

The Relationship between Fluency and Comprehension

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Table of Contents

List of Tables	i
Abstract	ii
I. Introduction	1
Statement of Problem	2
Hypothesis	2
Operational Definitions	2
II. Review of the Literature	4
Defining Fluency and Comprehension	5
Relationship between Fluency and Comprehension	8
Boosting Reading Fluency and Comprehension in the Classroom	9
Progress Monitoring Fluency and Comprehension	14
Summary	18
III. Methods	19
Design	19
Participants	19
Instruments	20
Procedure	20
IV. Results	22
V. Discussion	24
Implications of Results	25
Threats to Validity and Reliability	26
Connections to Previous Studies	28

Recommendations for Future Research	29
References	32

List of Tables

1. Means and Standard Deviations of DIBELS Oral Reading Fluency and MAP Reading Scores	22
2. Pearson Correlation between DIBELS Oral Reading Fluency and MAP Reading Scores During Each Test Interval (Fall, Winter, and Spring)	22

Abstract

The purpose of this study was to examine the relationship between reading fluency and comprehension and whether a student's fluency rate impacted his or her ability to comprehend information. The study looked closely at the performance of 23 students enrolled in a second grade class. The measurement tools used were the Dynamic Indicators of Basic Early Literacy Skills, Sixth Edition (DIBELS), Oral Reading Fluency Assessment, and the Measures of Academic Progress Reading Assessment. The study involved the use of data collected during fall, spring, and winter testing intervals from the 2014-2015 school year. A Pearson correlational study was used to analyze the data collected during the testing intervals. The analysis showed a significant relationship between data collected during the fall and spring testing intervals but did not support a significant relationship during the winter testing interval. The results could be attributable to a number of intervening factors; however, though the findings varied, two out of the three results support the importance of teaching fluency and comprehension together.

CHAPTER I

INTRODUCTION

Overview

Researchers have taken a closer look at the components associated with reading instruction: phonemic awareness, phonics, vocabulary, fluency, and comprehension. Research has determined that during the first several years of reading development, the components of reading are tightly linked (Beach & O'Connor, 2014). Two of the components, fluency and comprehension, intrigued researchers more than the others as fluency was just beginning to gain a focus. Comprehension had always been a discussed component in reading, but researchers questioned whether a relationship existed between fluency and comprehension. Researchers set out to bridge the gap between fluency and comprehension, to determine if fluency rate has a significant impact on the ability to comprehend information being read.

The primary purpose of reading is to gain meaning from connected text, so if the individual words do not make sense, then the overall meaning of the story or text is lost (Brummitt-Yale, 2014). Also important to this purpose is the accuracy of text recognition and that over time it becomes a fluent process (Wise et al., 2010). This is critical because in order for reading to proceed effectively, the reader cannot focus on trying to comprehend the text while at the same time trying to decode and read words successfully. If a reader's attention is drained by decoding words, there is little or no capacity for attending to the demanding process of comprehending (Pikulski & Chard, 2005). One also has to keep in mind that fluency, though a big part, is not solely responsible for a reader's ability to be able to comprehend information. A reader also has to take responsibility to pay attention to the text as they read, use context clues,

and employ other comprehension strategies to help aid in their success with gaining meaning from the text.

Comprehension strategies and fluency strategies can be taught through proper classroom instruction or interventions. However, being taught the strategies is not enough, and young readers need to be given the opportunity to practice and apply the strategies in order to help them develop their reading skills. If they are not given the opportunity to practice and apply the strategies, the classroom teacher is most likely not going to see much improvement in a student's ability to read words without error or gain meaning from text. A young reader would continue to develop gaps with their reading abilities, making it harder over time to reverse the problem, which can lead to problems later on as reading is a critical component of everyday life.

Statement of Problem

This study examined the relationship between fluency and reading comprehension. It is designed to determine whether a student's fluency rate impacts his or her ability to comprehend information.

Hypothesis

The results measured on the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), Oral Reading Fluency Assessment, and the Measure of Academic Progress (MAP) Reading Assessment will show no significant relationship between second grade students' reading fluency rates and comprehension abilities.

Operational Definitions

In this study, reading fluency was measured by students' performance on the Dynamic Indicators of Basic Early Literacy Skills (DIBELS). The assessment determines fluency rate as the number of words read per minute. The students read three passages, their rates per reading

are averaged, and then the averages are compared to the benchmark target score. From this point, the student score can be ranked into one of three categories: At Risk, Some Risk, and Low Risk. In the beginning of second grade, students who perform within a 0-25 range in the fall, 0-51 range in the winter, and 0-69 range in the spring would be categorized as At Risk. Students who perform within a 26-43 range in the fall, 52-67 range in the winter, and 70-89 in the spring would be categorized as Some Risk. Finally, students who perform within 44+ range in the fall, 68+ in the winter, and 90+ in the spring would be categorized as Low Risk.

Reading comprehension performance was measured by the Measure of Academic Progress Assessment (MAP), which has recently been instated by the Baltimore County Public School system with the adoption of the Common Core. It is a state-aligned, computerized, adaptive assessment program that measures the student's mastery of skills and growth over time. The scores collected for each component of the assessment are rated using an RIT scale (Rasch unIT), which is an equal-interval scale that measures individual test questions. The RIT score has a range of 95-300, and the scores are continuous, making it possible to use the RIT score to help measure progress and track a student's educational growth from year to year. The scores are independent of the age or grade of the students and provide an estimation of the instructional level they are currently performing within. The students' scores are shown on a growth guideline chart, which shows their scores in relation to a National Norm median RIT score for students their age and grade level who are tested at the same time of year. Students' scores are also compared to an average mean RIT score for the school district, again comparing students their age and grade level being tested at the same time of year. The portion of the assessment used for this study is the student's average RIT scores from the reading and language usage section.

CHAPTER II

REVIEW OF THE LITERATURE

Reading successfully is a complex interaction of language, sensory perception, memory, and motivation (Pikulski & Chard, 2005). Since reading and learning to read are complex tasks, it is essential for reading instruction to address numerous components such as phonemic awareness, phonics, vocabulary, fluency, and comprehension to be effective and help students to achieve success as readers. This literature review is going to focus on two of the five components, fluency and comprehension, as they have gained a significant amount of attention from researchers over the last twenty years.

As interests peaked in understanding fluency and comprehension, researchers began questioning whether a relationship existed between the two and if or how one affects the other. Researchers set out to bridge the gap between fluency and comprehension and in doing so wanted to understand the impact of fluency rate on a student's ability to comprehend the information being read.

In order to uncover the relationship between fluency and comprehension, the first section of this literature review will offer an overview of fluency and comprehension, defining and describing each component and its role in reading instruction. The second section will identify whether a relationship between fluency and comprehension exists. In the third section of the review, ways of boosting reading fluency and comprehension in the classroom will be examined. It will highlight strategies and techniques identified by researchers as good tools for helping to improve both fluency and comprehension in order for students to become stronger readers. The final section of the review will identify ways to monitor students' performance and growth rate with fluency and comprehension.

Defining Fluency and Comprehension

Over the last twenty years, there has been an increased interest in fluency and comprehension, recognizing their key roles in the development of reading not only as individual components, but also a relationship between the two components (Beach & O'Connor, 2014). Before determining if a relationship exists between fluency and comprehension, it is important to understand each component separately and its role in reading instruction.

Before gaining more attention recently, fluency had been a neglected aspect of reading instruction (Pikulski & Chard, 2005). According to Pikulski and Chard (2005), the elevated attention on fluency can be credited to the *Report of the National Reading Panel*, which is published by the National Institute of Child Health and Human Development (NICHD) and a researcher named Kenneth E. Stanovich. Pikulski and Chard explain that the National Reading Panel was influential in bringing attention to fluency both by claiming fluency develops from reading practice and by changing the concept of fluency by defining it as one of the five critical components of reading instruction. Stanovich was also influential in bringing attention to fluency because of an article he wrote in 1986 where he discussed a clear relationship between fluency and the amount a reader engages in the reading process (Pikulski & Chard, 2005). According to Pikulski and Chard, Stanovich pointed out that those who read more extensively grow in all skills that contribute to fluency and are more likely to become fluent readers than those who lack fluency skills or avoid reading because they find reading difficult. With the added attention brought to fluency by the National Reading Panel and Stanovich, many key terms started to surface in relation to fluency.

Many of the key terms associated with fluency are all time-related, such as reading rate or speed, speed of processing, and automaticity, which refers to the immediate recognition of words

that would bypass the decoding process (Bashir & Hook, 2009). Additional terms associated with fluency are accuracy and prosody. Accuracy refers to when an individual is able to read without error and prosody refers to when an individual is able to provide appropriate expression implied by the text (Wise et al., 2010). These terms appear repeatedly in definitions associated with fluency.

Many researchers have contributed to the definition of fluency. One researcher defines fluency as the “ability to read most words in context quickly, accurately, automatically, and with appropriate expression” (Cunningham, 2005, p. 54). Another researcher defines fluency as “the ability to read connected text rapidly, smoothly, effortlessly, and automatically with little conscious attention to the mechanics of reading, such as decoding” (Bashir & Hook, 2009, p. 196). Though both definitions are phrased differently, they draw attention to the fact that fluent readers should be efficient and have effective word recognition skills, freeing them from word identification problems and allowing them to construct meaning from the text (Pikulski & Chard, 2005).

Students who read fluently have the ability to read with proper phrasing, intonation, and stress (Graves, Juel, Graves, & Dewitz, 2011). According to Cunningham (2005), fluent reading puts words together in phrases, has the expression used when speaking, sounds natural, and is effortless. Readers who have not yet developed fluency are known as non-fluent readers, and their reading is slow, halting, laborious, and choppy because they read word by word (Therrien, Gormley, & Kubina, 2006). They read this way because they have to concentrate on each word they come across and use cognitive resources to decode (Therrien et al., 2006). Young readers may begin to recognize many words automatically when reading, but their oral reading will still lack the expression needed to be fluent, and often times their reading is monotone (Armbruster,

Lehr, & Osborn, 2001). Fluency is not a stage of development but a gradual process that develops over a considerable amount of time and requires substantial practice to be able to read words quickly and easily (Armbruster et al., 2001). Armbruster et al. (2001) point out a person's fluency ability changes depending on what he or she is reading, his or her familiarity with words, the amount of practice with reading text; even very skilled of readers may struggle with fluency at times, resorting back to a slow, labored manner when reading text with unfamiliar words or topics.

Comprehension is the basis for reading and is the process by which readers construct meaning (Pardo, 2004). It is defined by the National Reading Panel as the act of understanding and interpreting information within text (Shanahan & North Central Regional Educational Lab (NCREL), 2005). To help with comprehension, a reader needs to be interactive with the text before, during, and after reading, accessing prior knowledge or relating personal experiences to information in the text (Pardo, 2004; Brummitt-Yale, 2014). Pardo (2004) explains the level of interaction the reader takes towards the reading affects his or her overall relationship to the text and can either be useful towards or can hinder comprehension.

There are many components that have to work together to form comprehension. A reader must have phonemic awareness abilities, phonics skills, fluency, and vocabulary knowledge (Shanahan & NCREL, 2005). If a student is lacking in any of the language components and cannot translate written text into oral language, comprehension will be blocked, and the student will not be able to understand or interpret the information within the text when reading (Shanahan & NCREL, 2005). According to Brummitt-Yale (2014), without comprehension, reading is nothing more than tracking symbols on a page with the eyes and sounding them out. If the individual words do not make sense, then the overall meaning of the text is lost.

Fluency and comprehension are each complex concepts that play an important role in reading instruction. Both have complicated processes that develop over time to improve a reader's ability to read and understand text. This connection has increased the interest in their relationship and their role together within the overall process of reading (Pikulski & Chard, 2005).

Relationship between Fluency and Comprehension

Researchers have found that there is a reciprocal relationship between fluency and comprehension, but they acknowledge the relationship remains complex (Pikulski & Chard, 2005). The relationship between fluency and comprehension is found to be the most crucial and strongest in the first four years of a reader's development (Beach & O'Connor, 2014). Fluency is seen as an important and significant predictor of reading comprehension and has been recognized for setting the grounds to higher language and cognitive practices underlying comprehension (Bashir & Hook, 2009; Wise et al., 2010). When gains are made in fluency, most readers can focus their attention on comprehension and understand what they have read (Pikulski & Chard, 2005). As readers develop efficient word recognition, it frees up processing resources in the brain no longer needed for decoding, allowing readers to focus on meaning and comprehension (Bashir & Hook, 2009).

Bashir and Hook (2009) also emphasize that even though we often see a positive relationship between fluency and comprehension, showing gains in both areas, slow word recognition and non-fluent reading, interferes with effective comprehension. If young readers are too focused on word reading, then little remains for higher-level comprehension because they have to frequently stop to figure out unknown words. In a study conducted by the National Reading Panel, a representative sample of the nation's fourth grade students was polled. In this

study, the researchers were able to determine that 44% of the population tested was not fluent when reading grade level appropriate materials, and those who scored low on fluency measures also scored low on comprehension (Armbruster et al., 2001). It was within this large scale data analysis the National Reading Panel established a correlation between fluency and comprehension, showing that poor fluency skills can significantly interfere with comprehension.

Readers of all ages and at any given time, whether fluent or not, can encounter reading difficulty. Bashir and Hook (2009) generated a list of factors that disrupt reading fluency and significantly interfere with comprehension. One of the factors identified is having limited background knowledge about a topic and being unfamiliar with the text structure or language within the book. Bashir and Hook continue to explain that readers of any age can encounter words they have never seen before, cannot recognize quickly, do not know the meaning of, or whose context clues are not helpful. Sentences may be too long or complex in structure, and the reader has to hold too much in his or her mind before he or she is able to understand what is read. As a result, the meaning becomes jumbled or unclear (Bashir & Hook, 2009). Finally, a disruption in fluency and comprehension can occur because a reader may feel discomfort or dislike towards a book, may lose motivation while reading, or may simply lose his or her place and have to spend time going back over the text to catch up with the meaning.

Boosting Reading Fluency and Comprehension in the Classroom

Classroom teachers serve as motivators and guides for their students, helping them navigate through the reading process with the ultimate goal of developing strong independent readers. Providing students with instruction and practice in both fluency and comprehension is an essential role of the classroom teacher (Armbruster et al., 2001). “Fluent reading and reading comprehension tap similar but independent aspects of the reading process,” (Cohen, Krustedt, &

May, 2009, p. 103) and, therefore, the instruction and practice associated with fluency and comprehension should be different for both components.

Fluency practice should be woven into all aspects of reading instruction and not be taught in isolation or treated as its own reading program (Hudson, Lane, & Pullen, 2005). Researchers can agree that fluency develops best from reading practice, but the question researchers have is which method of reading practice is most effective: repeated oral reading or independent silent reading (Armbruster et al., 2001; Hasbrouck, 2006; Hudson et al., 2005). In the first approach, repeated oral reading, commonly known as repeated reading, gives students the opportunity to read the same text several times and receive guidance and feedback from the teacher (Armbruster et al., 2001; Hasbrouck, 2006). The second approach, independent silent reading, encourages students to read extensively on their own with minimal or no guidance and feedback (Armbruster et al., 2001; Hasbrouck, 2006). The National Reading Panel investigated the two major instructional approaches and did not find evidence to support encouraging independent silent reading as a means to improving reading achievement, suggesting its effectiveness is unproven (Armbruster et al., 2001). What the National Reading Panel did find was evidence supporting the use of repeated reading with guidance and feedback as an effective approach that led to improved word recognition, speed, accuracy, and overall improved fluency, comprehension, and reading achievement (Armbruster et al., 2001).

There are several repeated reading strategies that can be put into place in the classroom to help improve fluency and overall reading achievement. One strategy is to provide students with the opportunity to participate with oral repeated reading of text that is appropriate to their independent reading level and should be relatively easy for them, containing words they know or can easily decode (Armbruster et al., 2001). Modeling is another important aspect of fluency

instruction (Armbruster et al., 2001; Graves et al., 2011; Hasbrouck, 2006). Modeling fluent reading demonstrates how accurate reading can be done at a reasonable rate and with good phrasing, intonation, and expression (Hasbrouck, 2006). Teachers should model fluent reading throughout the day in whole group, small groups, or one on one with students. Modeling can be done through such practices as choral reading, cloze reading, tape-assisted reading, and partner reading (Armbruster et al., 2001; Hasbrouck, 2006; Graves et al., 2011). Choral reading is a whole or small group exercise where students read together following the teacher's pace. Cloze reading is similar to choral reading, but the teacher does most of the oral reading while students read along silently as they listen to the teacher read. During cloze reading, the teacher may omit important vocabulary or content words, and the students' job is to fill them in. In tape-assisted reading, students read along in their books as they listen to the audiotape of a fluent reader reading the book. As technology has changed, classrooms may be equipped with CDs, an iPod with mp3 audio, or a tablet device with a digital copy and recording of the book. Partner reading is another way for students to model fluent reading with each other. The teacher may select this method after teaching the students some techniques for giving feedback and managing their time. In addition, the teacher may select the partners so as to pair a more fluent reader with one who is not as proficient. Some additional strategies that can be conducted are timed reading, Readers' Theater, and poetry readings (Armbruster et al., 2001; Hasbrouck, 2006; Graves et al., 2011). Timed reading helps teachers monitor how many words per minute students are able to read and the number of words read accurately or miscued in the amount of time given. Readers' Theater and poetry reading are found to be enjoyable reading styles for students. They promote repeated reading as students enjoy reading to learn roles or parts as well as the rhythm, rhyme, and repetitiveness found in poetry. Finally, Hasbrouck (2006) suggests finding instructional time for

word recognition and word analysis is beneficial for beginning readers as it allows them the opportunity to learn to read words accurately. This is an important step in becoming a skillful, proficient, and motivated reader, according to Hasbrouck. Additionally Hasbrouck suggests that during fluency instruction, the teacher should not push reading faster too soon as it could cause some students to begin guessing or undermine their focus on reading carefully.

Reading carefully is an important part of the reading process; however, it is not enough to guarantee full comprehension of text. Readers need to be taught comprehension skills and strategies they can use throughout the pre-reading, during-reading, and post-reading phases of text reading (Graves et al., 2011). When comprehension skills and strategies are applied, it allows for a transaction to occur between the reader and text, and within this transaction, comprehension can occur (Pardo, 2004). The teacher's role is to provide explicit or direct instruction of useful comprehension strategies to help readers understand, remember, and be able to communicate to others about what they read (Armbruster et al., 2001). Explicit or direct instruction incorporates teaching declarative knowledge (knowing what the strategy is), procedural knowledge (how to use the strategy), and conditional knowledge (knowing when the strategy is most useful or applicable) (Dougherty-Stahl, 2004). Declarative knowledge requires and uses direct explanation of the strategy from the teacher to the students and can be accompanied by a visual strategy card, while procedural knowledge and conditional knowledge requires modeling and guided practice of the strategies so students know when and how to use them (Armbruster et al., 2001; Dougherty-Stahl, 2004).

During instruction it is important for the teacher to activate students' prior knowledge before reading (Nation & Angell, 2006; Pardo, 2004). By doing so, information that is connected to the topic or concepts in the text is more accessible while reading, and the student is aware he

or she is somewhat knowledgeable about the topic. Pardo (2004) also remarks about the importance of the classroom teacher building prior knowledge by using visuals, text to text, text to self, and text to world connections. Teaching important vocabulary words prior to or during reading can help boost comprehension because it helps to eliminate spending too much time or mental energy on unknown words (Pardo, 2004). To also help eliminate too much time or mental energy on unknown words, teachers should take time during instruction to teach, model, and allow students to practice decoding skills (Pardo, 2004). Decoding skills are key to helping young readers figure out words they do not know, and in order to comprehend, they must be able to read the words. Helping young readers develop the ability to comprehend means teaching them how to interact with the text by paying attention to, identifying, and describing story elements such as plot, characters, and setting (Armbruster et al., 2001; Pardo, 2004). Teachers also instruct young readers how to use text features such as being able to read tables, charts, and graphs to gain more meaning from the text and to use bold print, highlighted words, and italics to recognize important words (Armbruster et al., 2001; Pardo, 2004). Additionally, in order to help boost comprehension in the classroom, students are taught and encouraged to monitor and clarify meaning as they read, ask and answer questions, make predictions, use inference and deduction, use graphic and semantic organizers, and evaluate, reflect, and summarize the important information in the text (Armbruster et al, 2001; Nation & Angell, 2006; Pardo, 2004). Being taught useful comprehension strategies and techniques helps young readers to focus on what is important as they read and learn to eliminate unnecessary information, making it easier for them to remember what they have read.

Fluency and comprehension strategies taught in the classroom are tools provided by classroom teachers during instruction to help boost reading achievement of young readers. The

teachers lay the foundation for what strategies to use and how to use them but need to remember those strategies do not guarantee a student's success or improvement in either fluency or comprehension. What a classroom teacher can hope for is that as students practice strategies in a group setting, they will become familiarized with them and transfer the strategies to other appropriate settings (Dougherty-Stahl, 2004). When students are able to transfer what they have learned and become aware of when, where, and how to use appropriate strategies, it helps them become purposeful, active readers who are in control of their comprehension, improving their fluency and overall reading achievement.

Progress Monitoring Fluency and Comprehension

Teaching students strategies for fluency and comprehension is not enough. Teachers cannot assume students are making progress in both skill areas without monitoring their progress. The classroom teacher can determine how to monitor growth within the classroom, but other forms of assessment may be mandated by the school, the school district, state, or now with Common Core, the nation to use. The monitoring process can be very time consuming, and the classroom teacher may require assistance from reading specialists in the building to effectively monitor students' performance and growth in fluency and comprehension abilities.

Growth over time with fluency and comprehension skills can be monitored through observations, classroom assessments, and standardized testing. The information gathered allows the teacher to keep track of student performance within the classroom and identify what students' strengths and weaknesses are within each component of the reading process. When assessing fluency, the components that should be focused on are rate, accuracy, expression, and comprehension (Graves et al., 2011). The assessment of comprehension is done by a teacher or reading specialist checking for the accurate recall of important information from the text, which

is provided by the student in either an oral retell or written response. The next section will take a closer look at some of the monitoring techniques available to teachers and reading specialists.

One of the most informal assessments a classroom teacher or reading specialist can do to assess fluency is listen to a student read out loud. While the student is reading out loud, the classroom teacher or reading specialist can monitor their oral reading performance by recording anecdotal notes about the student's accuracy and expression. Following the oral reading assessment, the classroom teacher or reading specialist may elect to check the student's comprehension of the material by asking questions and recording the responses alongside the other anecdotal notes. Informally assessing silent reading is more difficult as the student reading is not heard, but it can be recognized because the child reads rapidly, without seeming to struggle (Graves et al., 2011). Silent reading assessment lends itself more to the assessment of comprehension because following a silent read, the best way to know a student did not struggle, misread, or not understand what he or she read is to ask questions about the text. Teachers can use a variety of materials around the classroom to assess oral and silent reading ability with comprehension. They may use stories from reading anthology books, small group leveled readers, or select passages from curriculum based workbooks. Additionally, teachers and reading specialists may elect to use passages from the published *Informal Reading Inventory (IRI)* book, which in more recent publications is referred to as the *Qualitative Reading Inventory (QRI)*. It should be noted that passages pulled from the IRI/QRA books will not fully assess fluency as they are designed as a miscue analysis, and their purpose is to identify word recognition problems (Armbruster et al., 2001). Though the IRI/QRI will not detect rate of speed, in addition to word accuracy, a classroom teacher or reading specialist should be able to detect expression and comprehension following the reading of the passages. Since the assessment focuses mostly

on accuracy, it can be very time consuming as the classroom teacher keeps a running record on each student going up in reading level until a student reaches the frustration level of 70% accuracy or below for the word list and reading passages (Armbruster et al., 2001). Armbruster et al. (2001) suggest there are simpler ways to measure speed and accuracy of fluency. They suggest using a timed approach of calculating words per minute as a better and more appropriate way of monitoring fluency.

An example of a timed approach would be the *Dynamic Indicator of Basic Literacy Skills* (DIBELS) assessment, which is widely known and used in many schools systems. The DIBELS assessment was developed based on measurement procedures for Curriculum-Based Measurement (CBM) and created by Stan Deno and colleagues' program of research and development of CBM of Reading at the University of Minnesota (University of Oregon, 2008). The University of Oregon Center for Teaching and Learning (CTL) has done extensive research on the DIBELS assessment and describe it as a set of procedures and measures for assessing the acquisition of early literacy skills from kindergarten through sixth grade. The assessments are short, one-minute measures of phonological awareness, alphabetic principle, accuracy and fluency with connected text, vocabulary, and comprehension, which are the core reading components and are to be used to monitor the development of literacy and reading skills (University of Oregon, 2008). The University of Oregon (2008) also explains the assessment results can serve as an early predictor and identifier of students who are not progressing as expected with reading development and allows educators to monitor and determine student progress. The DIBELS assessment is administered three times a year, fall, spring, and winter, to make sure students are meeting benchmark goals. Any students who fall below the expected benchmark goal is administered DIBELS progress monitoring tests once a month between the

normal testing sessions. In terms of monitoring fluency and comprehension, students are first introduced to Oral Reading Fluency (ORF) and Retell Fluency (RTF) in first grade, which are then administered every year after that. The ORF portion of the test assesses a student's skill at reading connected text in grade level materials, while the RTF measures comprehension of the verbally read connected text (University of Oregon, 2008). The ORF assessment is administered one on one by the classroom teacher or reading specialist. The student is given one minute to read as much of the passage as he or she can. Student performance is measured by words omitted, substituted, and hesitations of more than three seconds, which are scored as errors whereas words self-corrected within three seconds are scored as accurate (University of Oregon, 2008). The number of correct words per minute is the oral reading fluency score. Following the ORF portion, students are then asked RTF questions with the purpose of providing a comprehension check for the ORF and identifying students whose comprehension is not consistent with their fluency (University of Oregon, 2008). The researchers from the University of Oregon (2008) noted that the DIBELS assessment through a series of studies has proven test-retest reliability for elementary students and criterion-validity from eight separate studies and is considered an adequate measure of Curriculum-Based Reading Measure. However, even though the DIBELS assessment has proven both reliability and validity, the University of Oregon suggests teachers should use additional information about their students along with the pattern of performance on the DIBELS measures to plan support for their students who need supplemental support.

No matter what form of monitoring or assessing is selected, it is clear that more than one method should be used to adequately assess a student's fluency rate and ability to comprehend

information from text. As students meet fluency and comprehension goals, it is important to make instructional adjustments to further meet their needs.

Summary

Researchers in the last few years have taken notice of the relationship between fluency and comprehension. Instruction should balance teaching students not only comprehension strategies, but also finding time to teach fluency and not overlooking its instructional importance. Researchers have noticed that as a student's fluency increases, the student will also show an increase in comprehension. The ultimate goal is for students to achieve fluency in both oral and silent reading with comprehension to make reading meaningful (Graves et al., 2011). It is also important to provide students with as many opportunities to read as possible, making reading purposeful and allowing students to read for enjoyment. If students have the opportunities to practice reading, increasing their word recognition and vocabulary skills, they will be able to understand text easier and become more confident, which creates lifelong readers.

CHAPTER III

METHODS

The purpose of this research study was to examine the relationship between fluency and reading comprehension in order to determine whether students' fluency rates impact their ability to comprehend information.

Design

The study used a correlational design in order to examine the relationship between two variables: fluency and comprehension. Participants in this study completed two measures that assessed their level of reading fluency and comprehension. Both assessments were given throughout the school year: once in the fall, then winter, and finally in the spring. The results of both assessments were analyzed and correlated to see if a relationship existed between the two variables.

Participants

The participants in this research study were 23 second grade students ranging in age from seven to eight years old from a Baltimore County Public School located in Catonsville, Maryland. The participants in the study ranged in reading abilities from low average to average. The sample population consisted of 13 boys and 10 girls. The demographic breakdown of the sample population consisted of 70% Caucasian, 17% African American, and 13% Multi-Ethnic. Hispanic, Asian, and Pacific Islanders were not represented in this sample study.

The participants in the study were selected from a group of 140 students and made up one of the six second grade classes. The population used for the study was a convenience sample.

Instruments

This study used two instruments: the Dynamic Indicators of Basic Early Literacy Skills, Sixth Edition (DIBELS) and the Measures of Academic Progress Assessment (MAP). The sections of the assessments used for this study included the Oral Reading Fluency portion of DIBELS and the Reading portion of MAP.

Procedure

In order to measure student performance, both assessments were administered individually and several times during the year. For the purpose of this study, data was collected during the winter and spring, and the procedures were repeated identically both times.

The DIBELS assessment is measured by having students individually read three different reading passages aloud for one minute. The students were informed they will be reading three different reading passages and would be timed for the one minute allotment. The researcher pointed to the first word in the passage, began the time, and tracked along with the student as he or she read, marking any hesitations, self-corrections, or any omitted or substituted words of more than three seconds. Once past the three seconds, mistakes were marked as errors. Time was kept by a stopwatch, and students knew to stop reading when the timer went off. To mark when a student ended reading, a bracket or line was drawn after the last word read by the student. The number of words correct per minute was recorded at the bottom of the passage. The steps were followed two more times until all three passages had been read. Once all three passages were completed, the number of correct words per minute for each passage was gathered and averaged in order to determine an oral reading fluency rate. The rate was divided into three categories: At Risk, Some Risk, and Low Risk. Scores were compared for the winter and spring part of the school year. Students who perform within 0-51 range in the winter and 0-69 range in the spring

would be categorized as At Risk. Students who performed within the 52-67 range in the winter and 70-89 in the spring would be categorized as Some Risk. Finally, students who performed within 68+ in the winter and 90+ in the spring would be categorized as Low Risk.

Unlike DIBELS, the MAP assessment is an untimed test. It is not taken orally or directly administered by the researcher or classroom teacher. The role of the researcher or classroom teacher was to monitor students during the process of the test. The MAP assessment is a self-paced, standardized, computer-based test where data is measured by students' responses to multiple-choice questions. Each test is unique, and the questions are based on the student responses, and the computer adjusts the difficulty level of the questions as the test progresses. The test length varies by grade level, from 32 to 52 questions. At the conclusion of the test, the student RIT score is immediately calculated based on student performance and displayed on the screen along with goal ranges. The RIT scale ranges from 95-300 points. During the testing time, students are to remain quiet, even after they have completed testing. Once each student has completed testing, the researcher or classroom teacher gives instruction on how to properly close out of the MAP testing program and shut down the computers. A class data chart can be pulled immediately by the classroom teacher to see where each student fell within the RIT range and more importantly see where they scored above or below their average RIT range in certain skill areas. The results allow the classroom teacher to make adjustments to instruction to better meet the specific needs of the students.

CHAPTER IV

RESULTS

The purpose of this research study was to examine the relationship between fluency and reading comprehension scores for 23 second grade students. This study used two instruments: the Dynamic Indicators of Basic Early Literacy Skills, Sixth Edition (DIBELS), and the Measures of Academic Progress Assessment (MAPS). The sections of the assessments used for this study included the Oral Reading Fluency (ORF) portion of DIBELS and the Reading portion of MAPS. Results of both assessments were analyzed using a Pearson correlation. The correlation was run for each test interval—fall, winter, and spring—in order to determine if a significant correlation existed between students' DIBELS ORF scores and their MAP reading scores. The results of the analysis are presented in Table 1 below.

Table 1

Means and Standard Deviations of DIBELS Oral Reading Fluency and MAP Reading Scores

Measure	Mean (Standard Deviation)
Fall MAP Reading	177.34 (10.77)
Winter MAP Reading	190.86 (13.19)
Spring MAP Reading	199.00 (10.52)
Fall Oral Reading Fluency	48.91 (10.52)
Winter Oral Reading Fluency	79.26 (10.50)
Spring Oral Reading Fluency	95.86 (8.15)

Table 2

Pearson Correlation between DIBELS Oral Reading Fluency and MAP Reading Scores During Each Test Interval (Fall, Winter, and Spring)

Measure	Pearson Correlations
Fall MAP Reading and Oral Reading Fluency scores	$r = .57$
Winter MAP Reading and Oral Reading Fluency scores	No significant correlation
Spring MAP Reading and Oral Reading Fluency scores	$r = .54$

* $p < .05$

The data in Table 1 shows the means and standard deviations for the group's DIBELS Oral Reading Fluency and MAP Reading scores for the fall, winter, and spring. The data in Table 2 shows the Pearson correlations for the groups DIBELS Oral Reading Fluency and MAP Reading scores during fall, winter, and spring testing intervals.

The data in Table 2 reveals fall MAP reading scores and fall oral reading fluency scores were significantly correlated, $r = .57, p < .05$, as were spring MAP reading scores and spring oral fluency scores, $r = .54, p < .05$. For the winter administration, there was no significant correlation between winter MAP reading scores and winter oral reading fluency scores. These results and their implications will be discussed in the next chapter.

CHAPTER V

DISCUSSION

The purpose of this research study was to examine the relationship between fluency and reading comprehension in order to determine whether the fluency rates of 23 second grade students impacted their ability to comprehend information. Data was collected from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), Sixth Edition, Oral Reading Fluency test and the Measures of Academic Progress Assessment (MAP) Reading test during three testing intervals. The tests were administered during the fall, winter, and spring.

Prior to testing a hypothesis was written stating that the results measured on the DIBELS Oral Reading Fluency and the MAP Reading Assessment would show no significant relationship between second grade students' reading fluency rates and comprehension abilities. The data collected during the three testing intervals provided two different outcomes in relation to the hypothesis.

The results from the fall and spring testing intervals did not support the null hypothesis as there was a significant relationship between second grade students' oral reading fluency rates and reading comprehension performance. The results from the winter testing interval, however, supported the null hypothesis as they suggested there was no significant relationship between second grade students' oral reading fluency rates and reading comprehension performance and a correlation could not be determined.

The results for fall and spring indicated that the strength of association between the variables, fluency and comprehension, was high and the correlation coefficient was significantly different from zero ($p < 0.05$). The correlation coefficient $p < 0.05$ means that the probability was less than 0.05 percent. The results for winter did not indicate an association between the two

variables, fluency and comprehension, and the correlation coefficient was not significantly different from zero due to being unidentifiable.

In summary, the results indicate that a higher score on DIBELS Oral Reading Fluency in the fall and spring was associated with a higher score on the MAP Reading Assessment. However, in the winter since the results did not indicate a correlation, it did not guarantee that a higher score on DIBELS Oral Reading Fluency would result in a higher score on the MAP Reading Assessment and vice versa.

Implications of Results

The implications of this study are valuable to educators because it provides information that teachers can use to help design their reading instruction. The study supports the idea that reading instruction should not only focus on teaching and building comprehension in the classroom, but also the importance of incorporating fluency instruction into daily reading practice. Out of the data collected, two out of the three testing intervals support a strong relationship between fluency and comprehension and the benefits of intertwining their instruction.

The study also provides helpful data to classroom teachers about each student in the classroom. The data can help target whether a child has a weakness with fluency, a weakness with comprehension, or is weak in both areas. The data also can show the teacher which students in the classroom are performing well in both areas and may be considered fluent readers or close to fluent readers with good comprehension. The data will also provide a recommended instructional level per student based on their testing scores. On the DIBELS, students will fall into one of three instructional categories: At Risk, Low Risk, and Some Risk. The MAP assessment uses a different instructional categorization system from DIBELS. Each student who

takes the MAP assessment receives an average RIT score, based on the Rausch unit Scale. The score will place him or her into one of four instructional categories: High, High Average, Low Average, and Low. Additionally, the MAP assessment provides a Lexile range to accompany the instructional level the student received.

The information collected from the DIBELS and MAP assessment can help the classroom teacher better target the needs of his or her students. They can look at the data to assist with placing children into small groups, identifying which skill the children in the classroom need to work on more, as well as identifying any children who may need additional services in reading instruction beyond what is provided in the classroom. Children who are flagged in the Some Risk and Low categories of both assessments may be eligible to receive pull-out or push-in support from reading specialists. The DIBELS data will also identify those students in the classroom who are performing well with fluency, and knowing which students are the stronger readers and are more fluent can allow the classroom teacher to spend less time on fluency practice with those students and more time building and strengthening their comprehension skills.

Threats to Validity and Reliability

Threats to the validity and reliability of the DIBELS and MAP assessments do exist. Similar threats to validity and reliability have been noted in similar research studies by other researchers.

The sample population size was one threat to this study because it only contained twenty-three students, which is relatively small. The population itself was not diverse enough in range of abilities as they all fell within an average to low average reading range. Also, the population chosen for this study was a convenience sample due to the accessibility and proximity of the group to the researcher. Using a convenience sample limits the findings, causing the researcher

to make a generalization about the entire population. This results in a low external validity for the study because the sample population cannot speak for the entire population, and the results determined in a smaller scale might not hold true for the entire population.

Another threat to the validity and reliability of this study were the findings themselves. The researcher has to take into consideration the testing history, which occurred during three testing intervals—fall, winter, and spring—and some outside events may have occurred between these tests that could have affected the results. The fall and spring testing intervals showed a significant relationship between fluency and comprehension, while the winter testing interval did not. It needs to be considered that between the fall to winter testing sessions and winter to spring sessions, the results could have been inconclusive due to interruption to instruction due to weather causing delayed starts or days off due to snow. Additionally, during the winter interval, a holiday break gives the students about two weeks away from instruction and practice. These factors can affect the validity and reliability of the results.

Other concerns arose during the implementation of the DIBELS and MAP assessments that could pose threats to the validity and reliability of the assessments. The concerns noted during the research study have also been identified by other researchers using the DIBELS or MAP assessments in similar studies that looked at fluency and comprehension. In a review of DIBELS written by Brunsmann and Shanahan (2005), published in the sixteenth *Buros Mental Measurement Yearbook*, they stated the scoring is complicated and slightly subjective to the examiner and due to the test being an assessment given multiple times during the year, error with validity and reliability could be a result of students having different examiners each time the test is administered. The concern with this is that the examination could be inconsistent. Other factors that could affect the validity and reliability of the test results are lack of rapport with the

test examiner and test anxiety due to the time restriction set upon the test. According to a report written in 2004, the Northwest Evaluation Association (NWEA) explained that one of the limiting features of the MAP test is that the test is designed to tailor itself to meet the student's abilities as he or she responds to questions. The more he or she gets right, the harder the questions and higher the skill level, and the more he or she gets wrong, the easier the questions become, and the skill level is lowered. This means that the test relies on the attentiveness and accuracy of student responses. Other concerns that can be associated with the validity and reliability of the MAP test are that students could have test anxiety due to sitting in a computer lab and seeing their peers around them finish before they do. The test is not given a specific time limit; however, the reliability and validity of the results could be affected by the rate at which a student clicks through the test. This could mean they are not thoroughly reading the content, could be guessing since the test is multiple choice, or become distracted, as there is no examiner facilitating the test. They are left to examine themselves by way of prompts and questioning on the screen. It was noted during the current research study that some students did take their time while testing and logged a reasonable amount of time to take the test, while other students clicked through questions at a rapid speed and finished in mere minutes after beginning the assessment.

Connections to Previous Studies

The results of this study during the fall and spring testing intervals, which supported a significant relationship between oral reading fluency and comprehension, support the findings of other research studies. The National Assessment of Educational Process (NAEP) found a close relationship between fluency and comprehension (Armbruster et al., 2011). A representative sample of the nation's fourth grade students who scored low on fluency measures also scored

low on comprehension measures (Armbruster et al., 2011). Cohen et al. (2009) measured text structure and retelling abilities in order to make a comparison between fluency and reading comprehension. The researchers showed a similar pattern between fluency and comprehension among third grade readers and adults. They concluded there was a relationship between the two variables, fluency and comprehension.

Another study by Jenkins, Fuchs, van de Brock, Espin, and Deno (2003) confirmed a strong relationship between the speed of word reading for oral reading fluency and comprehension of text and found data to support a relationship of context-free and context fluency and comprehension. The findings were that context-speed uniquely predicted comprehension whereas list speed did not (41% vs.1%). Also, a similar pattern existed when word reading fluency was scaled as time rather than speed (Jenkins et al., 2003). The findings show comprehension was better accounted for by context times rather than by list times (29% vs. 4%). Jenkins et al. concluded dysfluent reading interferes with comprehension processing and meaning of text is lost if individuals cannot read fluently.

Recommendations for Future Research

The limitations or threats to validity and reliability should be considered when determining a plan for future research. One suggestion for future research would include expanding the population group beyond twenty-three second grade students. This could include using the entire group of second grade students from one school or could include pulling sample populations of second grade students from other school locations. For future research it may be beneficial for the sample population to include more than second graders and be expanded across many grade levels, again within one school or from a variety of school locations. By expanding the sample size, it would allow for more opportunity to do a random sampling versus a

convenience sample. It also allows for more data to be collected, analyzed, and compared, which may help to give better insight to the relationship between fluency and comprehension.

If the sample size is expanded to multiple grade levels, the measures used for future research may need to be reconsidered. It would be important to make sure the measures selected are applicable for all participants and grade levels. For example, if future research was to continue with elementary students in Baltimore County Public Schools and sample populations were pulled to include students in fourth and fifth grade, DIBELS would not be able to be considered. Even though it is written for grades kindergarten- sixth, the DIBELS assessment was not administered past third grade. This may only be true for the school where the current study was conducted or could be true of all Baltimore County Public Elementary Schools. The MAP assessment, however, does expand across all grade levels and could still be used.

Another suggestion for future research would be to eliminate the time restrictions on oral reading fluency assessments to see if young readers perform better with their reading skills when not restricted to a one minute time frame like they are on DIBELS. This would be beneficial because it may allow the reader to feel more relaxed while reading, make fewer mistakes, and give a clearer perspective as to their skill level. Also, since the other measure in this study, MAP, did not have a time limit assigned to the test, it would make the two assessments more compatible in their delivery, even though some differences would still occur.

Finally, another recommendation for future research would be to extend the length of time the study is conducted. This study was conducted over the span of one school year but only occurred during three testing intervals: fall, winter, and spring. Each of the assessments was given on two separate dates during each of the testing intervals. Though a lot of information was gained from these testing intervals, this study could have benefited from collecting data about

fluency and comprehension between the testing intervals. This could be done by using the DIBELS progress monitoring assessments and a classroom intervention plan to measure and track comprehension. The data collected during MAP testing intervals is designed to help the classroom teacher develop an intervention plan to facilitate and monitor student growth in comprehension as MAP does not offer a specific progress monitoring assessment.

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