

The Relationship Between Fluency and Comprehension in Second Grade Students

by

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Abstract

The purpose of this study was to examine the relationship between reading fluency and reading comprehension and to determine if a student's reading fluency rate has an impact on their ability to comprehend. The correlational study was conducted with 20 second graders from four separate classes. The measurement tool used to assess fluency was the Oral Reading Fluency portion of Dynamic Indicators of Basic Early Literacy Skills (DIBELS). The measurement tool used to assess comprehension was the Measures of Academic Progress (MAP). These measures were both administered during fall and winter intervals of the 2015-2016 school year. Prior to the winter assessments, students participated in an 8 week fluency intervention pull-out groups. Fall data showed a significant relationship between fluency and comprehension. However, winter data did not show a significant relationship even after students participated in fluency intervention groups. Research in this area should continue as the results of this study were conflicting.

CHAPTER I

INTRODUCTION

Overview

Researchers often discuss the components of effective reading instruction and literacy development. There have been discussions about learner characteristics, and literacy processes such as phonemic awareness and phonics, vocabulary, fluency, writing, and oral language development (Frey, 2011). It is difficult to think of literacy development without considering each of the components mentioned above. Each component plays a significant role in literacy development.

Educators charged with the task of developing students' early literacy skills are generally aware of the National Reading Panel's statement that the primary focus of reading comprehension is to gain meaning from text (National Reading Panel, 2000). Comprehension is also defined as readers constructing meaning as they interact with the text and use intentional thinking (Harris & Hodges, 1995). Consequently, skilled readers actively construct meaning as they read: they are self-motivated and self-directed; they monitor their own comprehension by questioning, reviewing, revising and rereading to enhance overall comprehension (Frey, 2011).

Unfortunately, students who struggle with any one of the components that make up literacy development, could have difficulty with reading comprehension. Reading fluency is one component of literacy instruction that has been researched in relation to how it impacts reading comprehension. Reading fluency includes accurate automatic word recognition, appropriate speed, and appropriate prosody (Applegate, Applegate, & Modla, 2009). The reading fluency component is not the only component responsible for reading comprehension; however, a

student's ability to read fluently does play a role in their ability to gain meaning from text (Pikulski & Chard, 2005).

Classroom instruction plays a significant role in a student's reading development. The National Reading Panel devoted a subsection of their 2000 report to teacher education and reading instruction. As teachers work to develop the various aspects of reading to support and develop a competent reader, readers must be sufficiently guided and allowed adequate practice and feedback in order to continuously develop. This study will focus on reading fluency and comprehension.

Statement of Problem

This study will examine the relationship between fluency and reading comprehension. The main goal is to decide if second grade students' fluency rates play a role in their reading comprehension abilities.

Hypothesis

The results of this study will indicate that there is no significant relationship between fluency as measured by the Dynamic Indicators of Basic Early Literacy Skills Oral Reading Fluency Assessment (DIBELS) and reading comprehension as measured by Measures of Academic Progress (MAP) for second grade students.

Operational Definitions

The independent variable in this study is the students' fluency rates. The participant's fluency rates will be measured using the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Oral Reading Fluency component. Three benchmark administrations of this assessment is administered individually to each student each year. It is administered in the fall, winter, and spring. Their progress will be measured by their performance on the DIBELS

Benchmark scores for each grade level are established in the DIBELS manual. The DIBELS Oral Reading Fluency Assessment (DORF) determines the amount of words the student is able to read within one minute. For a second grade student to meet the fall benchmark score, they must be reading 52 words per minute. By the winter administration, the benchmark score is 72 words per minutes. This study will focus on the fall and winter administrations of the measures.

The dependent variable in this study is the second grader's reading comprehension levels. The Measures of Academic Progress Reading Assessment will be utilized to measure their reading comprehension levels. The Northwest Evaluation Association (NWEA) publishes MAP. This assessment is administered to students within the Baltimore County Public School System three times per year. There is a fall, a winter and a spring administration. The portions of the assessment that will be used to measure students' comprehension levels for this study are the reading and language usage portion. MAP uses a Rasch unit (RIT) scale or an equal interval scale to measure individual test item difficulty values to estimate student achievement. The NWEA RIT Scale Norms provides status and growth norms for individual students. Anticipated growth rates for each student are based on national norms. The grade level benchmark RIT score for second graders at the beginning of the year is 174.7. The grade level benchmark RIT score for second graders in the middle of the year is 184.2. Exploring the fluency levels in relation to comprehension levels could possibly add the strategies used during instruction to help students to improve comprehension.

Chapter II

Literature Review

This literature review seeks to explore difficulties in reading comprehension at the second grade level. Additionally, it will delve into the topic of fluency as it relates to general reading comprehension. Section one will elaborate on the importance of having the ability to make meaning of text when reading independently. Essentially, it will explain the importance of becoming competent at reading comprehension. Section two will discuss components of a well-developed reading comprehension program and the skills students possess if they have grade level or beyond grade level reading comprehension skills. The third section will discuss factors that may inhibit students from having good reading comprehension skills. Finally, the fourth section will describe interventions used in educational settings to combat the problem of low reading comprehension/ low reading achievement.

The Importance of Reading Comprehension

The primary objective of reading comprehension in simplest terms is understanding written or printed text. Reading is the foundation for many skills in daily life. As toddlers, establishing a literacy foundation can begin at home when parents do things such as reading to their children, reciting nursery rhymes with them and establishing home libraries. As children grow older, literacy instruction continues at the preschool and elementary levels. Reading is essential for school success. It is especially important for success in English Language Arts. It is also necessary when reading to gain knowledge in content areas such as social studies, science, and health. Reading can be a gratifying activity when individuals choose to read at leisure by selecting reading materials of personal interest. Reading comprehension is necessary to conduct essential business of everyday life such as banking, making major purchases, and completing

tasks for employment. Reading comprehension has come to be viewed as the “essence of reading” (Durkin, 1993). It is essential not only to academic learning but to life- long learning.

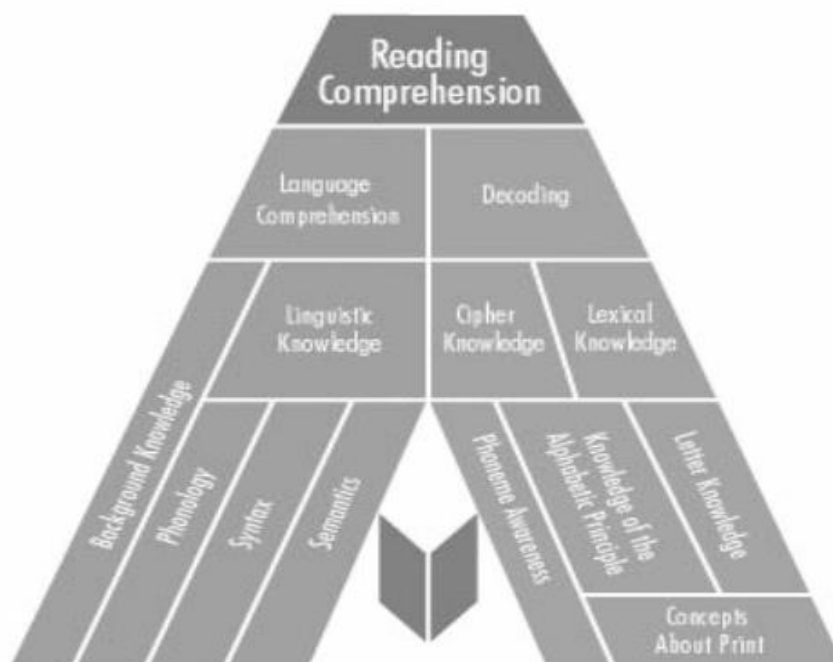
Unfortunately, children follow different routes to literacy growth. As noted above, some children begin the road to literacy at home during preschool years when they are read to by family members regularly. Other children are not regularly exposed to literacy activities until they are enrolled in school. While at school educators utilize instructional methods that attempt to provide literacy experiences similar to the experiences their peers had at home.

Reading comprehension is critical. It is a complex skill that requires the use of several processes simultaneously. As the National Reading Panel (2000) conducted its study concerning reading comprehension, three major themes emerged

- reading comprehension is a cognitive process that integrates complex skills and cannot be understood without examining the critical role of vocabulary learning and instruction and its development;
- active interactive strategic processes are critically necessary to the development of reading comprehension; and
- the preparation of teachers to best equip them to facilitate these complex processes is critical and intimately tied to the development of reading comprehension (p. 119).

First, it is important to explore the cognitive processes involved in reading comprehension. As literacy achievement ensues, students develop and coordinate “(a) orthographic, phonological, and morphological awareness of words and their parts that results in accurate and automatic reading of words from the Anglo-Saxon, Latinate, and Greek layers of the language; (b) vocabulary meaning, syntactic awareness, and discourse structures that

contribute to accurate and fluent reading and reading comprehension; and (c) interrelationships of reading with listening, speaking, and writing” (Berninger, 2004, p.1). Each of the process above are complex and requires teacher- led explicit guidance in order to be successfully acquired. Wren (2002) also displays the complexity of reading comprehension in his Framework of Cognitive Foundations of Learning to read. It is a clear visual of the many processes involved in developing reading comprehension.



Wren’s framework for reading comprehension includes language comprehension, decoding, background knowledge, phonology, syntax, semantics, cipher knowledge, lexical knowledge, phoneme awareness, letter knowledge, knowledge of alphabetic principal, concepts about print. Each of the components of Wren’s framework, play a role in developing students’ reading comprehension. It does not mean that comprehension only takes place if students possess all components of the framework. However, reading comprehension is a skill with many elements to support it. If students have deficits in any of the components included in Wren’s

framework, then a student's comprehension may not be at a high level.

Low reading achievement can impact students in many ways. For example, they may suffer from low self-esteem fearing the dreaded read aloud or round robin activities. They might struggle with home assignments and independent work. If root causes of poor reading comprehension are not identified in individual students, then it may have a negative impact on other areas of life as they grow into adulthood.

What does Good Reading Comprehension Look Like?

There has been much debate over the years about the strategies that work best when teaching students to become "good readers". The paradigm has shifted from phonics based instruction to whole word instruction to a syllable method and back again. It was once thought that if a student read fluently, then they were considered good readers. However, reading instruction has evolved quite a bit over the years. Research in reading is consistently evolving. In order to assist students at becoming efficient readers, parents and educators must deliver instruction using a variety of approaches.

The Nation Reading Panel (2000) devoted a portion of their report to teacher preparation and strategies instruction. "The idea behind the strategy approach to instruction is that reading comprehension can be improved by teaching students to use specific cognitive strategies or to reason strategically when they encounter barriers to comprehension as they read" (NRP, 2000, p.119). Instructing students to use one strategy at a time with modeling and guided practice may slightly improve achievement on reading comprehension tasks and teaching the use of a combination of strategies yielded similar results, improvement on comprehension tasks .

As important as strategy instruction is for a developing reader, The National Reading Panel (2000) also concluded that proficient reading involves so much more than utilizing

individual strategies. It involves a constant ongoing adaptation of many cognitive processes. Teachers must be skilled in their instructional practices in order to promote growth and development in reading. Just as competent readers utilize a myriad of skills, competent reading teachers must do the same. They must be responsive and flexible when attending to students' needs for instructive feedback while reading. They must take opportunities to provide instructive feedback to students as those opportunities become available. What this implies for teachers as they instruct students is that "they should help students by explaining fully what they are teaching: what to do, why, how, and when; by modeling their own thinking processes; by encouraging students to ask questions and discuss possible answers among themselves; and by keeping students engaged in their reading via providing tasks that demand active involvement" (p. 125). Consequently, teaching reading in general is not a simple task. It is a complex task that requires both the teacher and student to be active participants.

It is fair to say that students who comprehend well possess a set of distinct features. Reading Comprehension is somewhat like a puzzle. A student who comprehends well is an efficient or established reader. Typically an efficient reader has accurate and fluent word reading skills. They learn the alphabetic principal and concepts of print and they begin learning sight words. Efficient readers also set goals and note the structure and organization of text prior to reading (Paris, Wasik, & Turner, 1991). The skills required to be an efficient reader do not end there. Paris, et al. also conclude that efficient readers form mental records, summarize information and make, revise and check predictions while reading. In addition, efficient readers make inferences and use mental imagery. These skills work seamlessly and automatically as students interact with the text.

What Inhibits Good Comprehension?

Because reading is such a complex task, several aspects can result in a lack of good reading comprehension. Inhibitors of good reading comprehension can be difficult to determine. There are five major areas of reading. They are phonemic awareness, phonics, vocabulary, fluency and comprehension (Armbruster, Lehr & Osborn, 2003). Furthermore, phonemic awareness is necessary for the development of phonics; phonics is necessary for word recognition; word recognition is necessary for fluency, and fluency is necessary for reading comprehension (Eldredge, 2005). When creating profiles of students who lack reading comprehension at the grade level standard, many things could be included as inhibitors of good comprehension. Does the student lack phonemic awareness which may lead to difficulties in decoding and phonics development? If the student has difficulty decoding, does it impact his word identification skills? Is the problem poor word identification skills which would undoubtedly result in dysfluency? In addition to the areas noted above, we must also account for the students' interest or motivation level. Each of those areas impact reading comprehension. Each struggling reader is a like an elaborate riddle for a reading teacher to solve.

Literacy instruction follows a continuum of learning. The framework below exhibits an overview of cascading developmental stages and their instructional components. Berninger's (2004) framework includes some overlapping. Thus demonstrating the interrelated, complex nature of literacy acquisition. It is up to educators to determine where a student's deficit occurs and what interventions can be administered to attempt to help the student to achieve in reading.

First stage: Learning to read words and understand text
<ol style="list-style-type: none"> 1. Subword level: alphabetic principle, syllables, and morphemes 2. Word level: rule-governed decoding, word-specific representations, automatic word recognition 3. Text level: fluent oral reading, fluent silent reading, reading comprehension 4. Integration of reading with listening, speaking, and writing
Second stage: Reading to learn, enjoy, and work in school and nonschool settings
<ol style="list-style-type: none"> 1. Domain-specific content areas in school curriculum 2. Leisure time activities in and out of school 3. Everyday reading for functioning in society 4. Vocation-specific reading for functioning at work
Third stage: Executive coordination of reading and high-level functions
<ol style="list-style-type: none"> 1. Integration with technology (e.g., word processing systems, Web-based information systems) 2. Integration with thinking (e.g., critical thinking), mental world building (e.g., creative thinking), and problem solving

Fluency and Decoding

One skill that could interfere with adequate reading comprehension are lack of word automaticity or text fluency (Berninger, 2004). A greater interest in fluency became prevalent after the 2000 report by the National Reading Panel. The two key components that define fluency are “accurate and automatic word recognition and reading at an appropriate rate of speed” (Applegate, et al, 2009, p.512). Some theorists have added reading with appropriate prosody or expression to fluency’s definition. If readers have not developed automaticity in word recognition, then the efforts they must apply to decoding will almost certainly limit the efforts they can direct to comprehension. Over the years teachers have observed struggling readers painstakingly attempt to sound out words when reading a text. The result is often a very

dysfluent and frustrated student. Again, their cognitive abilities are consumed with decoding resulting in an inability to make meaning from the text.

Oral Language Skills and Vocabulary

There is research to suggest that “early oral language skills are influential in later reading achievement outcomes” (Wise, et al, 2007). However, there is also some debate surrounding that very statement. It has been disputed that the domains comprising language such as phonology, semantics and grammar may “influence the development of different reading achievement skills in a differential manner and at different developmental periods” (Vellutino, Scanlon, & Tanzman, 1994, p.279). Upon completion of the study of their relationships, it was concluded that vocabulary knowledge is related to reading comprehension performance and listening comprehension has an even stronger relationship with reading comprehension performance (Wise, Sevcik, Morris, & Lovett, 2007). Consequently, we can note the importance of early oral language skills as they relate to preparing students to become competent readers. Furthermore, since vocabulary knowledge is composed of stored phonological and semantic representations then vocabulary knowledge may aid in word identification (Levelt, Roelofs & Meyer, 1999). One conclusion made based upon this revelation includes students with smaller vocabularies possibly having difficulties identifying words because they do not have well- established, internalized phonological representations of words to map onto written words . Additionally, it is speculated that word meanings that are conceptually represented in more detail are easier to access in the lexicon because greater depth of vocabulary knowledge may reflect greater speed in encoding organizing and retrieving phonological representations of words (Ouellette, 2006). This leads to the conclusion that children with deeper vocabulary knowledge should be able to access and retrieve word specific phonological representations with more efficiency, which

should lead to greater word identification performance (Wise et. al, 2007). Keeping in mind that word identification is necessary for that fluency and fluency plays a role in reading comprehension then these aspects can certainly inhibit reading comprehension.

The research above supports the idea of the importance of vocabulary which has been recognized for many, many years. As cited by the National Reading Panel (2000), long ago, Whipple (1925) noted that “growth in reading power means continuous enriching and enlarging reading vocabulary and increasing clarity of discrimination in appreciation of word values (p. 15).” The National Reading Panel (2000) also cited Davis (1942) who presented evidence that “comprehension comprises two skills: word knowledge, vocabulary and reasoning” (p.4-3). The ideas focused on vocabulary are consistent with The National Reading Panel idea. The National Reading Panel Report notes that “vocabulary occupies an important middle ground in learning to read. National Reading Panel goes on to say that “oral vocabulary is key to learning to make the transition from oral to written form” and “reading vocabulary is crucial to the comprehension processes of a skilled reader” (p.4-3).

Working Memory

Working memory is important in all student’s academic careers. Studies over the years have found that reading comprehension substantially impacts on working memory (Cain, Oakhill, & Bryant, 2004). Swanson & O’Connor (2009) had three findings when investigating whether practice in reading fluency had a causal influence on the relationship between working memory and text comprehension. First, the influence of working memory on comprehending grade level text was not related to fluency (Swanson & O’Connor, 2009). This is interesting because teachers sometimes closely associate fluency with reading comprehension. Second, dysfluent readers who used continuous reading as a condition had higher post test scores than

dysfluent readers in other conditions such as repeated readings on measures of text comprehension but not on vocabulary. The third finding was individual differences in working memory better predicted post-test comprehension performance than word attack skills. Overall, in this particular study, “the results were interpreted within a model that viewed reading comprehension processes as competing for a limited supply of working memory resources that operate independent of fluency” (p.548).

Interventions for Reading Comprehension

Interventions in General

Educators are faced with new, different groups of students each year. They are faced with students who are exceptional in different ways. Some may be exceptionally gifted while others have literacy deficits. It seems as if the number of students with deficits is steadily increasing. The National Reading Panel’s (2000) goal was to determine how to get students reading at grade level standards by the third grade. Students with literacy deficits present a unique set of challenges for educators. Students may be learning disabled, at risk or they simply do not respond to traditional instructional methods. Educators are faced with designing or implementing interventions to help students achieve in reading. Interventions are necessary as a result of academic problems. Rathvon (2004) states that academic problems may be characterized in several ways including skill deficits, fluency deficits, performance deficits or some combination of the three. Rathvon goes on to describe the academic problems. Skill deficits refer to deficiencies with previously taught skills. Fluency deficits refers to the rate at which skills are performed accurately. According to Rathvon, students with “performance deficits possess adequate skills and fluency but do not produce work of satisfactory quantity,

quality or both” (p. 2). Interventions can be administered in a variety of ways. Intervention strategies include self-management, class-wide peer tutoring, listening previewing, or collaborative strategic reading to name a few. Rathvon explains various interventions.

Self-management means that students set goals for work completion and/ or accuracy and they monitor their own progress. Class-wide peer tutoring involves practicing skills and reading in pairs. Listening previewing requires students to read a passage aloud after listening to a proficient reader read the same passage. With collaborative strategic reading, students learn four basic reading strategies and then work in pairs or groups to implement the strategies (Rathvan, 2004, p.2).

Interventions can use a case centered teacher consultation, small group or classroom centered teacher consultation, staff development programs, or intervention assistance programs (Rathvon, 2004). Educators are faced with designing or implementing interventions to help students achieve in reading. Rathvon recommends that “as educators attempt to design interventions for students, they must consider the importance of balancing treatment, efficacy with usability considerations to accommodate the reality of today’s classrooms” (p.5).

Fluency

Reading fluency has been the subject of research and debate for quite some time. A student must have competent word identification skills in order to read fluently. However, word recognition skills do not automatically lead to fluency. Rasinski (2006) refers to three major components of fluency. They are accuracy (reading words correctly), rate (the reader’s speed), and prosody (expression, stress, intonation, and pausing). Although there are programs that focus on fluency, fluency itself cannot be considered a reading program on its own. Hudson, Lane, & Pullen (2005) states that it should be “part of a comprehensive reading program that

emphasizes both research based practices and reading for meaning” (p.702). Their statement certainly fits with the National Reading Panel’s (2000) description of a comprehensive reading program which includes fluency as a necessary component. Snow, Burns, & Griffin (1998) say that adequate progress in learning to read any alphabetic language beyond the initial level depends on sufficient practice in reading to attain fluency with various texts. They also recommended regularly assessing the development of word recognition and reading fluency since they both are necessary in order to gain meaning from print. This allows for timely and effective instructional response when difficulty or delay is apparent.

There are many ways to develop reading fluency. Modeling is essential. Students must see and hear models of fluent reading in order to understand the expectation of fluency. The National Reading Panel (2000) found that repeated reading improved overall fluency and reading achievement as well as comprehension (Armbruster, et al., 2003).

One drawback of repeated reading is that students may not be exposed to a broad range of words because of the amount of time spent repeatedly reading one text. They might even find repeated readings boring and not give it the full effort necessary to improve fluency.

A few activities that can be conducted to improve reading fluency include poetry reading, reader’s theater, choral reading or partner reading. In one 2008 study, it was concluded that students using rhyming poetry during fluency practice made an average gain of 26 words correct per minute on grade level passages (Rasinski, Rupley, & Nichols, 2008). Reader’s Theater involves students rehearsing and performing a play for peers or others. Readers Theater is also a great opportunity for student collaboration. In choral reading students read along as a group with a teacher or another fluent adult reader. Partner reading involves pairing students up to take turns reading aloud to each other. For partner reading, more fluent readers can be paired with less

fluent readers.

Phonics and Decoding

There has been much debate over systematic phonics based instruction and if it is more effective than other forms of instruction. If it is determined that decoding is significantly impacting a student's ability to comprehend text, then an educator could choose to implement some type of phonics instruction to help the student to achieve in reading. Teaching students good word attack skills is key. The National Reading Panel (2000) states that in order to read well readers must be able to apply alphabetic knowledge to decode unfamiliar words. They must also remember how to read the words that they have read before.

There are several different approaches to teaching phonics systematically and explicitly. The approaches include synthetic phonics, analytic phonics, analogy phonics and onset- rime phonics, and phonics through spelling. Synthetic phonics programs teach students to convert letters into sounds or phonemes and then blend the sounds into recognizable words (NRP, 2000). This is typical of a primary class during daily phonics instruction. Analytic phonics actually avoids having children pronounce sounds in isolation to figure out words. Instead, students analyze letter sound relationships once words are identified. In spelling programs children learn to transform sounds into letters to write words. Phonics in context approaches teach children to use sound- letter correspondences in conjunction with context cues to identify unfamiliar words in the text. Analogy phonics programs teach children to use parts of written words that they know to help decode new words. Each of these approaches are somewhat different. However the one major similarity of systematic phonics programs is that they delineate a planned, sequential set of phonic elements and they teach these elements in an explicit systematic manner. With phonics instruction and phonics interventions, the primary goal is to help students gain

adequate knowledge and use of alphabetic code in order to make progress learning to read and comprehending text.

Summary

Reading comprehension is key to success in academic and daily life. It is an extremely complex process involving many cognitive activities. Unfortunately, there can be deficits in different cognitive areas that inhibit reading achievement and impact the ability to comprehend text. These inhibitors include the lack of decoding or word attack skills, dysfluency, and limited working memory to name a few. Educators are faced with providing interventions to help students to improve their reading comprehension abilities. Choosing appropriate interventions can be key to helping students achieve in this important lifelong skill.

CHAPTER III

METHODS

The purpose of this research study was to determine the relationship between reading fluency and reading comprehension of second grade students.

Design

The design of this study is correlational. The correlational study allowed for the examination of the relationship between reading fluency and reading comprehension in second grade students. Second graders in this study completed two measures. One measure assessed their reading fluency rates. The other measure measured their reading comprehension levels. The measures were administered in the fall (September) and again in the winter (January). Participants in the study engaged in an eight week pull out, fluency intervention group and regular classroom instruction between the administrations of the measures. The results of both measures were analyzed to determine if a relationship exists between fluency and comprehension,

Participants

The participants in this study attend a public elementary school in the northwest area of Baltimore County in the Baltimore County Public School System located in Maryland. The school is the employment site of the researcher. The participants chosen to be part of this study were members of the researcher's second grade reading intervention groups. The participants in this study ranged from low average to average reading ability.

The sample population included 12 boys and 8 girls. The demographic breakdown of the sample population consists of 58% African American, 30% Hispanic, 2% Indian, 5% Caucasian, and 5% biracial. There were no other ethnicities represented in this particular study. A convenience sample was taken from four of the six second grade classes in this elementary

school.

Instruments

This study used two instruments. The Oral Reading Fluency portion of Dynamic Indicators of Basic Early Literacy Skills, (Sixth Edition) DIBELS was the first measure. DIBELS Oral Reading Fluency subtest was used to measure students Oral reading fluency rates. The DIBELS ORF enables test administrators to determine how many words a student is able to read per minute. Fluency rates are divided into three categories: at risk (strategic), some risk (intensive), and low risk (core). For the beginning of the year at the second grade level, an oral reading fluency score of 27 or fewer correct words read per minute is considered “at risk.” This is an intensive range and students in this range require substantial intervention. A score between 28 and 40 correct words read per minute is defined as “some risk. Students in this strategic range require additional intervention.” An oral fluency score of 41 or above is indicate “low risk.” They have met or exceeded the core benchmark score for this point in the year. For the middle of the year at the second grade level, an oral reading fluency score of 54 or fewer correct words read per minute is considered “at risk.” A score between 55 and 75 correct words read per minute is defined as “some risk,” and an oral fluency score of 76 or above is “low risk.” According to the Buros Mental Measurement Yearbook (2003),

DIBELS Oral Reading Fluency (ORF) measures showed remarkable levels of reliability given the brief nature of the test. The DIBELS ORF (alternate form: .92, and test-retest: .92-.97) showed the most evidence of reliability. Similarly, it had strong predictive and concurrent validity evidence when compared to the Woodcock-Johnson Reading Tests and other measures. The average concurrent validity coefficients (correlations with other measures taken at the same time) was .80 for ORF. The predictive validity coefficients

was .66 for ORF.

The second measure used to assess reading comprehension achievement was the Measures of Academic Progress Assessment (MAP). Three types of reliability evidence are reported in reference to MAP. They are marginal reliability, test retest reliability, and standard errors of measurement. The measurement scales have not increased by more than 0.01 standard deviations over the twenty five years that MAP has been used (NWEA, 2005). Additionally, across all grades and subjects, stability estimates were never lower than .77. According to the Cizek and Alves, it appears as if users can have confidence in the reliability of MAP scores. Cizek reviewed MAP in Buros' Mental Measurement Yearbook (2011). His findings include the fact that comprehensive test development and administration procedures and documentation support conclusions that MAP scores differentiate between students' levels of ability in tested subjects. He goes on to say that "the manner in which the goals and objectives for each test are developed promotes a high degree of alignment between the curriculum and the test content" (NWEA, 2005a, p. 52). The primary source of MAP validity evidence was derived from correlation between NWEA's other series the ALT assessment and other measures (Iowa Test of Basic Skills –ITBS and the Ninth Edition of Stanford Achievement Test-SAT9). The correlations range from .77 to .84 revealing that the ALT scores in Reading, Mathematics and Language are fairly strongly related to the scores on the ITBS and SAT9. Concurrent validity coefficients ranged from .77 to .88. Similar results were derived when correlated with state level assessments in Wyoming, Colorado, Indiana, and Washington. Alves, supported the validity findings with data from the MAP technical manual. The average correlation for Reading was .85, Language and Language Usage was .81, and Mathematics was .85. Overall, MAP is a reliable and valid assessment.

Procedure

The design of this study was OXO. All students in the Baltimore County Public School System were assessed in both Math and Reading using the Measure of Academic Progress Assessment. The participants in this study completed the assessment with their peers in September, 2015. Measures of Academic Progress was administered in the computer lab. Each student completed it independently on desktop computers. They logged onto the test session and followed the instructions that were given. The researcher was present in the room as a proctor while the regular classroom teacher acted as test administrator. They both monitored as students completed the computerized, adaptive assessment. The researcher collected the results of this assessment to include as pretest data in this study.

Students were also individually assessed using the Sixth Edition of DIBELS Oral Reading Fluency Assessment. The researcher read the required script to inform each student of their expectation. Then she started a stopwatch just as the student started orally reading the first benchmark selection, “Mom’s New Job”. The teacher followed along with the student and made note of all errors stopping when one minute had passes on the stopwatch. The researcher then calculated how many words were read per minute on the selection. The researcher repeated the procedure for the two remaining benchmark selections, “My Handprints” and “Meals on Wheels”. Finally, the researcher recorded the median score as the pretest score for each participant in this study.

Students were recommended by their classroom teachers to be part of the researchers pull out reading intervention group. The teachers’ recommended students based on assessment data and/ or classroom performance in reading. The focus of the intervention group was reading fluency. The treatment used in during the four days per week 30 minute pull out sessions were

repeated readings and choral reading using fluency passages that were leveled by grade. Students were picked up from their regular classrooms and escorted by the researcher to the reading resource room. Each session followed the same routine. Students entered the room and took a seat at the small group kidney table. First, the researcher introduced the text for the week and modeled fluent reading by using phrasing and the scooping method. After modeling, students participated by reading the same text chorally. Students read chorally with scooping and feedback multiple times. Finally, students read the text with a partner while the researcher listened in. During partner reading, they timed themselves for 1 minute and recorded how many words per minute was read on their individual fluency rate bar graphs.

The overall goal of the sessions was to provide time for guided fluency practice. At the end of the eight week period, students were administered the winter benchmark of the DIBELS oral reading fluency as well as the winter benchmark of MAP to determine whether or not a relationship between fluency rates and reading comprehension actually exists.

CHAPTER IV

RESULTS

This study examines the relationship between reading fluency and reading comprehension for 20 second grade students. The study used two instruments. The first instrument was the Oral Reading Fluency (ORF) portion of the Dynamic Indicators of Basic Early Literacy Skills, Sixth Edition (DIBELS). The second instrument was the Measures of Academic Progress Assessment (MAP). Student DIBELS' ORF and MAP scores determined if a significant correlation exists between reading fluency and comprehension for second graders. The results of the analyses are presented in tables 1 through 6.

Descriptive Statistics and At-Risk Categories

Table 1

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

Measure	Mean	Standard Deviation
Fall DIBELS ORF	34.2	12.50095
Winter DIBELS ORF	45.7	14.6219
Fall MAP	169.15	9.493904
Winter MAP	179.4	15.9585

Mean scores were higher at the winter testing than at the fall testing for reading fluency (DIBELS) and comprehension (MAP).

Further Analysis Using Cross Tabulations of Risk Levels

Table 2

Risk Levels of Fluency, Fall Compared with Winter ORF

RECODE of Fall ORF	RECODE of Winter ORF		Total
	At Risk	Some Risk	
At risk	6 100.00	0 0.00	6 100.00
Some risk	5 71.43	2 28.57	7 100.00
Low risk	3 42.86	4 57.14	7 100.00
total	14 70.00	6 30.00	20 100.00
Pearson chi2(2) = 5.0340 Pr =0.081			

Students at higher risk in the fall tended to be at higher risk in the winter. The relationship between fall and winter fluency levels was close to statistical significance at the 0.05 level ($p=0.081$).

Table 3

Risk Levels of Comprehension, Fall Compared With Winter

RECODE of Fall MAP	RECODE of Winter MAP		Total
	Below Benchmark	Made Benchmark	
Below Benchmark	11 84.62	2 15.38	13 100.00
Made Benchmark	2 28.57	5 71.43	7 100.00
	5		
total	13 65.00	7 35.00	20 100.00
Pearson chi2(1) = 6.2819 Pr =0.012			

Being below benchmark in the fall was highly predictive of being below benchmark in the winter. The relationship between fall and winter comprehension benchmark levels was statistically significant ($p=0.012$).

Table 4

Fall Fluency Risk Levels Compared with Fall Comprehension Risk Levels

RECODE of Fall ORF	RECODE of Fall MAP		Total
	Below Benchmark	Made Benchmark	
At risk	6 100.00	0 0.00	6 100.00
Some risk	2 28.57 5	5 71.43	7 100.00
Low risk	5 71.43	2 28.57	7 100.00
total	13 65.00	7 35.00	20 100.00
Pearson $\chi^2(2) = 7.4411$ Pr =0.024			

Fall fluency risk levels were significantly related to fall comprehension benchmark levels at the 0.05 level ($p=0.024$).

Table 5

Winter Fluency Risk Levels Compared with Winter Comprehension Risk Levels

RECODE of Winter ORF	RECODE of Winter MAP		Total
	Below Benchmark	Made Benchmark	
At risk	9 64.29	5 35.71	14 100.00
Some Risk	4 66.67	2 33.33	6 100.00
Total	13 65.00	7 35.00	20 100.00
Pearson $\chi^2(1) = 0.0105$ Pr =0.919			

Winter fluency risk levels were not significantly related to winter comprehension benchmark levels at the 0.05 level ($p=0.919$).

Table 6

Fall Fluency Risk Levels Compared with Winter Comprehension Risk Levels

RECODE of Fall ORF (Fall ORF)	RECODE of Winter MAP (Winter MAP)		Total
	Below Benchmark	Made Benchmark	
At risk	4 66.67	2 33.33	6 100.00
Some Risk	3 42.86	4 57.14	7 100.00
Low Risk	6 85.72	1 14.29	7 100.00
Total	13 65.00	7 35.00	20 100.00
Pearson $\chi^2(2) = 2.8362$ Pr =0.242			

Fall fluency risk levels were not significantly related to winter comprehension benchmark levels at the 0.05 significance level ($p=0.242$). At both high and low fluency risk, the majority of students were below benchmark in winter comprehension.

Overall, it is important to note that the researcher's focus on the DIBELS "at risk" and MAP "below benchmark" categories led to conflicting findings. In fall, fluency and comprehension were significantly related and in winter fluency and comprehension levels were not significantly related as noted by the data represented in tables 2 through 6.

CHAPTER 5

DISCUSSION

The purpose of this research study was to determine the relationship between reading fluency rates and reading comprehension levels of 20 second grade students. Data was collected from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) sixth edition, oral reading fluency subtest and the Measures of Academic Progress (MAP) Reading Assessment.

The tests were administered in the fall and winter. In relation to my null hypothesis, the data from the two administrations of MAP and DIBELS gave different results. When comparing fall fluency with fall comprehension the relationship was statistically significant (Chi-square = 7.44, $p = 0.024$). The results reject null hypothesis of no relationship between fluency and comprehension. However, when comparing winter fluency with winter comprehension results this relation was not statistically significant (Chi-square = 0.01, $p = 0.919$). The winter results do not reject the null hypothesis.

Implications of Result

The implications of the results from this study are particularly important to literacy teachers. The results offer insight as teachers plan and implement a well-rounded literacy block. The results concerning correlation between fall fluency and fall comprehension scores were different than the results concerning correlation between winter fluency and winter comprehension scores. As stated in the previous section, there *was* statistical significance in the fall supporting the idea that there is a correlation between fluency and comprehension. The implication for educators in this case would be that they should include a fluency component to their literacy instruction in order to support achievement in comprehension. Conversely, the winter results did not reveal a statistical significant correlation between fluency and comprehension even after providing extra

support and intervention in fluency. The winter outcome was perplexing and required much thought surrounding possible causes for the results indicating no relationship between fluency and comprehension. However, for this particular study, the fluency intervention was unsuccessful and did not indicate a relationship between fluency and comprehension. Even though the winter results supported the null hypothesis, educational literature consistently includes fluency as an important component of a well-rounded literacy program indicating a relationship between fluency and comprehension. The National Reading Panel itself discussed several studies. One in particular found a close relationship between reading fluency and comprehension (NRP, 2000). This study and others led them to the idea that adequate progress in learning to read depends on sufficient practice in reading to achieve fluency of different texts. Basically, the National Reading Panel reports that students who are low in fluency may have difficulty getting meaning from what they read. These ideas noted by the National Reading Panel, support the need for consistent fluency practice as a component of a regular literacy program in educational environments. Additionally, they recommend frequent assessment of word recognition because it is a large component of fluent reading. They recommend frequent assessments in reading fluency so that effective instructional responses can take place when difficulties or delays arise.

While examining the results from DIBELS and MAP for participants of this study and other educators using these measures can prove helpful. The DIBELS results are helpful in providing valuable information concerning the risk levels that students are grouped into after being assessed. Students were grouped into “at risk”, “some risk”, and “low risk”. Understanding the risk categories enables teachers to provide appropriate levels of instructional support. In the case of MAP, students either meet the benchmark RIT score or they do not meet the RIT benchmark

scores. Additionally, they are ranked high, high average, low average, or low. This information enables educators to place students into appropriate small groups. Using the data provided allows teachers to use instructional time focusing on the skills that the student need. Students in the “at risk” category for ORF need more substantial fluency instruction/practice. These students would be recommended for extra support from a reading specialist or literacy coach. In this study, in the fall, six students were at risk on DIBELS and below benchmark on MAP. Students falling in both categories simultaneously would need intensive intervention. In the winter, there were fourteen students who were in the “at risk” category for ORF and nine of them scored below benchmark in comprehension on MAP. These students should receive strategic intervention as well. Many factors may have contributed to the number of students “at risk and “below benchmark.” Possible causes for fluency and comprehension showing no relationship after the fluency intervention will be explored further. Another implication for educators would be that if they solely focus on the winter results, they may neglect to provide appropriate instruction in fluency. This would be a dis-service to students considering overwhelming research in support of fluency’s impact on comprehension.

Threats to Validity

There were some threats to the validity of this study. First, the sample population consisted of only twenty students. Twenty participants was somewhat small. Additionally, the sample population was a convenience sample simply because the students were easily accessible to the researcher. Unfortunately, convenience samples do not produce representative results. Researchers often make sweeping statements about an entire population based on convenience samples. The results of a small group may not apply to an entire population.

Another threat included the diversity of the participants. The study included 50% African American participants but other participants were under- represented. There were 30% participants that were ESL (English as a Second Language) learners. These students had the added pressure of learning and attempting to master the nuances of the English language while also working to improve fluency and comprehension.

Data was collected in September and in January. Between the two administration sessions, an eight week pull out fluency group was implemented in addition to the participants' regular classroom instruction. Several of the students who participated in the study were new to the elementary school where the study took place. Consequently, they were adjusting to a new school community. This may have affected the comfort level of the participants during group sessions. Additionally, during the eight weeks, study sessions had to be cancelled when the researcher was unexpectedly called to attend to other responsibilities during scheduled intervention times. Unfortunately, the students' classroom teachers were not flexible in allowing students to participate in make- up sessions. This affected the success that may have been gained from consistent intervention time.

One final threat may have been the temperament and behavior of the participants themselves. At least three students had frequent absences. At least two were referred to the Student Support Team because teachers had concerns about their attention and or behavior that effected their classroom performance. These threats to validity were substantial when considering the correlation between fluency and comprehension with this particular study.

Connections to Previous Studies

The results of this study show similarities to a study conducted on a much larger scale with 305 participants. The study researched the relationship between different measures of oral

reading fluency and reading comprehension in second grade students who evidence different oral reading fluency difficulty. The difficulties were in the areas of nonsense word oral reading fluency, real word oral reading fluency, and oral reading fluency of connected text. The results of this study indicated that real world oral reading fluency was the strongest predictor of reading comprehension performance (Wise, et al, 2010). These results support the results of the fall “at risk” data collected during this current study. Fall data was collected in September as students were returning from summer vacation having no regular reading instruction. It is possible that they regularly engaged in “real world reading during their summer break.

Another study had participants work in reading fluency intervention groups for up to eleven weeks (Begeny & Martins, 2006). The participants of the current study participated in group based fluency intervention for 8 weeks. The findings of the study suggest that students who participated in group- based reading fluency intervention improved students oral reading fluency intervention improved students oral reading fluency of trained passages when compared to practice used in their regular classroom. The study also revealed that group based intervention increased students’ reading comprehension of practiced material when compared to regular classroom conditions. The results from this study led the researcher to reject the null hypothesis established prior to conducting the study.

Implications for Future Research

This study resulted in conflicting results for the fall and for the spring when focusing on the “risk categories”. In the fall, the data reflected a relationship between fluency and comprehension. However, in the winter the data reflected no significant relationship between fluency and comprehension. The limitations or threats to validity will make a major difference when planning future research. First, it would be beneficial to use a more random population

instead of one chosen out of convenience. Expanding the participants to include multiple grade levels, multiple schools and more diverse ethnicities might provide consistent, more accurate results.

In addition to the type of sample chosen, consistency when conducting intervention groups is key. There were many negative factors that affected the consistency of the intervention groups prior to the winter DIBELS and MAP benchmark assessments. Consistency of any intervention is necessary when the ultimate goal is student growth. The lack of consistency in this case played a role in the winter results that fluency and comprehension did not have a significant relationship.

One final recommendation for future research would be to extend the study so that data could be collected for a longer period of time. DIBELS and MAP are both administered for fall, winter and spring benchmark intervals. The spring benchmark should also be included in the results of future studies. Extending the study to include spring data, would enable the researcher to gain a well-rounded picture and possibly different results concerning the relationship between fluency and comprehension.

Summary

The results of this study were conflicting. The fall results rejected the null hypothesis that there is no relationship between fluency as measured by DIBELS and comprehension as measured by MAP. However, the winter results supported the null hypothesis. The researcher notes several limitations that may have contributed to support of the null hypothesis. There are many studies that support a relationship between fluency and comprehension. Consequently, the researcher suggests that educators continue to implement fluency interventions to students who struggle with reading fluency. The researcher also suggests including regular fluency practice as

part of their overall instruction in reading.

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