The Relationship between DIBELS Scores and Reading Comprehension Grades in First Grade

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ABSTRACT

The purpose of this study was to examine the relationship between scores on a commonly used reading screening test (the Dynamic Indicators of Basic Early Literacy Skills, or DIBELS) and reading comprehension grades of first grade students. The concurrent and predictive relationships between DIBELS scores and comprehension grades (based on percentage scores of Treasures First Grade Weekly Assessments) were examined using fall and spring assessment (DIBELS) data and grades. These relationships were of interest because DIBELS scores are used to form small reading groups, which are a source of intense comprehension instruction. Even though DIBELS subtests do not assess comprehension directly, they have an effect on comprehension skills because of the placement of students in these groups. Different groups receive different types of comprehension instruction based in part on DIBELS scores, so understanding the relationship between DIBELS scores and comprehension could help inform instruction and ensure interventions are appropriate.

No statistically significant correlations were found between fall and spring DIBELS scores and reading comprehension scores. The only significant correlations found were those between two DIBELS subtest scores (Correct Letter Sounds and Whole Words Read). While this study showed limited correlations between DIBELS and comprehension grades, other studies have suggested DIBELS has satisfactory validity and reliability. Overall, the results supported the conclusion that teachers should use caution and consider data in addition to DIBELS results when making instructional decisions.

CHAPTER I

INTRODUCTION

The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) is an assessment commonly used in first grade to determine reading levels and the need for intervention to remediate and increase literacy skills. The skills assessed through DIBELS focus on phonemic awareness and phonics and are important for early reading. In general, these early reading skills are considered important precursors for reading comprehension. Without a solid foundation, reading comprehension may be difficult for students. The DIBELS subtests assess various early learning skills but do not test reading comprehension directly. Since reading comprehension is the ultimate goal of reading, it is important to determine the correlation between DIBELS subtest scores and reading comprehension. If this correlation is significant, it suggests that there is a relationship between the skills on DIBELS, which impact placement and intervention and reflect the foundations of reading comprehension. It is the goal of the researcher to determine whether DIBELS and reading comprehension scores correlate significantly at various intervals in first grade.

Overview

In order to have a successful life, one must be able to read. Reading is a lifelong skill that begins to develop in the first years of life and never stops. It is essential for almost every profession, hobby, or task. In the early elementary years, students begin to develop skills such as phonemic awareness and phonics. These skills provide a strong base that is essential for all other aspects of reading. The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) contains a series of subtests that evaluate a student's proficiency with different literacy skills which underpin comprehension: initially, first sound fluency, letter naming fluency, phoneme

segmentation fluency, and nonsense word fluency in kindergarten, then letter naming fluency, phoneme segmentation fluency, nonsense word fluency, and oral reading fluency in first grade, and finally nonsense word fluency and oral reading fluency in second grade. These subtests are believed to be successful indicators of future reading success. This is especially true in the area of comprehension, which is the overall purpose of reading.

In many elementary schools, fall DIBELS scores are used to place students into skill level groups within the classroom. Many formal, pull-out intervention groups are also formed using DIBELS data. Therefore, it is important to determine if there is a correlation between the fall DIBELS subtests and future reading comprehension. Because first grade is a year in which extraordinary gains in reading are often attained, it is of interest whether this correlation does truly exist to understand how reading-related assessment data (DIBELS) relate to reading comprehension outcomes.

Statement of the Problem

The purpose of this study is to see if significant correlations exist between DIBELS scores and comprehension grades at various intervals in first grade. In many schools, DIBELS scores are one of the few assessments used to form ability-based reading instruction groups. However, the main focus of DIBELS is not comprehension - the ostensible goal of reading instruction- but phonemic awareness and phonics. Important decisions, such as those concerned with ability-based groupings, are based on DIBELS scores, and these decisions have the aim of improving reading comprehension. Therefore, it is imperative that there is a relationship between the DIBELS and comprehension scores during fall and spring grading/testing intervals.

Hypothesis

For this study, the researcher believed that there would be no significant correlation between DIBELS subtest scores and reading comprehension grades.

To determine if DIBELS scores relate significantly to reading comprehension levels, scores on two versions of DIBELS subtests, those administered in fall and spring, were correlated with reading comprehension grades to determine if any of the concurrent or predictive relationships were statistically significant. The null hypotheses to be tested follow:

Concurrent relationships between DIBELS and Reading Comprehension

Fall Data

ho_{1a}: r (fall DIBELS:CLS)(1st period Rdg comprehension grade) $= 0$

ho_2: r (fall DIBELS:WWR)(1st period Rdg comprehension grade) $= 0$

$ho3$: r (fall DIBELS: LN)(1st period Rdg comprehension grade) $= 0$

$ho4$: r (fall DIBELS: PSF)(1st period Rdg comprehension grade) $= 0$

Spring Data

ho_5: r (spring DIBELS:CLS))(final period Rdg comprehension grade) $= 0$

$ho6$: r (spring DIBELS:WWR))(final period Rdg comprehension grade) $= 0$

$ho7$: r (spring DIBELS:ORF)(final period Rdg comprehension grade) $= 0$

Predictive relationships between DIBELS and Reading Comprehension

Finally, and acknowledging the fact that fall DIBELS scores may have influenced interventions offered, or not offered, to the sample, DIBELS scores from the fall were correlated with end of year reading comprehension scores to determine if the initial assessments were

predictive of end of year outcomes for reading comprehension. The null hypotheses to be tested follow:

$$Ho8: r_{\text{(fall DIBELS:CLS)(final period Rdg comprehension grade)}} = 0$$

$$Ho9: r_{\text{(fall DIBELS:WWR)(final period Rdg comprehension grade)}} = 0$$

$$ho7: r_{\text{(fall DIBELS: LN)(final period Rdg comprehension grade)}} = 0$$

$$ho8: r_{\text{(fall DIBELS: PSF)(final period Rdg comprehension grade)}} = 0$$

Operational Definitions

This study had two significant variables which were correlated: scores on DIBELS subtests, including Nonsense Word Fluency and Oral Reading Fluency, and scores on Treasures Weekly Assessments of Comprehension.

DIBELS Subtests

Letter Naming Fluency

In this subtest, each student is tested for one minute. The student is shown a sheet with a random assortment of letters, both upper- and lower-case, arranged in horizontal rows. The student is instructed to say the name of each letter. The timer is started, and the student names as many letters as possible in one minute. The teacher records responses in the DIBELS booklet.

Phoneme Segmentation Fluency

Each student is tested for one minute. The student is instructed to listen to a word said by the teacher, and then say the sounds they hear in the word. For example, if the teacher says "cat," the student should say "/c/ /a/ /t/." The timer is started, the teacher says a word, and the student says the sounds in each word. This continues for one minute. The teacher records the student's responses in the DIBELS booklet.

Nonsense Word Fluency

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There are two separate scores in the NWF subtest: Correct Letter Sounds (CLS) and Whole Words Read (WWR). In the NWF subtest, students are tested for one minute. They are shown a number of nonsense words, such as "gom," "vef," and "kib." The students are encouraged to read the whole word if possible, and if not, they are instructed to sound out the word in order to read it. The CLS score counts how many correct letter sounds they were able to say in the one minute time span. The WWR score counts how many whole words were read without having to sound out the word first in the one-minute time-span.

Oral Reading Fluency

In the ORF subtest, students are given an on-grade level reading passage. They are instructed to read the passage aloud to the best of their abilities for one minute. The score for ORF is CWPM (correct words per minute; how many words were read correctly in a one minute oral reading).

Some teachers also administer the retelling portion of the ORF subtest, and this score is based on a four-point scale describing how well the student was able to retell the part of the passage they read. This subtest was administered to the first grade class in order to determine how well they retold a passage. This subtest was not included in this study, however, mainly as it is very subjective and can be scored differently by different test administrators. Also, if the student did not have time read a significant portion of the passage, he or she would not have enough knowledge gained from the reading to retell it accurately.

Treasures Weekly Assessments – Comprehension Scores

Treasures is the reading curriculum that is used in Anne Arundel County Public Schools (MacMillan McGraw-Hill, 2011). At the end of each week of instruction, there is a weekly assessment. This assessment focuses on many different aspects of reading, such as high

frequency words, phonemic awareness, phonics, comprehension, structural analysis, vocabulary, and grammar. For the purpose of this study, only the comprehension score on the Weekly Assessment was used as a measure of understanding passages. The comprehension scores correlated with fall and spring DIBELS scores were the end of marking period percentage, or the average of all of the weekly assessments from the first and final marking periods.

CHAPTER II

REVIEW OF THE LITERATURE

There are few things in life that are more important than learning to read. Reading is a lifelong skill needed for almost every aspect of life. It is the responsibility of educators to make sure they successfully teach students how to read and comprehend so they become lifelong learners and successful adults. Before being able to read, however, young children must have a grasp on beginning literacy skills, including phonemic awareness and the alphabetic principle of phonics. In order to deliver tailored instruction for each child's needs, teachers must be aware of the strengths and weaknesses of each child. Because of this aspect, reading assessments are paramount. Reading assessments give teachers the information they need to guide instruction and help students improve in areas in which they struggle. One such assessment in the primary grades is the Dynamic Indicators of Basic Early Literacy Skills, or DIBELS. DIBELS is a reading assessment that is widely used in the United States and guides instruction and the ability grouping of students. Although this assessment focuses on early literacy skills, all teachers teach with the goal of comprehension in mind. Since comprehension is the ultimate goal in all reading tasks, this literature review will examine the research that exists regarding whether or not DIBELS assessment scores are correlated to future comprehension scores.

A Brief History of Reading Instruction

In the past century of American history, there have been two models of reading instruction that have been the focus of educators. These include the child-centered model and the skills-based model (Fisher, Lapp, & Frey, 2011c). Advocates of the child-centered model which started gaining popularity in the 1950s and 1960s through the work of John Dewey, "strongly recommend that a child's early education be natural; this means avoiding contrived

instruction and instead allowing children to learn through their own interest and curiosity"
(Fisher et al., 2011c). This model allows the curriculum to be "built around the interests of
children" (Fisher et al., 2011c p.2). For example, if students are interested in space, then they
are taught about space. If students are interested in the rainforest, then they are taught about the
rainforest. No standardized curriculum is taught, and curricula differ from year to year. Jean
Piaget, another influential educational researcher, also believed that "young children should use
their curiosity and spontaneity to learn" (Fisher et al., 2011c, p. 2). Child-centered models also
argue that "children learn best through play and in real-life settings" (Fisher et al., 2011c p.2).
Many social skills develop naturally because students are engaged in play in which they have to
learn these skills to get along with their peers. Children are also engaged in learning centers,
where "children experiment with the materials there. For example, a science center might have a
water-play table, plants, and magnets. The math center could have a scale, tactile numbers, and
counting rods. Each learning center that the child visits revolves around their areas of interest
such as outer space or rainforests.

In the mid 1960s, educational researcher Marie Clay gained popularity in America with
her emergent literacy views. Clay believed that "the child acquires some knowledge about
language, reading, and writing before coming to school" (Fisher et al., 2011c, p. 2). She argued
that literacy develops from the beginning of life in the home setting, and that parents play an
important role in this development. This perspective also "accepts children at any level of
literacy they are functioning and provides a program for instruction based on individual needs"
(Fisher et al., 2011c, p. 2). Although this is still a child-centered approach, it ties in social
constructivist influences and places more "emphasis on problem solving than on direct
instruction of skills" (Fisher et al., 2011c, p. 2). Children remain at the center of instruction, but

teachers realize that play and play alone may not develop all of the reading skills necessary for students to be successful adults.

By the 1970s, educational researchers' viewpoints were beginning to shift again. It was becoming evident that children needed to be taught specific skills in order to be successful readers. Skills-based models would be the result of this idea. "Instead of waiting for a child's natural maturation to unfold, educators focused on nurturing that maturation through instruction with a set of skills identified as prerequisites for learning" (Fisher et al., 2011c, p. 3). The shift of viewpoints was moving away from natural maturation through play and the child's interests, to the acquisition of skills taught "systematically on the assumption that all children are at a similar level of development when they come to preschool or kindergarten" (Fisher et al., 2011c, p. 3). Children learn beginning reading skills through "an organized program presented in a systematic and direct manner...requiring direct instruction, time on task, structure, routines, and practice" (Fisher et al., 2011c, p.3). This helps students learn each skill they need to be successful readers and build upon this skill set with each new skill learned.

This approach continued to gain popularity through the late 20th century, and "by the turn of the 21st century, the explicit teaching approach...was bolstered by research dealing with phonics and phonological awareness" (Fisher et al., 2011c, p. 4). Eventually, through further research, the National Reading Panel recognized five areas of reading as the most crucial for literacy development: phonemic awareness, phonics, vocabulary, comprehension, and fluency. . Through this acknowledgement, "the federal government called for states to create rigorous standards for literacy development" (Fisher et al., 2011c, p. 4). Teaching young students today requires a strict adherence to these standards, proof that the children have mastered these standards, assessments that are linked to these standards, and multiple opportunities for children

to learn these skills and practice them as much as possible. The focus of reading education has undergone many changes throughout history, but all changes are based on what researchers believe to be in the best interest of America's children.

Components of Beginning Reading

Beginning reading skills are unlike most other general reading skills. They require a deep knowledge of words and letters and how they connect to form words and sentences. It is imperative that students have strong beginning reading skills in order to be successful with later reading skills. Beginning reading skills include phonemic awareness and phonics as well as the mastery of these skills.

Phonemic Awareness

"Phonemic awareness (PA) instruction teaches students to manipulate the smallest sounds or *phonemes* in spoken words, for example segmenting and pronouncing the four phonemes in "s-t-o-p" (Fisher, Lapp & Frey, 2011d, page 1). As stated by Fisher et al. (2011d):

> Phonemic awareness is important to teach, especially to beginners. Children are accustomed to paying attention to meanings in speech, not to phonemes. Separate phonemes are hard to distinguish because speech is continuous with phonemes folded together seamlessly. Learning to read in English requires PA because students must learn to form connections between phonemes and the letters that symbolize them, called graphemes, in order to decode words, to spell words, and to build a vocabulary of words thy can read from memory by sight. (p. 1)

At the point that students are becoming phonemically aware, they may not be able to read yet. This development is key, as students need to be able to recognize the sounds in words so they are able to read and write new words successfully and independently. All future reading skills will build on the skill of phonemic awareness.

Phonics

After students develop phonemic awareness, instruction then moves into the area of

phonics. Simply put, phonics is attaching letters to the sounds that students already know. As

stated by Fisher et al. (2011d), "the term 'phonics' is used in two ways: to refer to reading

instruction that systematically teachers letter-sound relations and their use to read words, and to

refer to the letter-sound knowledge and skills that are taught" (p. 1). In a systematic phonics

program, phonics instruction may begin slowly at first, starting with one sound and attaching a

letter to that sound (i.e., /s/ is spelled with an s, /m/ is spelled with an m). Instruction eventually

gains steam as students become more accustomed to the association of graphemes to phonemes.

It also becomes more complex as it involves short and long vowel patterns, consonant blends,

digraphs, and diphthongs. As students gain phonetic knowledge, they are able to practice by

"reading decodable texts, performing word study activities, and learning the spellings of words"

(Fisher et al., 2011d, page 1). It is amazing the amount of knowledge young students gain by a

systematic phonics program.

Comprehension

Reading comprehension is the overall goal of reading. Whether one is reading a novel, a

newspaper or magazine article, a textbook, directions, or an ingredient statement on a pack of

cookies, everyone wants and needs to understand what they read. The skills of phonemic

awareness and phonics will eventually lead young readers to the skill of comprehension. In

order to comprehend, "competent readers actively construct meaning through an integrative

process in which they interact and transact with the words on the page, integrating new

information with pre-existing knowledge structures" (Fisher, Lapp, & Frey, 2011b, p. 1).

Comprehension is a very complex process and does not come easily to many students. There are

numerous things that must happen all at once in order for comprehension to occur. Some, but

not all, of the processes that occur include "the weighing of each of many elements in a sentence,

their organization in the proper relations to one another, the selection of certain connotations and the rejections of others, and the cooperation of many forces to produce the final response" (Fisher et al., 2011b, p. 1). Students must also have a robust vocabulary, the knowledge of complex sentence structures, prior knowledge of a subject, and a certain amount of reading fluency for the text to be easily comprehensible. A breakdown in any of these components will result in difficulties for the student. Teachers must teach each of these components to students to make sure that they are successful with any kind of text that they may encounter.

Development of Reading Components in Primary Grades

"Children's literacy development during the elementary school years is the foundation for their academic success and, to an extent, their life success in later years" (Fisher Lapp, & Frey, 2011e, p. 1). From this statement, it is easy to see that teachers of reading have an extremely important job on their hands. The elementary school years are some of the most important years in a child's life, because this is where they will learn to read and where the foundations of comprehension are taught. Parents have an important job as well, since true literacy begins even before children step foot into school buildings. "Children come to school able to understand and respond to thousands of spoken words, but their ability to recognize words in print relates to their preschool activities with written language" (Fisher et al., 2011e, p. 2). Students who have attended preschool may be able to read or write their name, and may be able to recognize other environmental words, such as labels in a classroom labeling things like *book*, *desk,* and *teacher*. Those who have not attended preschool may not have these abilities. Children's reading abilities develop as they move through different stages.

Fisher et al. (2011e) describe early reading as a series of stages as follows:

In the schema emphasis phase stage, children exhibit reading-like behavior, turning pages and

"reading" from prior knowledge of story and picture clues. In the semantic/syntactic emphasis phase, which is like the phonemic or invented spelling stage in writing, they continue to use schematic knowledge and picture clues but begin to read some words in context. Miscues at this stage are likely to fit the context semantically and syntactically but may not reflect the actual words on the page, for example "bird" for "canary." Researchers found developmental progressions as children rely on grapho-phonemic cueing systems, engage in quasi-reading, and eventually engage in independent reading. (p. 2)

Children do not come to school and automatically learn to read. They progress through a series of stages before it is an independent process for them. Pullen, Lane, Lloyd, Nowak, & Ryals, (2005) state that "phonological awareness instruction significantly improved the students' reading skills, including word reading, phoneme blending, and segmenting" (p. 64). The stage in which students learn phonological awareness comes even before phonemic awareness, and it is important that teachers guide students through this stage. Once students are phonologically and phonemically aware, we begin to associate letters with sounds as they transition into learning phonics, or the alphabetic principle. Pullen et al. (2005) agree that "for a child learning to read an alphabetic language such as English, understanding of the alphabetic principle - the fundamental insight that letters and sounds work together in systematic ways to form words - is essential" (p. 64). It is very important that teachers foster each one of these stages in order to help children progress and reach their potential as readers. If we fail to foster this growth, then we are setting children up for failure because "recent reading research provides compelling evidence that children who start off poorly in reading typically remain deficient readers throughout their schooling and beyond" (Pullen et al., 2005, p. 64). Deficient readers are not the goal of education, and it is up to educators to make sure that this does not happen.

Overview of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS)

In order for teachers to be able to provide differentiated instruction for children, it is important that educators gain insight into the levels of students. One reading assessment that provides instructors with this information is the Dynamic Indicators of Basic Early Literacy Skills, or DIBELS. "DIBELS encompasses a set of brief standardized measures for students in the primary grades (K-3)...and was developed to assess three of the key early literacy domains (phonological awareness, alphabetic understanding, and fluency)" (Goffreda & DiPerna, 2010, p. 464). DIBELS contains different subtests based on which grade is being assessed. The focus of this section will be the Letter Naming Fluency, Phoneme Segmentation Fluency, Nonsense Word Fluency, and Oral Reading Fluency subtests.

Letter Naming Fluency

The first subtest given to first grade students in the fall is Letter Naming Fluency (LNF). Goffreda et al., (2010) describe LNF:

> LNF is used to assess knowledge of the alphabetic letters in kindergarten, as well as in the fall of Grade 1. The student is presented with a page of upper- and lowercase letters, and verbally names as many as possible. The student's score is the total number of correct letters named within 1 minute. (p. 464)

Phoneme Segmentation Fluency

The second subtest given to first grade students is Phoneme Segmentation Fluency (PSF). This subtest is administered in the fall. Goffreda et al., (2010) describe PSF:

> PSF is used as an applied measure of phonemic awareness skills...The examiner orally presents a monosyllabic word (e.g., "cat"), which the student must segment into individual phonemes (e.g., "/c/ /a/ /t/"). The total score is the total number of correct

phonemes produced within 1 minute. (p.464)

Nonsense Word Fluency

The third subtest given to first grade students is Nonsense Word Fluency (NWF). This subtest is given in the fall, winter, and spring quarters. Goffreda et al., (2010) describe NWF:

NWF is used to measure the alphabetic principle, including alphabetic understanding and phonological recording...The student is presented with a sheet of simple vowel-consonant and consonant-vowel-consonant nonsense word sequences (e.g., "tob," "rup," "kud," etc.) and may either pronounce individual letter sounds or the entire word. (p. 465)

The score for the NWF subtest is separated into two scores: Correct Letter Sounds (CLS) and Whole Words Read (WWR). The CLS score determines how many correct letter sounds the student was able to identify, and the WWR score determines how many whole words the student was able to read without first sounding out the word.

Oral Reading Fluency

Oral Reading Fluency (ORF) is the fourth subtest given to first grade students. It is given in the winter and spring. Goffreda et al., (2010) describe ORF:

ORF is used to assess a child's fluency in reading connected text...Students read standardized grade-appropriate passages aloud to the examiner. The score, or ORF rate, is the number of words read correctly per minute. (p. 465)

Validity and Reliability of DIBELS

There are numerous studies that have evaluated the validity and reliability of DIBELS. Nelson's (2008) troubling evaluation of DIBELS describe "the technical adequacy of early reading measures as both disturbing and sobering," (p. 542), and that "no reading instruments met all evaluation criteria" (p. 542) based on the focus of this study. Although much of the

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research provides data that is just as troubling, millions of students continue to be assessed using DIBELS. Nelson (2008) did conclude that evaluations of DIBELS have "indicated acceptable levels of reliability measures, including test-retest, alternate forms, and inter-rater" (p. 543). DIBELS is generally a test that is better at predicting at-risk students than students at the other end of the continuum. Nelson's (2008) research found that "DIBELS showed greater negative predictive power than positive predictive power. Negative predictive power was over 80% for all DIBELS tasks and often over 90%. None of the DIBELS tasks demonstrated positive predictive power at the level regarded as acceptable for screening measures" (page 548). Goffreda et al.,(2010) feel as though "future research is necessary to strengthen the reliability and validity evidence base for at least four of the five DIBELS indicators" (page 480). These authors (2010) also warn educators that the "stability of scores for PSF and NWF is promising for progress monitoring and screening purposes. However, lack of convergent validity and low levels of concurrent and predictive validity potentially limit the utility of scores from these measures" (page 481). Goffreda et al., (2010) say it best when they state: "Although the extant reliability and validity evidence of DIBELS scores for single-point decisions is promising, there are several psychometric gaps that remain to be addressed...Finally, the limited ability of Grade 1 early literacy indicators to predict future academic achievement beyond ORF performance should be carefully considered by practitioners" (page 481). DIBELS has emerged as one of the most frequently utilized assessment measures of the early 21st century. Although published empirical support for most indicators is adequate, evidence to justify use of these measures for progress monitoring and screening decisions should be further examined to ensure that educators are making the best possible decisions for emerging and early readers. (p. 481)

How Is DIBELS Used in Elementary Schools?

DIBELS is a very valuable assessment tool for primary teachers in America. It provides a great deal of information about students and their grasp on phonological awareness, phonemic awareness, the alphabetic principle, and fluency. "Most frequent uses for DIBELS included identification of at-risk students, intervention development, and progress monitoring (Hoffman, Jenkins, & Dunlap, 2009, p. 1). It is extremely important that teachers use this data the right way, because unfortunately, we "often neglect the purpose of data collection" (Fisher et al., 2011a, p. 1). Useful, purposeful assessments "require ongoing and comprehensive data collection that enables language arts teachers to accurately determine students' existing proficiencies, to identify potential areas of challenge, and to tailor instruction to address those strengths and needs" (Fisher et al., 2011a, p. 1). One of the main purposes of DIBELS is to help teachers determine those students who are struggling in the areas of focus. Oftentimes, intervention groups are formed based on this data. The students who are most at-risk based on the data are placed in a group in which they can receive extra practice on the skills with which they struggle. However, the group only makes up a very small percentage of the whole class. The teacher can then use the data, to some point, to help determine other groups for small group instruction. Flexible groups are sometimes formed so that tailor-made instruction can be given to those students who need it. Unfortunately, DIBELS is not a good assessment to use to determine groups that will challenge the most advanced learners. Other assessments are given to determine the skills in which advanced learners need additional support.

The Correlation Between DIBELS Scores and Future Reading Comprehension

Overall, the research agrees on the fact that DIBELS assessments do have some correlation with future reading comprehension, although some subtests are better at predicting

comprehension than others. Many different researchers discuss that the Oral Reading Fluency subtest has the most predictive power in terms of future reading comprehension, whereas others are not as significant. Goffreda et al., (2010) state: "stability of scores for PSF and NWF is promising for progress monitoring and screening purposes. However, lack of convergent validity and low levels of concurrent and predictive validity potentially limit the utility of scores from these measures" (p. 481). These authors (2010) also caution educators: "the limited ability of grade 1 early literacy indicators (i.e., LNF, PSF, NWF) to predict future academic achievement beyond ORF performance should be carefully considered by practitioners" (page 481). Goffreda et al. (2009) mention: "ORF is the only significant predictor of students' later standardized test scores" (page 549), and that "ORF performance alone yields the same levels of utility as all four indicators together. Thus, the other indicators, (i.e., LNF, PSF, NWF) provide redundant information in predicting future reading proficiency" (page 549). Reidel (2007) offered a different opinion, stating that:

> One of the most common criticisms of DIBELS is that it is not an adequate indicator of reading comprehension. This criticism is important because both proponents and critics of DIBELS agree that comprehension is the ultimate goal of reading. If DIBELS subtests are closely connected to comprehension, they can be used to identify students at risk for comprehension difficulties and to provide additional instructional support to these students. If DIBELS subtests are not closely related to comprehension, misallocation of resources will occur. (page 549)

This is clearly a viewpoint that is worth further research and consideration, and possibly even an overhaul of the DIBELS test or the creation of a new assessment. Reidel (2007) raises other

important criticisms as well stating that "it is not clear how closely reading comprehension is related to DIBELS tasks such as reading nonsense words (NWF) or pronouncing individual phonemes within words (PSF)" (p. 549), and "poor student performance on these subtests will lead to reading instruction being focused on these specific skills at the expense of other instructional strategies that would help overall reading ability" (p. 549). Reidel (2007) does conclude that "DIBELS ORF administered in first grade proved to be a good predictor of reading comprehension at the end of first grade and second grade" (p. 559).

There are many different viewpoints on the DIBELS assessment as well as differing opinions on how to interpret and utilize the results. Although many teachers in America are required to give DIBELS and have their hands somewhat tied when it comes to how intervention groups are formed from the results, it is important that teachers are savvy consumers of this subject. DIBELS is not a perfect assessment, and teachers need to give more than one assessment before making any major decisions. After all, there is no other assessment that has gained as much popularity as DIBELS, and it does provide educators with information that is pertinent to early reading.

CHAPTER III

METHODS

Design

This study was completed using a correlational design to determine whether fall and spring Dynamic Indicators of Basic Early Literacy Skills (DIBELS) scores related significantly to first graders' reading comprehension scores in the fall and spring quarters. A class of 19 first graders was tested using DIBELS subtests in the fall, winter, and spring of their first grade year. Fall and spring scores were correlated to reading comprehension assessment grades to see if DIBELS had concurrent or predictive relationships with first and final marking period grades.

Participants

Nineteen first graders, 11 boys and 8 girls, from a small, rural suburb in southern Maryland participated in this study. They were chosen because they were the students in the researcher's class. All students were either six or seven years old at the time of testing. The majority of students were Caucasian, with only two African American students. One student received special education, speech therapy, and occupational therapy services. One student experienced hearing problems. In this group, six students were reading below grade level, eight students were reading on grade level, and five students were reading above grade level at the beginning of the year based on data from kindergarten. Some of these students changed reading instruction groups throughout the year based on DIBELS data, reading comprehension scores, or teacher judgment. Two of the below grade level students participated in an intervention group which focused on strengthening phonics and comprehension skills. All students were administered the DIBELS subtests in the fall, winter, and spring, and participated in comprehension instruction

and completed Weekly Treasures Assessments throughout the year.

Instruments

There were two instruments used in this study: DIBELS and Treasures Weekly Assessments.

DIBELS

In the fall administration of DIBELS, instructors administered the following subtests to the students: Letter Naming Fluency (LNF), Phoneme Segmentation Fluency (PSF), and Nonsense Word Fluency (NWF). In the winter and spring administrations of DIBELS, instructors administered the NWF and Oral Reading Fluency (ORF) subtests. Brunsman reviewed DIBELS in the *Mental Measurement Yearbook* (2012). She stated:

> The administration and scoring guide contains a few indices related to reliability and validity, but the data provided are totally unusable because the developers do not describe the participants or methodologies used in the studies. The developers discuss indices related to alternate-form and internal consistency reliability, but do not mention inter-rater reliability. Three technical reports written by other authors are available on the DIBELS website and report concurrent correlations between the DIBELS and other measures. The developers have not described any studies investigating the predictive relationship of DIBELS scores to state assessments of reading standards. No information is provided about how the decision rules (cut scores) were developed or why the developers suggest instructional intervention for students with local percentile ranks of 40 or less. The effects of such demographic factors as gender, ethnicity, and income level on scores or predictive relationships are not mentioned.

Treasures Weekly Assessments

The Treasures Weekly Assessments were curricular reading assessments provided by the publisher, MacMillan McGraw-Hill. These assessments had a number of different focuses: phonemic awareness, phonics, high frequency words, comprehension, vocabulary, structural analysis, and grammar. For the purpose of this study, only the comprehension portion was correlated to DIBELS scores. On the comprehension portion of the Weekly Assessment, which is designed to assess the comprehension skill or strategy taught that week, administrators asked the students three selected-response questions for which they had to choose the correct answer. Half-way through the year, there was a short answer question added to the Weekly Assessment for which students were required to answer a question by writing a sentence. These questions were all based on a text not previously read by the students. Although the questions increased in difficulty through the year, the same testing format was used. The scores for the Weekly Assessments were determined using percentages of correct responses.

Procedure

Data for this study were collected in the 2011-2012 school year. DIBELS was administered to each child in a one-on-one setting with the classroom teacher.

For the Letter Naming Fluency subtest, a sheet of random upper and lower case letters was placed in front of the student. The student was instructed to look at each letter and say the name of that letter. The student was told that he had one minute for the activity. He was told to begin, the timer was started, and the student read as many letters as he could until the timer went off. The teacher recorded the student answers in that student's DIBELS booklet. The score for this subtest consisted of how many correct letter names the student read in one minute.

For the Phoneme Segmentation Fluency portion of DIBELS, the student was told that he would hear a word given to him from the teacher, and he had to say the sounds in that word. He was given two examples to try, and then was told that he had one minute to say the sounds in the words. The timer was started, and the teacher said a word, i.e., "hall". The student said the sounds he heard in "hall," the teacher recorded the responses in the DIBELS booklet, and then gave the student another word to try. This continued until the minute was up. The score for this subtest consisted of how many correct phonemes were segmented in one minute.

For the Nonsense Word Fluency subtest, which yielded two different scores, the student was told that he will read make believe words. He was shown a sheet of paper with two practice nonsense words. The teacher demonstrated how to read the first nonsense word, and then the student tried the second nonsense word. The teacher told the student that he had one minute to read nonsense words. A sheet of paper with nonsense words was placed in front of the student, the timer was started, and the teacher recorded the responses as the student read the nonsense words. This subtest had two scores: how many correct letter sounds were read in one minute (Correct Letter Sounds/CLS), and how many whole words were read in one minute (Whole Words Read/WWR).

For the spring administration of DIBELS, the Oral Reading Fluency subtest was given. For this subtest, students were asked to read a passage as best they could for one minute. The teacher started the timer and followed along in the DIBELS booklet, marking miscues as the student read. The student was then asked to retell the selection, and the number of ideas retold was counted and recorded in the DIBELS booklet. The score for this subtest consisted of how many words were read correctly in one minute, as well as how many ideas were retold. Once the

students completed the identified sub-tests, the teacher turned the booklets into the reading teacher for input into the computer.

The Treasures Weekly Assessments were given to the whole class of students at the end of each week of instruction, regardless of group. All students were administered the same test each week. The test packet was handed out to each individual child. Each child was required to read a short story passage on his own. After reading, the teacher instructed the entire class to look at the first question. The teacher read the questions, but the students were required to read the answer choices independently. The students were then instructed to fill in the bubble next to their answer choice. This process continued for each of the 12 questions on each test. Halfway through the year, a short answer question was included on the test, but the same process was followed. The teacher read the question and each student was responsible for answering it on his or her own in a complete sentence, looking back at the text if needed. At the end of administration, the teacher collected the tests and graded them using a percentage scale. Scores from each test during the marking period were averaged to yield a final percentage score.

CHAPTER IV

RESULTS

This chapter presents the results of correlational analyses that investigated the relationship between fall and spring DIBELS scores and reading comprehension grades.

Fall and spring DIBELS Scores and Comprehension Grades

Below are descriptive statistics for each of the DIBELS and reading comprehension grades collected for the nineteen participants in this study.

Table 1
Descriptive Statistics

	Mean	Std. Deviation	Range
Fall Correct Letter Sounds	47.105	19.675	22-101
Fall Whole Words Read	8.684	7.959	0-32
Fall Letter Naming Fluency	55.790	11.098	35-78
Fall Phoneme Segmentation Fluency	44.579	15.196	9-61
Spring Correct Letter Sounds	84.474	24.740	47-141
Spring Whole Words Read	25.000	10.039	10-48
Spring Oral Reading Fluency	91.316	27.404	35-137
First Semester Reading Comprehension Grade	89.737	3.827	82-95
Final Semester Reading Comprehension Grade	90.474	4.033	76-95
n=19			

The descriptive statistics above show that there was an increase in the scores of the two DIBELS subtests that were given in both the fall and spring, namely Correct Letter Sounds and

Whole Words Read. There was a small increase in mean reading comprehension scores, but it was less than one percentage point. In comparison, the mean fall and spring Correct Letter Sounds scores almost doubled. When comparing the mean fall and spring Whole Words Read scores, they almost tripled. The mean spring Oral Reading Fluency score was considerably higher than the goal of 42 words per minute. The Letter Naming Fluency and Phoneme Segmentation Fluency tests were only given in the fall, but these descriptive results were included because they are important to school-based grouping decisions made at the beginning of the year. The Oral Reading Fluency subtest was only given in the spring, and is important because grouping decisions for second grade may be made based on this subtest. Therefore, it is important to look at their correlations to reading comprehension scores.

Relationships between DIBELS and Reading Comprehension Grades

The concurrent and predictive relationships between DIBELS scores and comprehension grades were examined by correlating all of the fall and spring DIBELS assessment scores and reading comprehension grades.

Concurrent Relationships

Correlations were computed between DIBELS scores and reading comprehension grades in the fall and spring to see if any concurrent relationships were significant at either time.

Fall Data

Descriptive statistics for fall are re-posted in Table 2 and correlations between fall DIBELS and fall Reading Comprehension grades are presented in Table 3. Those correlations which were statistically significant (2 tailed test, p<.05) are marked with asterisks.

Table 2
Fall Data Descriptive Statistics

	Mean	Std. Deviation
Fall Correct Letter Sounds	47.105	19.675
Fall Whole Words Read	8.684	7.959
Fall Letter Naming Fluency	55.790	11.098
Fall Phoneme Segmentatio n Fluency	44.5790	15.196
First Semester Reading Comprehens ion Grade	89.737	3.827
n=19		

Table 3
Fall Data Concurrent Correlations

	Fall Correct Letter Sounds	Fall Whole Words Read	Fall Letter Naming Fluency	Fall Phoneme Segmentation Fluency	First Semester Reading Comprehension Grade
Fall Correct Letter Sounds	1	.825[**]	.448	.287	.357
Fall Whole Words Read		1	.375	.122	.395
Fall Letter Naming Fluency			1	.183	-.110
Fall Phoneme Segmentation Fluency				1	-.047
First Semester Reading Comprehension Grade					1

**. Correlation is significant at the 0.01 level (2-tailed).

As can be seen in Table 3, none of the fall DIBELS scores correlated significantly with first semester reading comprehension grades. The fall Letter Naming Fluency and Phoneme Segmentation subtests actually had a negative correlation with fall reading comprehension grades, meaning that scores above the mean on these subtests were associated with scores below the mean in reading comprehension. The most significant correlation was between the fall Correct Letter Sounds and Whole Words Read subtest scores, showing that a higher score on one subtest was typically associated with a higher score on the other. These results should have significant meaning for the teaching of reading, because fall DIBELS scores for this sample did not necessarily mean anything in terms of students' concurrent reading comprehension scores.

Based on the fall concurrent correlations, all of the following null hypotheses were retained as none of the correlations between any of the four fall DIBELS subtests and the students' fall reading comprehension grades differed significantly from zero:

$$ho_{1a}: r_{\text{(fall DIBELS:CLS)(1st period Rdg comprehension grade)}} = 0$$

$$ho_2: r_{\text{(fall DIBELS:WWR)(1st period Rdg comprehension grade)}} = 0$$

$$ho3: r_{\text{(fall DIBELS: LN)(1st period Rdg comprehension grade)}} = 0$$

$$ho4: r_{\text{(fall DIBELS: PS)(1st period Rdg comprehension grade)}} = 0$$

In fact, only the correlation between the CLS and WWR DIBELS subtests was significant.

Spring Data

Descriptive statistics for spring are re-posted below in Table 4 and correlations between spring DIBELS and Reading Comprehension grades are presented in Table 5. Those correlations which were statistically significant (2 tailed test, $p<.05$) are again marked with asterisks.

Table 4

Spring Data Descriptive Statistics

	Mean	Std. Deviation
Spring Correct Letter Sounds	84.474	24.740
Spring Whole Words Read	25.000	10.039
Spring Oral Reading Fluency	91.316	27.405
Final Semester Reading Comprehension Grade	90.474	4.033
n=19		

Table 5
Spring Data Concurrent Correlations

	Spring Correct Letter Sounds	Spring Whole Words Read	Spring Oral Reading Fluency	Final Semester Reading Comprehension Grade
Spring Correct Letter Sounds	1	.960[**]	.595[**]	.215
Spring Whole Words Read		1	.624[**]	.338
Spring Oral Reading Fluency			1	.289

**. Correlation is significant at the 0.01 level (2-tailed).

The spring correlations yield the same conclusions as the fall correlations: none of the spring subtests correlated significantly with concurrent reading comprehension grades. As in the fall, significant correlations were seen between the spring Correct Letter Sounds and Whole Words Read scores (r=.960, p<.000). Also significant were the correlations between the spring Correct Letter Sounds score and Oral Reading Fluency scores (r=.595, p<.007); and the spring

Oral Reading Fluency and Whole Words Read scores (r=.624, p<.004). The lack of significance of the concurrent correlations between the DIBELS subtests and reading comprehension grades suggests that these relationships could be a result of mere chance. This is less likely the case when looking at the correlations between the DIBELS subtest scores.

Based on the spring concurrent correlations, all of the following null hypotheses were also retained, as none of the correlations between any of the three spring DIBELS subtests and the students' spring (final semester) reading comprehension grades differed significantly from zero:

$$ho_5: r_{(spring\ DIBELS:CLS))(final\ period\ Rdg\ comprehension\ grade)} = 0$$

$$ho6: r_{(spring\ DIBELS:WWR))(final\ period\ Rdg\ comprehension\ grade)} = 0$$

$$ho7: r_{(spring\ DIBELS:ORF)(final\ period\ Rdg\ comprehension\ grade)} = 0$$

Predictive relationships

Finally, predictive correlations were computed between fall DIBELS scores and spring reading comprehension grades to see if any of these relationships were significant, suggesting fall DIBELS scores related to end-of-year reading comprehension grades.

Table 6

Predictive Correlations between DIBELS and Reading Comprehension Grades

	Final Semester Reading Comprehension Grade
Fall Correct Letter Sounds	.100
Fall Whole Words Read	.093
Fall Letter Naming Fluency	.078
Fall Phoneme Segmentation Fluency	.226
n=19	

As shown in this table, the fall DIBELS scores had very low correlations with final semester reading comprehension grades. The Pearson correlation scores are extremely low and none were statistically significant, indicating that each of these correlations could have been simply due to chance. Therefore, all of the following null hypotheses were also retained, as none of the correlations between the four fall DIBELS subtests and the students' final semester reading comprehension grades differed significantly from zero:

$$ho8: r_{(fall\ DIBELS:CLS)(final\ period\ Rdg\ comprehension\ grade)} = 0$$

$$ho9: r_{(fall\ DIBELS:WWR)(final\ period\ Rdg\ comprehension\ grade)} = 0$$

$$ho10: r_{(fall\ DIBELS:\ LN)(final\ period\ Rdg\ comprehension\ grade)} = 0$$

$$ho11: r_{(fall\ DIBELS:\ PS)(final\ period\ Rdg\ comprehension\ grade)} = 0$$

Overall, significant correlations were not seen between any of the DIBELS subtests and reading comprehension. The correlations that were observed through this study were only between certain subtests, and the majority of the correlations were not significant.

CHAPTER V

DISCUSSION

The original null hypotheses in this study were supported. No statistically significant correlations were found between fall and spring DIBELS scores and reading comprehension scores. The only significant correlations between two of the DIBELS subtest scores were those on Correct Letter Sounds and Whole Words Read (portions of the NWF subtest).

Implications

The most significant implication resulting from this study is that first grade teachers need to be extremely careful when using DIBELS results in making important instructional decisions. Teachers use DIBELS scores in part to help determine skill-based groups   -- at grade level, below grade level, or above grade level. Because the concurrent and predictive correlations between DIBELS scores and reading comprehension were low, and comprehension is the main goal of reading instruction, teachers need to be vigilant in using measures other than DIBELS to determine groupings. Based on these findings, DIBELS should never be the only assessment measure used to make instructional decisions.

Threats to Validity

There are a number of threats to the validity of this study. First, the DIBELS subtests differed across testing intervals. In the fall, the students were given the Letter Naming Fluency, Phoneme Segmentation Fluency and Nonsense Word Fluency subtests. The Nonsense Word Fluency subtests contain two scores, which are the Correct Letter Sounds and Whole Word Read scores. In the spring, students were given the Nonsense Word Fluency and Oral Reading Fluency subtests. Had the subtests in each testing interval been the same, the relationship between the DIBELS and reading comprehension grades might have been clearer; or the

relationships at the 2 intervals could have been more directly compared.

Another threat to validity concerns the reading comprehension assessments. Although all students were given the same tests, each week yielded a different assessment that tested different skills related to reading comprehension. Because the reading comprehension tests were not constant, their varied content may have had an impact on the correlations.

The timing of the DIBELS administrations may also compromise their validity and the consequent results of this study. Students were given the fall DIBELS test within the first few weeks of entering first grade. This is a time where they are becoming accustomed to a new grade, new classroom, new teacher and new friends, and a way of learning that is significantly different from kindergarten. The spring DIBELS test was given in late April, when students are much more accustomed to first grade in general. The skills they learned were also much more familiar to them than in the first weeks of school. This contrast could have resulted in fall DIBELS scores that underestimated actual skills.

Teachers use the results of the fall DIBELS tests in part to form their ability-based groups. Because these groups are differentiated, they learn different skills and may be taught in different ways. This could have an impact on the scores of the reading comprehension tests, especially if one group focused more on comprehension skills, and another group focused more on phonics skills. If students were not learning the exact same material, the varied interventions may have impacted their scores on the DIBELS and/or the reading comprehension tests and consequently the correlations between those scores. Also, if students switch groups throughout the year, which did happen in with this study's sample, this could change the type of information learned and consequently the DIBELS or reading comprehension test results and correlations between them could change accordingly.

Connections to Previous Research

There have been limited studies that have focused on the correlation between DIBELS and reading comprehension. Reidel (2007) looked at the relationship between DIBELS, reading comprehension, and vocabulary in urban first grade students. This study determined that "DIBELS ORF administered in first grade proved to be a good predictor of reading comprehension at the end of first grade and second grade" (Reidel, 2007, page 559). Reidel (2007) also concluded that "the remaining DIBELS subtests were less accurate predictors of comprehension, with Phoneme Segmentation Fluency (PSF) being the weakest predictor" (page 559). These results differ somewhat from the results of this study. Reidel (2007) also suggests "if the goal of DIBELS administration is to identify students at risk for reading comprehension difficulties, the present results suggest that by the middle of first grade, administration of DIBELS subtests other than ORF is not necessary" (page 559).

Some studies have looked at DIBELS and its reliability and validity, and these studies have shown that the reliability and validity of DIBELS is satisfactory. These studies do caution teachers to use DIBELS results carefully when making instructional decisions. In Goffreda et al., (2009) study, it was discovered that DIBELS subtests were a good predictor of future reading proficiency on state tests (page 584). As Reidel found, the most significant indicator of future reading proficiency was the Oral Reading Fluency subtest (Goffreda et al., 2009, page 549).

Implications for Future Research

Because the correlations between DIBELS subtests and reading comprehension were not significant, it is important to consider if there is even a place for DIBELS as an assessment measure or tool for placing students in groups with the ultimate aim of increasing reading

comprehension. Although it does provide useful information, it is not correlated to reading

comprehension, and that is the goal of reading in general. Studies would be needed to see if

there are other aspects of reading, such as phonemic awareness or phonics, that correlate more

significantly to DIBELS subtests and could guide instruction in these fundamental skills to result

in better comprehension.

Another idea for future research is to look at other first grade assessments to see if they

correlate more significantly to reading comprehension in first grade. There are not many

assessments that are age appropriate for first graders, so if one could not be found, then one may

need to be developed.

Summary

The focus of this study is important for primary teachers who are responsible for teaching

reading comprehension and administering DIBELS. Although this study showed limited

correlations between the two, DIBELS is still a popular tool used in kindergarten, first grade, and

second grade classrooms. Other studies conducted on this subject have suggested that DIBELS

has satisfactory validity and reliability. There were numerous limitations in this study which

may have affected the results, but overall, the results support the conclusion that teachers should

exercise caution and consider data in addition to DIBELS results when they make instructional

decisions.

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