had a strong correlation to the DIBELS measures, it could be argued that only using the GRADE to determine students at-risk of reading difficulties would be sufficient and time effective since the GRADE can be group administered. The GRADE may be more time efficient to administer, but additional time is required to score, interpret, and compile the results. Further, practitioners must recognize that the GRADE can not be used to monitor a student's progress and the effectiveness of an intervention. Therefore, additional testing would still need to be done with identified students in order to monitor their progress over time. Practitioners should

weigh both the administration strengths and weaknesses of both batteries with the breadth and value of information provided when making decisions regarding which assessment tool may best serve the needs of their district.

Limitations

While this study adds to the research on the early identification of children “at risk” for later reading difficulties and specifically adds to the research on the GRADE and DIBELS assessments, a number of limitations are present in the study. First, the study only included students from one school district in west-central Wisconsin. To generalize the results more readily, additional research including greater geographic locations with students of varying English language proficiency, and socio-economic status may be beneficial. The assumption was made that each test was administered according to standardization rules; however, the data analyzed in this study was archival in nature. As a result, administration procedures were not controlled.

Future Research

The GRADE has little research supporting the concurrent validity with other assessments at both the earliest levels and at the high school level. Since correlations were moderate between the overall test and the two DIBELS measures, results suggest that the GRADE Phonological Awareness cluster could be an adequate measure of early reading skills. Further research should be done to establish the concurrent validity of the GRADE, however. Identifying concurrent validity of assessing various sub-groups such as English language learners or students with speech and language disabilities would be appropriate.

Additional research areas could consider the predictive validity of the GRADE as well as DIBELS. Since two of the GRADE composite scores had low correlations with DIBELS, additional studies should examine which measures are most related to future measures of reading achievement. Sixteen students, or 15%, were identified as being at-risk by the DIBELS. These same students were not identified by the GRADE. Predictive validity of the DIBELS would also be beneficial in determining if that rate is acceptable.

While there were some moderate correlations between the GRADE and DIBELS, there remain some questions regarding the low correlation between the GRADE Visual Skills composite and DIBELS as well as between the GRADE Concepts composite and the DIBELS. Further investigation into the administration procedures of these assessments may be beneficial in determining the most appropriate means of assessing the early reading skills of young children. Identifying the effects of being timed, as on the DIBELS measures, could lead to better use of curriculum-based measures with young children. In addition, DIBELS evaluations are completed in a one to one setting. As such the administrator may be able to establish better rapport with the student to maximize student performance. The GRADE assessment is done in a large group with young children and the results may or may not be an adequate reflection of a student's early reading skill. Further research on these aspects may lead to the better development of testing procedures and utility of assessments with young children.

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