Measuring the Predictive Power of Dynamic Indicators of Basic Early Literacy Skills

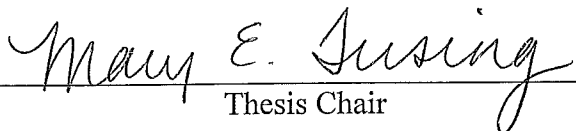across Grade Levels for English Language Learners
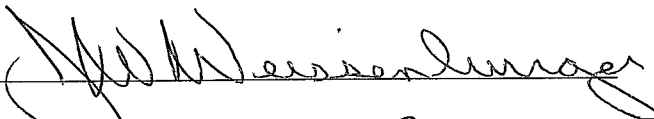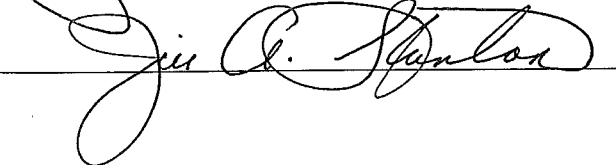
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A Research Paper
Submitted in Partial Fulfillment of the
Requirements for the Degree of Education Specialist
With a Major in

School Psychology

Approved: 6 Semester Credits

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University of Wisconsin- Stout
August 2009

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Title: *Measuring the Predictive Power of Dynamic Indicators of Basic Early*

Literacy Skills across Grade Levels Among English Language Learners

Graduate Degree/ Major: Ed.S. School Psychology

Research Advisor: Mary Beth Tusing, Ph.D.

Month/Year: August, 2009

Number of Pages: 48

Style Manual Used: American Psychological Association, 5th Edition

ABSTRACT

The field of education has never been under more pressure to successfully teach children how to read. Legislation has now mandated public schools to use state testing exams to demonstrate their students are making adequate gains in the area of reading (U.S. Department of Education, 2006). Legislation also requires English Language Learners (ELL) to demonstrate the same progress as English only speaking students. As a result, there has been a significant increase in the use of screening assessments for the early identification of students who may be at risk for reading failure. One such measure, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) is examined for its ability to predict later performance on second grade DIBELS measures, specifically with ELLs. The relationship between kindergarten DIBELS measures and end of second grade Oral Reading Fluency (ORF) was examined. Results indicated moderate correlations between some kindergarten DIBELS measures and second grade ORF. The remaining

kindergarten measures did not demonstrate adequate correlations with second grade ORF. Letter Naming Fluency (LNF) was found to be the best kindergarten predictor of later ORF performance for ELLs, while kindergarten Nonsense Word Fluency (NWF) demonstrated the weakest relationship between second grade ORF measures. Findings are discussed with regard to implications for practice and future research.

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Chapter I: Introduction

Public schools in the United States continue to see an increase in the enrollment of English Language Learners (ELLs). In the last ten years, there has been a 60% increase, with a total of more than 5 million ELL students attending U.S. public schools (National Clearinghouse for English Language Acquisition and Language Instruction Educational Programs, 2006). While both coastal regions have seen tremendous growth, even Midwest states such as Minnesota and Wisconsin have seen a dramatic increase of ELLs. In the last ten years, Minnesota has seen a 161% increase in ELLs, while Wisconsin has had an increase of 71% (National Clearinghouse for English Language Acquisition and Language Instruction Educational Programs, 2006). Currently, 85 different languages are spoken in the state of Wisconsin's public schools (Wisconsin Department of Instruction, 2007). Many of these students come from homes in which English is not spoken at all.

While facing the challenge of educating increasing numbers of English Language Learners, schools are also required to demonstrate that all students, including ELLs, show adequate yearly progress on state tests. The No Child Left Behind (NCLB) Act requires schools to annually assess the progress of their students using state assessments. Schools are required to report the results/performance of their students to national agencies (U.S. Department of Education, 2006). Schools that do not show their students are making adequate yearly progress (AYP) are penalized by receiving less federal government money. Along with other specific groups of learners (i.e., special education students, minorities), districts must provide evidence of improvements in the academic progress of ELLs. A major challenge behind requiring schools to show AYP is those schools with

large ELL populations, as they must make the same progress as schools made up of predominately non-ELLs (National Clearing House for Language Acquisition and Language Instruction Educational Programs, 2006).

Currently, state data shows that most ELLs are not performing well on reading assessments. In 2005, only 27% of fourth grade ELLs scored at or above "basic level" of performance and only 7% performed at a "proficient level" on state mandated reading assessments in the United States (National Center for Education Statistics, 2006). Only 4% of eighth grade ELL students performed at the "proficient level" in comparison to 32% of non-ELL students. In addition to under-performing on state reading assessments, data also suggests that ELL students are over-represented in special education as having learning disabilities. Zehler and colleagues (2003) analyzed the actual number of ELLs identified as qualifying for special education services to non-ELL students identified with disabilities. During the 2001-2002 school year, 357,300 K-12 ELLs were identified as learning disabled. This represents approximately 9% of the K-12 ELL population and 8% of all students in special education. These staggering numbers provide evidence of a problem when it is far too late.

Unfortunately, analyzing state assessments and special education representation only identifies the educational problems for ELLs when it is far too late. It is evident an alternative method to identify students who are struggling in the area of reading needs to be utilized prior to state testing exams. Proactive identification methods would allow students to make reading gains and potentially perform better on the state tests required by NCLB. Schools need to consider the use of Curriculum Based Measurement (CBM) to identify those at risk for reading failure and, those at risk for not passing state tests,

and to monitor how students respond to a method of instruction. The use of progress monitoring would allow educators to identify students who are in need of addition assistance or intensive intervention. Progress monitoring tools allow for specific skill areas to be identified and worked on when necessary with students who are struggling.

As briefly mentioned earlier, schools are in need of an alternative method to assess the progress of ELLs in the area of reading. It appears as though using state testing scores to identify a problem is more a "wait to fail" approach. Many schools are now shifting to the use of Response to Intervention (RtI) to identify students who are struggling to read. Under the use of RtI, schools often use curriculum based measures (CBM) to identify students who are in need of intensive intervention. CBM is used as a method of formative evaluation to continually assess during instruction to determine whether the student is making adequate gains (Shinn & Bamonto, 1998). CBM are especially beneficial when used in the early grades to identify and monitor the progress of at risk learners. Not only does CBM allow educators to identify students before it may be too late, it also allows for the provision of intensive reading interventions prior to state mandated academic tests.

Statement of the Problem

A vast amount of support exists regarding the use of CBM's to monitor students reading progress. This method allows educators to provide early intensive reading interventions to students prior to taking state testing exams. The use of CBM's also permits educators to "catch" students who may be at risk for reading failure before it is too late. Unfortunately, a review of the literature indicates that little research exists on the

use of CBM with ELLs. Of the very few studies examining the use of CBM's with ELLs, most existing research has involved Spanish speaking ELLs.

Purpose of the Study

The primary purpose of this study is to examine the utility of Curriculum Based Measurement (CBM); in particular, whether Dynamic Indicators of Basic Early Literacy Skills (DIBELS) kindergarten benchmarks are predictive of ELLs performance on second grade measures of reading. Each benchmark is specifically examined to determine its utility with ELLs.

Research Questions

The following research objectives guided this study:

1. What is the relationship between kindergarten DIBELS measures and later performance on second grade oral reading fluency measures for ELLs?

2. Which kindergarten DIBELS measures are the best predictors of second grade oral reading fluency for ELLs?

Definition of Terms

For clarity of understanding, the following terms are defined.

English Language Learners- Also called English as a Second Language (ESL), ELL students are students who may or may not have been born in the United States, and the primary language spoken at home is one other than English. ELL students lack the language skills necessary for listening comprehension, reading, writing, and speaking proficiently in English. These skill deficits may have a significant impact on the success the student has in regular education classrooms (National Clearinghouse for English Language Acquisition and Language Instruction Educational Programs, 2006).

Curriculum Based Measurement- Curriculum Based Measurement, or CBM, was developed as an alternative to Curriculum Based Assessment (CBA). Unlike CBA, which does not have a unified method of assessment and are not general outcome indicators, CBM's are reliable, valid, and have standardized administration procedures. CBM's are essentially a set of brief measures used to assess basic skills (i.e., reading, writing, spelling, and math) and are sensitive to changes within students' learning. As such, educators can use CBM's to monitor a student's growth in a particular subject area (Shinn & Bamonto, 1998).

Reading Fluency- Refers to the speed and accuracy in which a student is able to read written passages. When a reader is able to read words automatically, little devotion is needed for decoding (breaking down the word for pronunciation); and, as such, the student is able to comprehend text. The term Oral Reading Fluency (ORF) is used frequently throughout this paper, which will be explained further (Shinn, Good, Knutson, & Tilly, 1992).

Chapter II: Literature Review

Chapter one discussed the resent influx of ELLs into U.S. public schools and how this affects the way educators assess their progress in the area of reading. Recent legislation regarding the assessment of ELLs was also highlighted along with the problems regarding how ELLs are fairing on state testing exams. A brief description of CBM's was introduced as an alternative method to continually assess how ELLs are responding to reading instruction. In the current chapter, an alternative approach to standardized assessments will be introduced and explained. A critical analysis of the current research on the predictive validity of Dynamic Indicators of Basic Early Literacy Skills (DIBELS) in predicting second grade oral reading fluency measures for ELLs is also included. A discussion of the current limitations in this area of research follows.

Curriculum Based Measurement

Based upon previously presented statistics regarding the increasing numbers of ELLs in public schools and the over-representation of ELLs identified as LD, along with problems in attempting to fairly assess ELLs academic and intellectual abilities with standardized tools, alternative methods of assessing ELLs academic progress and determining eligibility for special education is needed. Curriculum Based Measurement (CBM) has been offered as a potential alternative to traditional assessment methods; and, as a practice, is better suited for monitoring the academic progress of ELLs (Wiley & Deno, 2005).

CBM is used as a general outcome indicator to measure student achievement (Shinn & Bamonto, 1998). More specifically, CBM helps measure a students' growth in an academic area across a certain time period. A regular practice among school personnel

is to measure a student's understanding of the curriculum at the end of instruction in a summative fashion (Shinn & Bamonto, 1998). CBM, instead, utilizes a formative evaluation method by assessing student performance throughout an instructional period. With CBM, student growth can be compared with the performance levels of other students, classrooms, or districts; and, it can be used to guide decisions about the student's rate of progress and whether or not an intervention needs to be implemented (Deno, Fuchs, Marson, & Shinn, 2001). Students are compared to those receiving the same instruction and attending the same school district (Shinn, 1989). Interventions implemented to promote student growth can also be monitored for their effectiveness using progress monitoring techniques that involve CBM.

With public schools now using high stakes tests to determine adequate yearly progress, or student growth, Wiley and Deno (2005) report CBM can be used as an early screener to predict which students may be at risk for poor performance on state-wide assessments (i.e. Minnesota Comprehensive Assessment). Since NCLB requires ELLs to be included in state assessments and to also demonstrate adequate yearly progress, CBM data could be used to predict which ELLs may be at risk for poor performance on the same assessments. This methodology would allow educators to provide early reading interventions to ELLs at risk for reading delays, as well. Using CBM to monitor ELL students reading growth has gained popularity among educators (Wiley & Deno, 2005). CBM data can be used to inform educators as to whether or not instructional programs are effectively working for ELLs. Unlike standardized assessments that may be culturally biased, using CBM with ELLs to determine reading rates of progress eliminates any

potential cultural bias. This method is a direct measure of the student's response to reading instruction and determines whether or not the instruction is effective.

The most common CBM of reading is Deno's Oral Reading Fluency measure (Fuchs, Fuchs, Hosp, & Jenkins, 2001). For this measure, students read passages, and the number of words read correctly in one minute are counted. Research shows ORF is significantly correlated with later reading comprehension scores (Fuchs, et al., 2001). Buck and Torgenson (2003) found a significant correlation between measures of ORF and state reading assessments for third grade students. ORF measures can be reliably administered to children by the middle of first grade. As a result, educators can identify students in need of early intensive reading interventions prior to the state tests. However, measures of ORF are difficult to administer for screening purposes prior to first grade. As such, ORF's use as a progress monitoring tool for readers struggling at the beginning of first grade is problematic. As a result, Good and Kaminski (2002) developed early literacy measures referred to as the Dynamic Indicators of Basic Early Literacy Skills.

Dynamic Indicators of Basic Early Literacy Skills

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) are a method of CBM designed to provide assessments of early reading skills at grade levels or ability levels in which ORF is not yet a reliable measure. DIBELS are used to measure early literacy and reading skills for children in kindergarten through sixth grade (Kaminski & Cummings, 2007). The kindergarten and first grade measures are meant represent key reading skills identified in the National Reading Panel (Good & Kaminski, 2002). According to Kaminski and Cummings (2007), DIBELS can be used to evaluate the effectiveness of interventions or as a universal screening tool. DIBELS measures are easy

to administer and produce results sensitive to small changes in reading growth. DIBELS were designed to be short probes used to monitor the effectiveness of instruction and the development of reading skills (Hintze, Ryan, & Stoner, 2003).

Similar to CBM measures of Oral Reading Fluency, DIBELS are meant to be a quick and inexpensive way to assess a student's progress in certain areas of reading. Measures are standardized in administration and scoring to ensure that each assessment is given and scored consistently for each student (Kaminski & Cummings, 2007). Like Deno's development of CBM, DIBELS are General Outcome Measures (GOM). Instead of testing a student at the end of instruction, GOM's are designed to assess the student during instruction and determine whether or not they are making progress (Kaminski & Cummings, 2007). DIBELS measures do not assess all components of reading, but do serve as a predictor of future reading performance. This is done by measuring specific pre-reading skills that are essential in order to learn to read (Hagan-Burke, Burke, & Crowder, 2006).

The DIBELS measures are broken up into pre-reading skill sets in which all children in kindergarten through third grade are tested three to four times each year. Kindergarten children complete the Initial Sound Fluency (ISF) and Phoneme Segmentation Fluency (PSF) measures. Both are intended to measure phonemic awareness. Kindergarteners also complete a Nonsense Word Fluency (NWF) measure. NWF is designed to assess the alphabetic principle, or a student's ability to identify letter sounds and blend letter sounds into words (Hagan-Burke, et al, 2006). Finally, kindergarten students also receive the Letter Naming Fluency (LNF) measure, which requires students to orally identify the names of upper and lower case letters in one

minute. This task is well supported as a predictor of potential reading problems and later reading development (Hagan-Burke et al., 2006).

During the winter benchmark of a student's first grade year, students are administered the complete Oral Reading Fluency (ORF) measures. The ORF measure requires the student to read a short passage for one minute. The number of words read correctly is tallied, and the median number of words is used based off of three passages. ORF requires the student to decode the text quickly and accurately. As discussed previously, ORF measure of reading has the strongest research backing, with a significant amount of research demonstrating a strong link between ORF and reading comprehension skills (Fuchs, et al., 2001).

The usefulness of DIBELS measures have been evaluated in a number of ways, as the reliability and validity of DIBELS have been put into question by many educators and researchers (Goodman, 2006). However, research has shown moderate to strong concurrent criterion-related validity between DIBELS measures and the Woodcock Johnson Psycho-Educational Battery (Good, Gruba, & Kaminski, 2001). The Early Childhood Research Institute on Measuring Growth and Development continues to conduct on-going research supporting the psychometric adequacy of DIBELS (Good et al., 2001).

Despite these reports, Goodman (2006) argues DIBELS is not an adequate measure of reading comprehension due to the lack of face validity. However, an extensive amount of research exists supporting the use of each DIBELS subtest to predict later reading achievement. One study examining the relationship between DIBELS measures and third grade state testing results was conducted in Ohio (Salzman, Clay,

Brown, Rosemary, & Lenhart, 2005). Salzman and colleagues administered DIBELS ORF measures to a sample of third grade students. A strong positive relationship was found between third grade DIBELS ORF measures and the student's performance on the Ohio Achievement Test in Reading. In another study, Riedel (2007) examined the ability of first grade DIBELS measures (ORF, NWF, LNF, and PSF) to predict the end of first and second grade reading comprehension with monolingual students and ELLs. While all four DIBELS measures were found to be adequate predictors of later reading comprehension, ORF was revealed to be the best predictor of first and second grade reading comprehension. This study will be examined further later in this paper.

Hintze et al. (2003) specifically examined the concurrent validity of DIBELS with the Comprehensive Test of Phonological Processing (CTOPP), which assesses phonological awareness, phonological memory, and rapid memory. This study was conducted due to the National Reading Panel (2000) report that phonological awareness is essential in acquiring the ability to read. The Hintze et al. study explored the strength of the relationship between DIBELS and CTOPP measures. Overall, results found DIBELS measures strongly correlate with most subtests of the CTOPP. Strong correlations were found between the Initial Sound Fluency and Phoneme Segmentation Fluency of DIBELS with scores designed to measure phonological awareness and memory on the CTOPP. Letter Naming Fluency also correlated strongly with subtests on the CTOPP. As a result, the author's concluded that Letter Naming Fluency was also strongly related to a learner's beginning understanding of the alphabetic principle.

DIBELS with English Language Learner's

In a review of the literature, some evidence for the use of Oral Reading Fluency measures with ELLs was evident. For example, Wiley and Deno (2005) monitored 69 third and fifth grade ELLs (80% Hmong) with ORF measures on a bi-weekly basis. Results showed ORF to be highly correlated with the Minnesota Comprehensive Assessment (MCA) test scores at third and fifth grade. Contrary to the researchers' expectations, ORF measures were a better predictor of MCA results when compared to the CBM maze measure for assessing reading comprehension. Despite support for the use of ORF with ELLs, less research exists regarding the use of DIBELS specific measures of pre-reading skills with ELLs. As stated earlier, there is a need to determine which ELLs are at risk for not performing well on high stakes tests as early as possible. Waiting until halfway through first grade or later to identify students in need of additional intervention is problematic as intervention needs to be provided as early as possible to have the greatest effect. As such, further research needs to determine the adequacy of using all DIBELS measures (LNF, PSF, NWF, ISF, and ORF) with ELLs.

Fien and colleagues (2008) evaluated the use of NWF in the early grades to screen ELLs for reading problems, using students from fourteen different school districts in which 34% of the sample was identified as ELL. The exact ethnicity of the ELL sample was not specified in the study. Five different cohorts of students made up this sample, with each cohort containing approximately 2400 participants. DIBELS NWF in the winter of kindergarten was correlated with ORF scores in the first and second grade along with scores from the Stanford Achievement Tests-10 (SAT-10). The data analysis examined the concurrent and predictive correlations between NWF, ORF, and the SAT-

10. Researchers did find support for the use of NWF with ELLs, they and concluded this measure can screen ELL students for reading problems. Specifically, strong correlations were found between NWF and ORF, with an increase in correlations when the measures were used in first and second grade. Strong within-grade correlations were also found between NWF and SAT-10. Although comparable to the results of non-ELL students, some differences were found. A majority of these differences between monolingual students and ELLs occurred during the kindergarten winter benchmark period.

Similarly, Vanderwood, Linklater, and Healy (2008) also studied the relationship between NWF and later reading performance. This study specifically examined whether or not NWF measures in first grade were related to performance on three third-grade literacy outcome measures with ELLs. A correlational analysis was completed to determine if NWF measures are related to the Stanford Achievement Test, Ninth Edition (SAT9), AIMSweb reading CBM fluency probes (R-CBM), Maze probes, and the California Achievement Test, Sixth Edition (CAT6). First grade NWF scores for ELLs, primarily from Spanish speaking homes, were found to have moderate to strong correlations with their performance on third grade R-CBM and Maze probes, and a moderate relationship with performance on the CAT6. Further predictive accuracy analyses revealed NWF measures to be 80% accurate in correctly identifying the students above the 25th percentile on all three outcome measures in third grade. When scores were below the 25th percentile on the outcome measures, NWF scores were not as accurate in predicting who would perform below the desired level. The researchers concluded NWF measures should be used in conjunction with other methods when determining which students need intensive intervention services.

Riedel (2007) briefly discussed earlier, provided the most in depth assessment of DIBELS measures in their use with ELLs. This study examined how well DIBELS subtests (e.g., PSF, NWF, ORF, and RF) administered at the beginning, middle and end of first grade predicted reading comprehension at the end of first and second grade. The Riedel sample included primarily Spanish speaking students. This study also evaluated specific characteristics of students for whom DIBELS measures were poor predictors of reading comprehension. Similar to Wiley and Deno (2005), results found stronger correlations between DIBELS ORF and reading comprehension for ELLs than for non-ELL students. Other first grade DIBELS measures (PSF and NWF) were less successful in predicting ELLs reading comprehension. Riedel (2007) concluded the use of NWF and PSF with ELLs may not be necessary as these measures do not add to the prediction of reading comprehension beyond ORF for ELLs.

Betts and colleagues (2008) completed a study examining whether not early literacy measures administered at the end of kindergarten with ELLs exhibited predictive bias on reading achievement at the end of second grade. Although this study did not examine DIBELS measures, it did consider early reading skills with ELLs. Predictive bias is an investigation of the usefulness of a predictor variable in predicting the outcome variable similarly for subgroups in a population. Using a sample of Hmong speaking and Spanish speaking students, the examiners administered the MKA, which is an early literacy measure, to kindergarten students during the spring benchmark period. The MKA is similar to DIBELS measures in that phonemic awareness, letter names, letter sounds, and reading fluency are assessed. During the spring of second grade, the sample was given the Northwest Achievement Levels Test (NALT), a standardized test of reading

achievement. Results found a moderately strong relationship between the MKA and

NALT measures for all ethnic groups (African American, Asian American, European

American, Hispanic American, and ELLs). Also, no evidence of predictive bias was

found between a group of ELLs and a group of monolingual students. The Betts and

colleagues results suggest a common regression model can be used to predict later

reading skills based upon scores from the MKA.

Critical Analysis

Extensive research has been used to develop formative measures, such as

DIBELS, to monitor student's reading progress. Educators hope to "catch" all students

who are struggling before it is too late. While research supports the use of CBM with

monolingual students for this purpose, less support exists for the use of CBM with ELLs.

Currently, limited research regarding the predictive power of DIBELS measures used in

kindergarten and first grade for later reading performance has been conducted. A lack of

research also exists involving the use of DIBELS with Hmong speaking children. If

catching all at risk learners as early as possible is the goal of educators, then more

research is needed to evaluate screening methods for kindergarten students.

Chapter III: Methodology

This chapter outlines procedures involved in evaluating the following research

questions:

1. What is the relationship between kindergarten DIBELS measures and later

performance on second grade oral reading fluency measures for ELLs?

2. Which kindergarten DIBELS measures are the best predictors of second grade

oral reading fluency for ELLs?

The selection of subjects and the sample demographics are described. The DIBELS

assessment is defined in detail followed by a description of the methodology used in the

data analysis.

Participants

The participants involved in this study include two groups of students followed

longitudinally starting in kindergarten during the 2005-2006 or 2006-2007 school year,

through second grade (i.e., the 2007-2008 or 2008-2009 school years). All participants

attended school in elementary schools located in western Wisconsin. Each school

included in the sample had a 70% or more of their student population eligible for free and

reduced lunch programs. District enrollment for the 2005-2006 school was 10,809, and

the enrollment was 10,861 in the 2006-2007 school year. Approximately 4% of the total

district population was in an ELL program (Wisconsin's Information Network for

Successful Schools, Successful School Guide Data Analyses, n.d.). All participants

included in the data analysis were enrolled in an ELL program as determined by scores

on the language proficiency measure Assessing Comprehension and Communication in

English (ACCESS) supplemented by classroom observations.

Data from 63 students was included in the final analyses for this study. Demographic data from the district's student information system was used to determine demographic characteristics of the sample. Thirty nine percent of the participants identified Hmong and English as the primary languages spoken at home. The remaining participants identified Hmong (55%), Spanish (3%), or Chinese (3%) as the primary languages spoken at home. Fifty four percent of the students were male, and 46% were female.

Materials

Dynamic Indicators of Basic Early Literacy Skills (DIBELS). Dynamic Indicators of Basic Early Literacy Skills (DIBELS) are a method of curriculum based measurement (CBM) for early literacy skills (Kaminski & Cummings, 2007). DIBELS are fluency based probes designed to assess a student's level of early literacy skills. DIBELS measures were designed to predict future reading performance by targeting the key skills needed in the process of learning how to read (Hagan-Burke, et al, 2006). The subtests included in DIBELS are designed to measures reading skills emphasized in the National Reading Panel report including phonemic awareness, phonics or alphabetic principle, reading fluency, and to a certain extent, comprehension (National Reading Panel, 2000). DIBELS benchmarks are administered three to four times a school year for the purposes of progress monitoring and screening to identify those students who are not making target benchmark goals. The assessments included in this study were the kindergarten benchmarks of Letter Naming Fluency (LNF), Initial Sound Fluency (ISF), Nonsense Word Fluency (NWF), and Phoneme Segmentation Fluency (PSF). The second grade

benchmark of Oral Reading Fluency (ORF) was also included in the analysis. These measures are described in detail below.

Letter Naming Fluency. LNF probes are used with kindergarten through the beginning of first grade students. This subtest requires the student to identify a series of upper and lower case letters arranged in random order (Kaminski & Good, 1996). The student must orally identify the names of as many letters possible in one minute. The score is calculated by the number of letters identified correctly. According to Kaminski and Good (1996), LNF is an indicator of potential future reading problems.

Initial Sound Fluency. ISF probes are used with students at the end of preschool through the middle (winter benchmark) of kindergarten. The students identify pictures that begin with specific sounds (Good & Kaminski, 2002). For example, the student may be presented with a picture of flowers, house, dog, and cup. The examiner names each of the pictures and then asks the student to point to the picture that begins with a certain sound or asks the child to identify the beginning sound in the name of a picture. This measure is used to assess a child's phonemic awareness skills. According to Good and colleagues (2004), ISF measures demonstrated moderate concurrent validity and predictive validity coefficients with the Total Reading cluster score from the Woodcock-Johnson Psycho-Educational Battery for kindergarten students. Researchers also found the ISF measures to demonstrate moderate predictive validity with CBM ORF probes for first grade students (Good, et al., 2004).

Nonsense Word Fluency. NWF probes are used with students in the middle (winter benchmark) of kindergarten through the beginning (fall benchmark) of second grade. NWF is intended to measure the alphabetic principle, a prerequisite to word

identification (Kaminski & Good, 1996). Once students understand that letters represent a sound and use sounds to form words, they are better able to decode words because the ability to decode text is a skill required prior to reading fluency and comprehension. In administering NWF, students are presented with a list of nonsense words consisting of vowel-consonant or consonant-vowel-consonant (i.e., ig, mib, dap) patterns. Students must correctly read the entire word or correctly identify each letter sound. Each correctly produced sound is scored as one point (Hagan-Burke, et al., 2006). Students are given one minute to produce as many correctly read letter sounds as possible.

Phoneme Segmentation Fluency. PSF probes are used with students in the middle (winter benchmark) of kindergarten through the end (spring benchmark) of first grade. PSF is designed to measure phonological awareness and assesses a student's ability to individually segment phonemes within an orally presented word (Kaminski & Good, 1996). For example, the examiner may ask the student, "Tell me the sounds you hear in cat," the student must isolate the sounds by responding /c/ /a/ /t/" to receive three points. Any correctly isolated segments of the word are counted as a point. Students are given one minute to correctly segment the phonemes of each word read by the examiner. PSF has been found to be an adequate predictor of later reading achievement (Kaminski & Good, 1996).

Oral Reading Fluency. ORF probes are used with students in the middle (winter benchmark) of first grade through the end (spring bench mark) of third grade. In administering ORF, students are presented with a grade level passage to read aloud. Research has found ORF to be strongly correlated with state reading comprehension exams (Riedel, 2007). Students are given the instructions, "Please read this out loud. If

you get stuck, I will tell you the word so you can keep reading. When I say 'stop' I may ask you to tell me about what you read, so do your best reading. Start here. Begin" (Good & Kaminski, 2002). After one minute of reading, the number of words read correctly is tallied. The student is asked to read a total of three passages, from which the median number of words read correctly are used as the overall ORF score.

Procedure

The DIBELS measures were administered to all participants by trained university students and district staff over several days at benchmark periods in October, February, and May. All examiners followed standardized administration procedures outlined in the DIBELS Administration Manual (Good & Kaminski, 2002). Children were called from their home classrooms to be tested in a quiet secluded area. Students completed the DIBELS measures appropriate for their grade level and benchmark period.

Data Collection

For this study, benchmark scores and demographic data for ELL students enrolled in kindergarten during either the 2005-2006 or 2006-2007 school years was matched with their benchmark scores from second grade (i.e., the 2007-2008 or 2008-2009 school year). ELL students also receiving special education services were not included in the final sample. In agreement with the Institutional Review Board for the Protection of Human Subjects, all identifying information was removed from the dataset prior to analysis. The scores were analyzed to answer the research questions regarding the relationship between kindergarten DIBELS measures and later performance on second grade ORF measures and to identify which kindergarten measures best predicted ELLs performance on later second grade ORF measures.

Data Analysis

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

questions:

Question One:

      Question one addressed the relationship between kindergarten DIBELS measures

and later performance on second grade ORF measures for ELLs. To examine the

relationship, Pearson product-moment correlation coefficients were computed between

the spring benchmark second grade Oral Reading Fluency measure and the four

kindergarten DIBELS measures, Letter Naming Fluency, Initial Sound Fluency,

Nonsense Word Fluency, and Phoneme Segmentation Fluency at the winter and spring

benchmarks. A probability value of less than, .05 and .01 was adopted to determine

statistical significance.

Question Two:

      Question two evaluated the relative contribution of each kindergarten DIBELS

measures at the winter and spring benchmarks in its prediction of second grade Oral

Reading Fluency (spring benchmark) for ELLs. Standard multiple regression analyses

were completed to evaluate the DIBELS measures ability to predict later measures of

reading fluency. Beta weights were calculated for the kindergarten benchmark measures

to determine their relative contribution of each to the prediction of second grade ORF

scores.

Chapter IV: Results

This chapter presents results regarding the predictive validity of kindergarten DIBELS benchmarks for second grade oral reading fluency with ELLs. Mean scores, standard deviations, Pearson product-moment correlations, and regression analyses were used to address the research questions presented.

Preliminary Analysis

Data Screening

The data obtained for analyses included DIBELS scores from students identified as ELL by the school district. Students who did not participate in both kindergarten and second grade at one of the elementary schools within the district where DIBELS benchmarks were completed were eliminated from the analysis. ELLs also receiving special education services were removed from the final analyses, as well. The remaining number of participants totaled 63. Not all students had scores for all benchmarks in kindergarten, resulting in varying sample sizes for each correlational analyses presented below. No significant outliers were present in the data. Preliminary analyses indicated the DIBELS measures appeared to be normally distributed for this sample of students.

Descriptive Statistics

The means, standard deviations, and numbers of participants completing each kindergarten DIBELS measure are provided in Table 1. The data includes both winter and spring benchmark periods for the kindergarten DIBELS measures. According to DIBELS benchmark goals (Good & Kaminski, 2002), the average score for this sample was within the typical ranges on the ISF, LNF, and NWF winter measures. The average PSF score for this sample was in the "some risk" range at the winter benchmark. During

the spring benchmark, the participants' average scores on LNF and PSF were in the typical range; however, the average NWF score was in the "some risk" range. The change in mean scores from winter to spring kindergarten benchmarks suggest that the sample made progress across the specific reading skills assessed over the course of the school year.

The mean, standard deviation, and number of participants completing the 2nd grade spring ORF benchmark is presented in Table 1. The average number of words read per minute for this sample was 88.31, with a standard deviation of 29.69. According to DIBELS benchmark goals (Good & Kaminski, 2002), the average ORF score was within the "some risk" range. It should be noted the benchmark goal is a score of at least 90 words per minute. The participant's mean score was very close to this goal at 88.31.

Table 1 *Means and Standard Deviations of DIBELS Benchmarks*

Winter Kindergarten Benchmark	*M*	*SD*	*n*
Letter Naming Fluency	34.18	12.37	49
Initial Sound Fluency	11.39	7.15	49
Nonsense Word Fluency	13.76	13.28	49
Phoneme Segmentation Fluency	10.69	10.29	49
DIBELS Spring Kindergarten Benchmark			
Letter Naming Fluency	40.40	13.48	52
Nonsense Word Fluency	19.87	13.89	52
Phoneme Segmentation Fluency	25.02	18.42	52
DIBELS Spring 2nd Grade Benchmark			
Oral Reading Fluency	88.31	29.69	54

Research Question One

Question one addressed the strength of the relationship between kindergarten DIBELS measures and later performance on the second grade oral reading fluency measures for ELLs. Table 2 shows the Pearson product-moment correlation coefficients between the scores. Moderate correlations existed between the second grade ORF measure and winter kindergarten benchmark measures of Letter Naming Fluency ($r = .52$) and Nonsense Word Fluency ($r = .32$) DIBELS benchmarks. These patterns of correlations suggest that the second grade ORF and the winter DIBELS measures have 27% and 10% of common shared variance, respectively. Similarly, moderate correlations existed between the second grade ORF measure and spring kindergarten benchmark measures of Letter Naming Fluency ($r = .56$), Nonsense Word Fluency ($r = .39$), and Phoneme Segmentation Fluency ($r = .38$) Each of these correlations was significant at the $p < .05$ level. These patterns of correlations suggest that the second grade ORF and the spring kindergarten measures share 31%, 15%, and 14% of common shared variance, respectively.

The remaining kindergarten DIBELS benchmarks demonstrated weaker relationships with the second grade DIBELS oral reading fluency measures. The second grade oral reading fluency measures resulted in low correlations with winter kindergarten benchmark measures of Initial Sound Fluency ($r = .11$) and Phoneme Segmentation Fluency ($r = .22$). Neither of these correlations was statistically significant.

Table 2 *Correlations Between Measures*

Kindergarten Measures 2nd Grade ORF		n
Winter Benchmark		
Letter Naming Fluency	.52*	47
Initial Sound Fluency	.11	47
Nonsense Word Fluency	.32**	47
Phoneme Segmentation Fluency	.22	47
Spring Benchmark		
Letter Naming Fluency	.56*	50
Nonsense Word Fluency	.39*	50
Phoneme Segmentation Fluency	.38*	50

*$p < .01$; **$p < .05$.

Research Question Two

The second question examined which kindergarten DIBELS measures were the best predictors of second grade oral reading fluency for ELLs. Table 3 shows the regression coefficients. Given the non-significant correlation with ORF, ISF was not included in the regression analyses of winter benchmark scores. The results in Table 3 show the amount of ORF variance predicted by PSF, LNF, and NWF from winter to spring is similar. The value of R^2 suggests that the combined kindergarten measures account for about 26% of the variance on the second grade ORF measures.

Table 3 *Regression Analysis*

Benchmark Period	R	R^2	F	df	Sig. F
Winter Kindergarten	.52	.27	5.6	3	.002
Spring Kindergarten	.52	.26	5.6	3	.002

The individual beta weights for each predictor are included in Table 4. Inspection of the beta weights allow for an analysis of the relative contribution of each kindergarten DIBELS measure in predicting 2nd grade ORF. Findings indicate LNF was the only variable resulting in a statistically significant beta weight. The results suggest the two measures of PSF and NWF do not add anything to the prediction of second grade ORF beyond LNF. This finding is contrary to previous research and will be discussed further in chapter five.

Table 4 *Beta Weights*

DIBELS	K-Winter	K-Spring
PSF	.059	.018
LNF	.425*	.421*
NWF	.131	.126

*$p<.001$, N=47 (winter), N=50 (spring)

Chapter V: Discussion

Public schools are now being pressured to demonstrate adequate yearly progress in the area of reading for all students. This pressure has caused a need for early identification and intervention with children who are at risk for reading failure. Specifically, ELLs have become a high priority of educators due to the influx of children not proficient in their use of English and their unique set of learning needs in the process of learning to read. Various assessment tools have been developed to help educators identify students who are not making adequate progress in the area of reading. CBM has been offered as an assessment tool that is less impacted by linguistic and cultural differences (Wiley & Deno, 2005). One method of CBM, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), was designed to provide an assessment of literacy skills in early grades, or prior to the age range with which Oral Reading Fluency measures are appropriate.

Through an examination of the literature, it became clear a lack of research was available regarding the utility of early DIBELS measures with ELLs. Specifically, very few studies have addressed the use of DIBELS measures with ELLs to predict their later reading performance. Deno and colleagues (2001) determined that ORF is an adequate progress monitoring tool for ELLs; however, very few studies examining the early DIBELS measures have been completed (Fien, et al., 2008). Fien and colleagues did find support for the utility of kindergarten NWF in predicting later reading fluency with ELLs. Nevertheless, this study did not examine all early DIBELS measures (i.e., LNF, PSF, ISF, and NWF) commonly used as screening tools in kindergarten. The current study evaluated the relationship between all kindergarten DIBELS measures and later

performance on second grade ORF measures for ELLs. An analysis was also completed

to determine which kindergarten DIBELS measures were the best predictors of second

grade ORF for ELLs. This chapter will discuss the findings and limitations of the current

study. The implications for practitioners and for future research will also be discussed.

Research Question One

Question one addressed the relationship between kindergarten DIBELS measures

and later performance on second grade ORF measures for ELLs. The strongest

correlations were found between DIBELS second grade ORF measures and LNF (winter

and spring benchmarks). This is similar to previous research with non-ELL students in

which LNF was highly correlated with assessments measuring word reading fluency

(Hagan-Burke et al., 2006). Results from the present study indicate kindergarten LNF

measures predict second grade ORF performance with ELLs.

NWF demonstrated a moderate relationship with end of second grade measures of

ORF. Though in the moderate range, the size of the relationship between NWF and ORF

measures was surprising given previous research indicates a stronger relationship

between NWF and ORF (Fien, et al., 2008; Vanderwood et al., 2008). NWF measures

were able to correctly identify 80% of ELLs who scored above the 25th percentile

(Vanderwood et al., 2008). Given these findings, a stronger relationship was expected in

the current study.

It is possible that the predictive relationship of NWF with reading fluency grows

stronger as children have had more explicit reading instruction. Fien and colleagues

(2008) did find that the largest correlational difference between ELLs and monolingual

students was during the winter benchmark of kindergarten. These findings were similar to

the findings of this study, supporting the notion that this relationship may vary with the benchmark period and grade level.

A weak correlation was also found between ELLs performance on the winter benchmark PSF and second grade ORF; however, this relationship became stronger during the spring benchmark period. This finding is surprising since the National Reading Panel (2000) identified phonemic awareness as one of the essential reading components. In fact, phonemic awareness is at the heart of reading instruction in many U.S. schools. However, research regarding the utility of PSF as a predictor of later reading with non-ELLs has been mixed, as well. Hagan-Burke and colleagues (2006) found first grade PSF to be moderately correlated with a later word reading fluency assessment. This finding was surprising due to reports of a clear link existing between the understanding of phonemic awareness and reading success (Bradley & Bryant, 1985).

Similar to the NWF findings, when the average PSF measure was in the "some risk" range, the strength of the relationship with ORF was weaker. While phonemic awareness and knowledge of alphabetic principle are important in the process of learning to read, perhaps the specific skills measured by the DIBELS task develop differently for ELLs. Different rates of development in early grades may have less of an impact on later reading fluency, therefore impacting the relationship between kindergarten and first grade benchmarks and later reading performance.

In the current study, ISF was not significantly related to later reading performance. The size of the correlation with this benchmark and ORF in second grade was small and insignificant. While phonological awareness skills are important precursors to reading success, the DIBELS ISF task does not appear to predict later

reading fluency. This finding is contrary to evidence provided in the DIBELS manual linking a moderate to strong correlation with spring first grade CBM ORF (Good & Kaminski, 2002). However, it should be noted that Good and Kaminski's study did not include an analysis with ELLs. The authors suggest that ISF is best used from pre-school to mid-kindergarten. For this task, students are asked to select which picture has the beginning sound that the administrator is reading. Perhaps weaknesses in English vocabulary differentially affect kindergarten ELLs performance on this task at school entry, but the same weaknesses had less of an impact on oral reading fluency after several years of instruction. Overall, practitioners should be aware of the differences in correlations between kindergarten DIBELS measures and later reading performance.

The cut score established for the NWF winter benchmark is at least a score of 13. The overall mean for the participants on the NWF winter benchmark was 13.76, placing their performance in the "low risk" category. However, the sample's average score was in the "some risk" range at the spring benchmark, suggesting a lower rate of progress with this skill. Fien and colleagues (2008) also found similar progress rates in their study using DIBELS with ELLs. In fact, the winter and spring NWF benchmark means for the participants in the Fien study placed them in the "some risk" range. The similarities in findings suggest ELLs may have a different rate of progress compared to non-ELLs. In addition, the current study consisted of largely Hmong speaking students, which also may have factored into the results, as the sounds of the Hmong language are significantly different from English. Fien and colleagues did not specify the different languages spoken by the students included in their study.

Research Question Two

The second research question evaluated which kindergarten DIBELS measures were the best predictors of second grade ORF for ELLs. Regression analysis suggests that the predictive relationship between PSF, LNF, and NWF at the end of second grade ORF was similar from winter to spring. When considered together, LNF was the best predictor of the end of second grade ORF. In fact, findings suggest that PSF and NWF do not add anything to the prediction of second grade ORF beyond LNF. Hagan-Burke, et al. (2006) also found LNF to be the best predictor of later reading for English only speaking students. The researchers concluded that students who have more interaction with language and exposure to print may be more likely to have strong skills in letter naming. Perhaps the same is true for ELLs, indicating early exposure to language and print may have a lasting impact on their reading skill.

However, unlike research with monolinguals, the DIBELS NWF measure did not add to the prediction of ORF in second grade beyond the contributions of LNF at either benchmark period. The current finding is unique in that previous research with ELLs reported a stronger relationship between NWF and later reading performance (Vanderwood, et al, 2008; Fien et al., 2008). The current study suggests that the ability to read nonsense words in kindergarten is not strongly predictive of an ELLs reading fluency in later grades. Though stronger in size than the current study, Fien and colleagues (2008) did find weaker correlations between the NWF winter kindergarten benchmark and later measures of ORF. Researchers attributed the results to the fact that ELLs have to learn that letters represent sounds, and the relationship between letter sounds may be different depending on the ELLs home language (Fien et al., 2008). It

may be that the NWF task is difficult or confusing for ELLs early on, but with adequate instruction and exposure to print, the task can become more comfortable for this population of students.

The size of the correlation between NWF and second grade ORF did grow stronger between winter and spring benchmarks ($r = .32$, $r = .39$, respectively), as was true for all of the measures administered at both benchmark periods. Perhaps as ELLs receive more instruction, their performance on DIBELS measures allow for stronger predictions of later reading ability. Nonetheless, practitioners should use caution when interpreting kindergarten benchmark results of NWF, PSF, and ISF measures with the ELL population. In this sample of primarily Hmong speaking ELLs, measures of letter knowledge and fluency in letter naming provided the best prediction of later reading skill in second grade.

Further Implications

DIBELS measures are a well researched tool used as a form of Curriculum-Based Measurement. However, research on DIBELS has mainly focused on English only speaking students. Of the existing studies on the use of DIBELS with ELLs, the focus has primarily evaluated DIBELS assessments completed in first through third grade. A lack of research existed regarding the correlations between kindergarten DIBELS measures and later reading skills.

In this study, LNF was found to be the strongest predictor of later second grade ORF performance. The remaining DIBELS measures demonstrated weaker relationships with end of second grade oral reading fluency. When using the DIBELS assessment and interpreting the results, practitioners need to consider the population of students.

Although a breadth of research exists for the value of DIBELS measures in the early

identification of reading difficulties for monolingual students, the results of DIBELS

assessments with ELLs may need to be interpreted differently by practitioners. More

importantly, practitioners need to consider a wide variety of information when making

early intervention decisions.

While there were some moderate correlations between kindergarten early

DIBELS measures and second grade ORF, there remain some questions regarding the

low correlation between the winter benchmarks (ISF and PSF) and ORF. These two

subtests measure a students understanding of phonemic awareness, identified as essential

components to reading success. However, the utility of these early measures may be

different for ELLs until they are exposed to the kindergarten curriculum. Perhaps ELLs

should not be screened until 1st grade when they have received instruction in the areas of

phonological awareness, phonics, and vocabulary.

It is also valuable to keep in mind that ELLs are not a homogenous group of

students. This population of students may come to school with varying levels of English

proficiency, different languages and cultural backgrounds, different literacy exposure,

and parents who may or may not be proficient in English. All of these factors need to be

taken into consideration when assessing an ELLs reading skills and determining an

appropriate instructional method. These factors should also be considered in research

similar to this study, which will be discussed in the next section

The current sample was unique in that it included primarily Hmong speaking

students. The Hmong language is different from the English language in that is a not

based upon the alphabetic writing system. Previous research with ELLs consisted largely

of Spanish speaking students. Like English, the Spanish language is also alphabetic in nature. The Hmong language is different in that it is a tonal language. Hmong words contain one of seven tones. Each word has a tone attached to it that changes the meaning of the word. For example, a word used with a high tone, mid tone, or low tone is considered to have three different meanings (The Cultural Orientation Project, 2004). According to The Cultural Orientation Project, Hmong students are thought to also have difficulty with consonants and the inflectional system within the English language. These differences in language structure may cause Hmong student's performance to vary on early measures of literacy development that emphasize phonemic awareness

Limitations

Although the current study adds to the research on the early identification of ELLs at risk for potential reading problems and the use of DIBELS, a number of limitations are present. First, the study only included ELLs from a select area in western Wisconsin. To generalize the findings, additional research including a broader geographical location with students speaking a variety of languages and from varying socio-economic status may be valuable. This study did not consider the level of language proficiency in any of the analyses; therefore, students of varying levels of English proficiency were included in the analysis. Finally, the assumption was made that each DIBELS measure was administered according to standardization rules; however, this study used archival data which meant forfeiting a lack of control.

Future Research

The DIBELS assessment tool has little research supporting the predictive validity of ELLs performance on early measures with later oral reading fluency. When compared

to the few published studies in this area, findings with regard to the use of measures like DIBELS with ELLs appear diverse. Specifically, measures assessing the alphabetic principle (i.e., NWF) have produced mixed results. Previous research found NWF to be an accurate predictor of later reading ability (Fien, et al., 2008; Vanderwood et al., 2008). However, similar to the results of this study, winter kindergarten NWF benchmarks were found to have weaker correlations with ORF measures (Fien, et al., 2008). The nature of why weaker correlations were found in early kindergarten should be explored. In general, more research is needed to further identify variables that may be related to ELLs performance on these types of early literacy measures.

A weak correlation was also found between ELLs performance on the winter benchmark PSF and second grade ORF. This relationship became stronger during the spring benchmark period. The National Reading Panel identified phonemic awareness as an essential reading component and is needed for reading success. However, research creating a link between PSF and later ORF measures are weak with even non-ELLs (Hagan-Burke, 2006). The utility of PSF measures with ELLs should be explored. It is possible that ELLs learn beginning literacy skills differently than non-ELLs. Their rates of progress and strategies for literacy success should be considered.

This sample largely consisted of one ethnic group, which may be cause to complete a comparative analysis by language spoken. Much of the research completed with ELLs has consisted largely of Spanish speaking students. The current study was comprised mainly of Hmong speaking students. An analysis to determine if differences exist in the predictive validity across home languages would be beneficial. This would determine whether or not children with first languages not based on an alphabetic writing

system (i.e., Hmong) perform differently on measures relative to children with first languages that are alphabetic in nature.

This study also did not consider the level of language proficiency of the participants. The level of exposure to the English language may be a determining factor in how quickly ELLs pick up on the essential components for reading success. Future research should consider including an analysis on the level of language proficiency and its effect on a student's DIBELS performance. Students who have not yet developed Basic Interpersonal Communication Skills in English may be focusing on vocabulary development and letter knowledge in kindergarten such that instructional in phonological awareness and alphabetic principle is less emphasized. Further investigation into the utility of these early measures with ELLs may be beneficial. This would determine the appropriateness of kindergarten screening measures and how much weight can be placed on the results.

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