7-15-2015

The Effects of Performance Feedback on Oral Reading Fluency

Jill Marie Little
Indiana University of Pennsylvania

Follow this and additional works at: http://knowledge.library.iup.edu/etd

Recommended Citation

Little, Jill Marie, "The Effects of Performance Feedback on Oral Reading Fluency" (2015). *Theses and Dissertations (All)*. 981.
http://knowledge.library.iup.edu/etd/981

THE EFFECTS OF PERFORMANCE FEEDBACK ON ORAL READING FLUENCY

A Dissertation

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Education

Jill Marie Little

Indiana University of Pennsylvania

May 2015

Indiana University of Pennsylvania
School of Graduate Studies and Research
Department of Educational and School Psychology

We hereby approve the dissertation of

Jill Marie Little

Candidate for the degree of Doctor of Education

_____   _____
                                                Joseph F. Kovaleski, D.Ed.
                                                Professor of Educational and School Psychology, Chair

_____   _____
                                                Mark J. Staszkiewicz, D.Ed.
                                                Professor of Educational and School Psychology

_____   _____
                                                Timothy Runge, Ph.D.
                                                Associate Professor of Educational and School Psychology

_____   _____
                                                Becky A. Knickelbein, Ed.D.
                                                Associate Professor of Communication Disorders, Special Education, and Disability Services

ACCEPTED

_____   _____
Randy L. Martin, Ph.D.
Dean
School of Graduate Studies and Research

Title: The Effects of Performance Feedback on Oral Reading Fluency

Author: Jill Marie Little

Dissertation Chair: Dr. Joseph F. Kovaleski

Dissertation Committee Members: Dr. Mark J. Staszkiewicz
                                   Dr. Timothy Runge
                                   Dr. Becky A. Knickelbein

The purpose of this study was to determine the effect of four performance feedback conditions on the rate of improvement (ROI) and the final level of words correct per minute using a curriculum-based measure. The sample size consisted of 50 second-grade subjects who were administered oral reading fluency probes twice weekly for eight consecutive weeks. The second-grade subjects were randomly assigned to a feedback group where they were provided verbal performance feedback on either the number of errors read, the number of words read correctly, both the number of errors read and words read correctly, or no feedback was provided. Results showed a significant effect was found for the provision of errors on the dependent variable of ROI in that errors significantly decreased acceleration when compared to conditions in which errors were not provided. No significant results were found for the other feedback groups for either of the dependent variables.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Recent educational laws, regulations, studies, and reports have called on educators to improve reading skills for all student learners. One reading skill essential to comprehension is reading fluency, which has been identified as a critical component central to the development of overall reading skills and an important influence on reading instruction and curriculum development (Kuhn, Schwanenflugel, & Meisinger, 2010). Reading fluency is the speed and ease in which students can read text (Hosp & MacConnell, 2008). The focus on reading fluency increased in 2000 when the National Reading Panel identified reading fluency as a major reading component necessary for academic reading growth (National Institute of Child Health and Human Development, 2000). The National Reading Panel recognized reading fluency to be of major importance due to its contribution to word recognition and reading comprehension skill development and growth. Reading fluency not only involves speed but also includes reading with accuracy and expression (Shaywitz & Shaywitz, 2004). Reading fluency has also been long recognized as an important factor for vocabulary skill development, which, in turn, influences the development of comprehension skills (Spear-Swerling, 2006).

Reading fluency not only influences the development of other reading components but also influences high-stakes assessment performance and high school graduation rates. Addressing the development of oral reading fluency during early elementary years has a positive effect on later high-stakes testing performance (Baker et al., 2008). Reschly, Busch, Betts, Deno, and Long (2009) found that the method of making instructional changes based on results from tracking oral reading fluency skills allows students an opportunity to improve oral reading fluency skills prior to participating in high-stakes assessments. Likewise, early detection and

1

remediation of oral reading fluency skills may reduce the number of students at risk for not completing high school. Balfanz, Bridgeland, Bruce, and Fox (2013) found that the likelihood of students dropping out is reduced when students are able to demonstrate reading proficiency at grade level. The authors also found that students who cannot read at grade level by third grade are four times more likely to not finish high school. Therefore, because reading fluency is a central component to overall reading proficiency, it is critical that reading fluency is addressed early in the elementary years so that students can increase successful academic and career outcomes.

Because the development of reading fluency has long-term effects on academic success, identification and remediation of these skills has become an important focus in the educational setting. Legislation has centered on increasing early reading skills, including oral reading fluency. The No Child Left Behind Act (NCLB, 2002) emphasized academic improvement for early reading skills and the use of high-quality assessments and scientifically-based instructional methods to improve reading skills. The Individuals with Disabilities Education Improvement Act (IDEIA) of 2004 stated that the regular classroom reading instruction must include the essential components of reading before a student is identified with a specific learning disability.

Given the importance of reading fluency, a large portion of reading research has been conducted to determine the effectiveness of various oral reading fluency methods. The National Reading Panel (2000) identified methods such as repeated readings, neurological impress, radio reading, paired reading, silent reading, and incentive programs as primary methods for promoting oral reading fluency skills. Eckert, Ardoin, Daly, and Martens (2002) categorized oral reading fluency methods as either skill based (e.g., repeated readings) or performance based (e.g., performance feedback). The majority of studies investigating oral reading fluency has

been conducted using only skill-based oral reading fluency methods or has investigated skill-based oral reading fluency methods in conjunction with other skill-based or with performance-based methods. Available literature is limited regarding studies that have explored performance-based oral reading fluency strategies as stand-alone methods.

The methods of repeated reading and preview are two skill-based methods that have been frequently investigated as individual methods or paired with performance-based methods. The repeated reading method involves the reading of a specific passage several times aloud until an established criteria, such as designated amount of words read within a timeframe, is achieved (Welsch, 2006). Previewing (modeling) involves having a student read a passage aloud or silently or listen to others read a passage aloud prior to the student's instruction or assessment for the passage (Begeny, Krouse, Ross, & Mitchell, 2009).

The performance feedback method is considered a performance-based strategy that involves the provision of feedback data to influence oral reading fluency outcomes (Chafouleas, Martens, Dobson, Weinstein, & Gardner, 2004). Shaywitz and Shaywitz (2004) found that struggling readers increase their oral reading fluency growth when they are provided performance feedback from their teachers. Performance feedback generally involves having a student read a passage within a set timeframe and then informing the student of how many errors were read and/or how many words were read correctly. Performance feedback is provided orally or through visual representation, such as graphs that display the data (Eckert et al., 2002). Performance feedback can include the provision of a contingent reward along with the provision of feedback data (Eckert, Ardoin, Daisey, & Scarola, 2000). Contingent reward involves the provision of a verbal or tangible reward to help students increase their oral reading fluency

growth by motivating them to reduce errors read or to increase words read correctly (Allor & Chard, 2011).

Studies found in the literature base have focused on the use of performance feedback in conjunction with other oral reading fluency methods like repeated reading and preview. Neddenriep, Fritz, and Carrier (2011) found that four out of five fourth-grade student participants raised their oral reading fluency levels to an instructional or mastery level and achieved reading comprehension growth when provided the number of errors read and the number of words read correctly using a curriculum-based measurement combined with the repeated reading method. Huang, Nelson, and Nelson (2008) found that for four second-grade students who were provided with performance feedback on the number of words missed when using the repeated reading method, the students' overall oral reading fluency reading comprehension increased by one grade level. Lo, Cook, and Starling (2011) found that the use of a repeated reading intervention program combined with eight reading fluency components, including performance feedback, resulted in the improvement of the second-grade participants' oral reading fluency levels to near grade level. Guzel-Ozmen (2011) examined the effect on oral reading fluency for the preview, repeated reading, and performance feedback methods when used in varying combinations. Two out of the four participants demonstrated improvement for the condition involving all three methods. Despite the improvement of the participants' oral reading fluency levels when using performance feedback in conjunction with the other reading fluency methods, the results were limited because of the very small sample sizes and because the individual effects of each reading fluency method were not able to be determined.

The need exists in the literature to further examine the effects of performance feedback as a stand-alone method for improving oral reading fluency (Rasinski & Hoffman, 2003). For those

studies that have investigated the effects of only performance feedback on oral reading fluency, the studies have varied in the provision of the number of errors read and/or the number of words read correctly. An early study by Thorpe, Chiang, and Darch (1981) found that when student groups and individual students were provided with the number of errors read after each administration of an oral reading measure, the number of errors read on subsequent administrations decreased. A multiple-baseline study by Alber-Morgan, Ramp, Anderson, and Martin (2007) involved a phase in which the number of words read correctly was provided to the participants after each reading fluency measure. Results showed an overall, upward trend for all students across the duration of the intervention. Another study by Eckert, Dunn, and Ardoin (2006) involved the provision of both the number of errors read and the number of words read correctly. The results for both types of performance feedback data indicated overall gains in oral reading fluency for all the participants with feedback condition of the number of errors read resulting in higher oral reading fluency gains.

Because current legislation and best practices mandate the use of systematic, data-driven, and research-based measures for measuring reading fluency, the literature supports the use of curriculum-based measurement as a valid and reliable method for measuring oral reading fluency growth (Deno, 1985). Curriculum-based measures have been well established in the literature as an effective and systematic method for measuring oral reading fluency performance. Fuchs and Fuchs (2002) found curriculum-based measures to be reliable and valid because those measures reflect the major components of most reading curricula and provide for standardized procedures allowing their use across a variety of student populations that have varying levels of oral reading fluency proficiency.

Curriculum-based measures are considered an outcome-based measure because they provide a reliable, long-term growth measurement for oral reading fluency (Stecker, Fuchs, & Fuchs, 2005). According to Shinn (2013), general-outcome measures, like curriculum-based measures, provide a way to use smaller amounts of oral reading fluency performance data to draw conclusions about a student's overall reading ability. Curriculum-based measures are considered effective tools for assessing oral reading growth for three reasons. Curriculum-based measurements results can be compared to established criteria, curriculum-based measures take less time to administer than other standardized achievement measures, and curriculum-based measures require relatively simple administration and data recording procedures (Hasbrouck & Tindal, 2006). Curriculum-based measures generally involve having a student reading for one minute from a passage while being provided error correction (Coulter, Shavin, & Gichuru, 2009; Deno, 1985; Shinn, 2007). The ease of these measures also allow for more opportunities during the school year to measure student oral reading fluency growth and increase opportunities to implement necessary instructional and curriculum changes (Graney & Shinn, 2005).

Statement of the Problem

The extant literature on performance feedback has indicated that there is a need to further investigate the effects on oral reading fluency when providing only performance feedback data as measured by an oral reading fluency measure. Current research includes a limited number of studies that investigated performance feedback not combined with other reading fluency methods. The literature also indicates inconsistencies among those limited studies regarding which type of performance feedback data provided and which type of performance feedback data have most affected oral reading fluency (Alber-Morgan et al., 2007; Eckert et al., 2006; Thorpe et al., 1981).

Among those studies addressing only performance feedback, the provision of the feedback data has varied in providing the number or errors read and the number of words read correctly. In 2003, Rasinski and Hoffman analyzed several oral reading fluency methods and concluded that more research was needed on the performance feedback method being utilized. Available studies also did not consistently measure the results using a curriculum-based measure; therefore, more information is needed with respect to measuring the effect of performance feedback through the use of curriculum-based measures. The proposed study provided additional data regarding how performance feedback affects oral reading fluency when other reading fluency methods are used. The proposed study also added to the literature regarding performance feedback using curriculum-based measures.

Research Question and Hypotheses

The research question and hypotheses was as follows. Does the provision of performance feedback result in differential oral reading fluency rates of improvement (ROI [acceleration]) and levels of words correct per minute in a second-grade sample of students, and if so, which type of feedback condition has the most effect on acceleration and on the level of words correct per minute? It was hypothesized that the subjects in the Errors Group would display greater oral reading fluency acceleration and higher levels of words correct per minute than the subjects in the Words Correct Group, the Errors + Words Correct Group, and the No Feedback Group after adjusting for pre-test differences. Thorpe et al. (1981) and Spencer and Manis (2010) found that when the number of errors read was provided, oral reading fluency gains occurred when compared to the condition of providing no performance feedback. Eckert et al. (2006) used a multiple-baseline study to separately investigate the conditions of performance feedback for the number of errors read and the numbers of words read correctly. Results showed that the

provision of the number of errors read was more effective for increasing oral reading fluency. McCurdy's and Shapiro's (1992) study involved a condition in which both the number of errors read and the number of words read correctly were provided. Results showed oral reading fluency gains; however, it could not be determined which performance feedback provision was more effective as there were no separate conditions of providing the number or errors read and the number of words read correctly for comparison.

It was hypothesized that the subjects in the Words Correct group would display greater oral reading fluency acceleration and higher levels of words correct per minute than the subjects in the Errors + Words Corrects Group and the No Feedback Group after adjusting for pre-test differences. The reviewed studies involving only the provision of words read correctly and a baseline/control group condition of no feedback showed that more oral reading fluency gains were made by the participants during the provision of words read correctly condition (Alber-Morgan et al., 2007; Chafouleas et al., 2004; Conte & Hintze, 2000; Eckert et al., 2002; Neddenriep et al., 2011; Noell et al., 1998).

Finally, it was hypothesized that subjects in the Errors + Words Correct Group would display greater oral reading fluency acceleration and higher levels of words correct per minute than the subjects in the No Feedback Group after adjusting for pre-test differences. Although the literature reflects a limited amount of studies involving a condition of performance feedback in which both the number of errors read and the number of words read correctly, McCurdy's and Shapiro's (1992) study involved a performance feedback condition in which both the number of errors read and the number of words read correctly were provided to the participants. The rate of improvement for those participants exceeded the oral reading fluency rate of improvement for participants in the baseline group for that condition.

The proposed hypothesis that the provision of the number of errors read will yield the most reading fluency gains is based on the previously stated theories in that being made aware of errors will allow the student to focus directly on letter-sounds and patterns and utilize visual, language-based, and memory processes to process and to retrieve the correct word. Less proficient readers are less likely to realize a word recognition error, and if recognized, they are less likely to know how to correct the word (Jenkins & Larson, 1978). By providing error correction, students are provided an opportunity to further develop accuracy and automaticity as outlined by the bottom-up reading fluency models.

The hypotheses are based on bottom-up processing theory and corresponding models associated with reading fluency. The bottom-up processing theory states that reading occurs by initially recognizing and processing individual graphemes and phonemes and then advancing to more complex words, sentences, and paragraphs based on the already visually-learned graphemes and phonemes (Fuchs, Fuchs, Hosp, & Jenkins, 2001; Uhry & Clark, 2004; Zainal, 2003). The bottom-up theory focuses on the basic components of letter and sound development so that the reading fluency components of accuracy and automaticity can be fully achieved thus leading to solid comprehensions skills. LaBerge and Samuels (1974) developed a bottom-up processing model with their theory of automatic information processing. Reading fluency is built on initially achieving automaticity in visually recognizing and processing letters and patterns of those letters to form words. Letters are visually coded by their shapes and specific features such as curves, lines, and spaces along with their sounds and eventually are stored in memory.

LaBerge and Samuels (1974) also emphasized the importance of attention skills in determining the progression of accuracy and automaticity. Even though a student may gain high

automaticity for recognizing letter-sounds, if the amount of attention needed to produce accuracy for the blending process is high, further development of automaticity will be delayed and reading fluency skills will likely be underdeveloped. LaBerge and Samuels suggested increased print exposure to increase automaticity of letter-sounds and words from memory which, in turn, decreases attention demands, thus improving accuracy and automaticity.

Similar to LaBerge and Samuels (1974), Zainal (2003) discussed that Gough's model (One Second of Reading) was developed based on the theory of attaining automaticity and accuracy through visual input. However, Gough's model placed more emphasis on recognizing and processing words through sounds rather than the visual shape of the graphemes and letter-sound patterns (Florit & Cain, 2011; Zainal, 2003). Gough furthered his theory into a later model (A Simple View of Reading) where comprehension of the words being decoded is also necessary for the development of overall reading skills (Gough & Tunmer, 1986; Uhry & Clark, 2004).

Ehri (2005) combined Gough's and LaBerge's and Samuels' theories by placing more emphasis on how letters make specific sounds in words and committing those visual and sound patterns to memory so that they can be automatically applied to words with similar letter-sound patterns. Once the basic pattern letter-sound patterns are established in memory, automaticity and accuracy are increased as the need for attention to decoding is decreased.

Assumptions

First, it was assumed that all students involved in the study were instructed with the same second-grade curriculum and were capable of participating in a second-grade level curriculum-based measure. Second, it was assumed that all data and identifying information were handled by personnel who had the knowledge and training to ensure confidentiality. Third, it was

assumed that those personnel administering the reading fluency curriculum-based measure had

the appropriate training to adhere to standardized assessment and data collection procedures.

All of these assumptions were met. Past practices and district requirements indicated that

all second-grade teachers instruct their students using the same second-grade curriculum.

Second-grade students who attended the elementary school for at least their kindergarten or first-

grade school years participated in past curriculum-based measures similar to those used for this

study. As reported by district administration, those personnel who handled all data and

identifying information and who administered the curriculum-based measures were provided

district training in such procedures and currently engage in those procedures as required for their

job duties.

Limitations and Delimitations

There were limitations to this study that could have impacted the internal validity of the

results. One limitation was that the results from the curriculum-based measure may not have

been a true representation of skills as some students may experience a "bad" day when assessed.

Although it was assumed all students were instructed in the second-grade curriculum, the level of

student instruction could have been affected by individual teaching styles, use of curriculum

materials, and time spent on instructional topics. Student instruction could have also been

affected by classroom dynamics associated with class size or the number of students displaying

academic issues and/or behavior problems. Results could have been affected by student

maturation, experimental mortality, or absenteeism during the study.

Further, one delimitation of the study results was the ability to generalize the results to

other student populations. The study was limited to second-grade students within an elementary

school district in western Pennsylvania. Also, the effectiveness of performance feedback on

11

specific groups within the second-grade population such as students with disabilities, male students, female students, and students receiving additional remedial reading instruction were not explored. A second delimitation was that the study results were limited to the second-grade students and the AIMSweb system used for the study.

Definition of Terms

Accuracy: Accuracy is the percent correct of words recognized in print (Hosp & MacConnell, 2008).

Automaticity: Automaticity is reading a desired number of words read correctly within a specified timeframe (Nathan & Stanovich, 1991)

Decoding: Decoding is the ability to accurately recognize words by matching printed letters with their sounds (Lerner, 2003).

Error correction: Error correction is typically viewed as providing a correct response to an inaccurate response (Mangano, 1983). For this study, error correction was operationally defined as the provision of the correct word after three seconds in which a student did not verbally say the correct word during a one-minute oral reading fluency probe.

Error feedback: Error feedback was operationally defined for this study as the provision of the number of errors read after the administration of a one-minute oral reading fluency probe.

Fluency: Fluency is theorized as the speed and effort in which a student reads words in text (Hosp & MacConnell, 2008). For this study, fluency was operationally defined as the number of words read correctly in one minute using a curriculum-based oral reading fluency probe.

Graphemes: Graphemes are the printed individual letters that make up words (Lerner, 2003).

Oral reading fluency: Oral reading fluency is "the number of words a reader can read on grade-level text in a minute" (Rasinski, 2012, p. 516). For this study, oral reading fluency was operationally defined as the number of words read correctly in one minute using a curriculum-based oral reading fluency probe.

Oral reading fluency curriculum-based measurement: Oral reading fluency curriculum-based measurements are one-minute standardized tests used to evaluate the effects of instruction or interventions by scoring grade-level passages at the end of one minute according to the number of words read correctly (Reschly et al., 2009; Shinn, 2008).

Performance feedback: Performance feedback is a performance-based strategy involving the provision of feedback in visual or verbal form to influence oral reading fluency outcomes (Chafouleas et al., 2004). For this study, performance feedback was operationally defined as the provision of the number of errors, the number of words correct, or both the number of errors and words correct to the subject after the administration of a one-minute oral reading fluency curriculum-based measure.

Phonemes: Phonemes are the individual sounds in words (Lerner, 2003).

R-CBM: The acronym R-CBM is specific to the oral reading fluency measure used in the AIMsweb curriculum-based measurement system (Daniel, 2010). The R-CBM acronym is equivalent to the acronym of CBM-R commonly referenced in the literature as a general curriculum-based measure of oral reading fluency (Christ, 2006).

Speed: Speed is a component of oral reading fluency and is a measure of how fast words are recognized (Logan, 1997).

CHAPTER 2

REVIEW OF LITERATURE

Reading Fluency

Definition of Reading Fluency

Reading fluency has been widely recognized in the literature as a foundational reading

skill necessary for the development of more complex reading skills and overall reading ability.

The National Reading Panel (2000) defined reading fluency as "the ability to read a text quickly,

accurately, and with proper expression" (National Institute of Child Health and Human

Development, 2000, p. 3-5). Because speed and accuracy directly impact each other's outcomes,

these components are often referred to as automaticity. Automaticity is reading a desired

number of words read correctly within a specified timeframe and is improved by increased word

recognition (Nathan & Stanovich, 1991). Paige, Rasinksi, and Magpuri-Lavell (2012) stated that

to develop automaticity, instruction to increase word recognition should occur rather than

focusing on simply reading at faster rates. Rasinski (2012) emphasized the importance of

automaticity by concluding that the "hallmark" definition of reading fluency is "the number of

words a reader can read on grade-level text in a minute" (p. 516). Uhry and Clark (2004) also

defined reading fluency based on both speed and accuracy by stating "fluent reading is quick;

words are recognized automatically, without the need for sounding out or figuring out from

context" (p. 149).

Although much of the literature on reading fluency emphasizes the components of speed

and accuracy in oral reading, the literature does not provide as much information about the oral

reading fluency component of reading with expression, also known as prosody. Prosody is

defined as the different meanings of text that can be gained based on the tone, word emphasis, or

14

loudness of text read (Rasinski, 2012). Kuhn et al. (2010) stated that there is an overemphasis on improving only automaticity excluding the focus on the natural rate and intonation of reading language aloud; therefore, oral reading fluency is not being completely developed. Prosody should not be overlooked when considering oral reading fluency skills, as poor fluent readers often display less inflective and flat tones when reading (Paige et al., 2012). Fuchs et al. (2001) recommended that more study is needed to determine the long-term effect of under-developed prosody as it may be linked to variance for later reading comprehension skills. The expressiveness of fluent reading through inflection is dependent upon the development of speed and accuracy and can be an indicator of the reader's comprehension (Uhry & Clark, 2004).

Rasinski, Rikli, and Johnston (2009) investigated the relationship between oral reading fluency and reading comprehension by measuring prosody. The students were rated based on expression, smoothness, and pace of their passage readings. The resulting prosodic rating was then compared to each student's results from a standardized comprehension assessment and the oral reading fluency rate obtained during the passage readings. The study results showed that higher proficiency in prosodic oral reading correlated with higher levels of silent reading comprehension. The authors concluded that oral reading fluency instruction should include prosody along with oral reading fluency. Yildiz, Yildirim, Ates, and Cetinkaya (2009) also investigated the effect of prosody in relation to oral reading fluency. Students were rated on the expression, smoothness, and pace of their readings. Both the number of errors and words read correctly were recorded during the readings. The results showed that although all the participants achieved within expected reading speeds for their grade level, 40% of the participants were rated well below expected levels for prosody. It was also found that those students, who demonstrated acceptable prosodic reading skills, had increased reading speeds.

The authors concluded that teachers should increase time spent on developing prosody so that reading speed and reading comprehension can be improved.

Importance of Reading Fluency

Oral reading fluency, particularly the components of speed and accuracy, is considered one of the most important factors in the development of reading skills. Deno (1985) stated that "the number of words read aloud correctly and incorrectly from a basal text reliably and validly discriminates growth in reading proficiency throughout the elementary school years" (p. 224). The National Reading Panel (2000) identified reading fluency as an essential skill for the development of the more complex reading skills of vocabulary and reading comprehension. Jenkins, Fuchs, van den Broek, Espin, and Deno (2003) found that not only does oral reading fluency predict reading comprehension but oral reading fluency skills developed from reading in text versus reading words in isolation (word lists) are stronger predictors of reading comprehension. Neddenriep et al. (2011) confirmed that implementing methods to improve oral reading fluency to a specific level (approximately 90 words correct per minute) allows adequate reading comprehension to occur. Even further, Fuchs et al. (2001) found a higher correlation between oral reading fluency and comprehension than between silent reading fluency and comprehension.

Improving the speed and accuracy of oral reading fluency skills during the early elementary years is important so that the time and energy of older student readers wasted on decoding words could be decreased and more effort could be focused on comprehending material (Rasinski, 2012). Spear-Swerling (2006) found that early oral reading fluency rates in third grade had a significant impact on reading comprehension levels in fourth grade. The author also

found that when word recognition (accuracy) for oral reading fluency is improved, vocabulary knowledge is improved which then leads to improved reading comprehension.

Speece and Ritchey (2005) identified first grade as a critical time period for the development of decoding and sight word recognition skills as these skills ultimately determine the development of oral reading fluency skills. The authors' analysis of first-grade and second-grade oral reading fluency results showed typical first-grade students gain an average of 1.5 words per week compared to struggling first-grade readers who average 0.75 words per week. Gains for typical first-grade readers begin to decline to a rate of less than one word per week from the middle of first grade to the end of second grade. Also, their findings showed that those first-grade students identified as at risk in the fall of first grade for oral reading fluency read approximately half the number of words per minute at the end of first grade than typical first-grade peers. Therefore, the authors concluded that more programming for the development of oral reading fluency must occur early in first grade or even prior to first grade.

Fuchs and Fuchs (1993) conducted a two-year study where students in grades 1-6 participated in weekly oral reading fluency probes for the first year to determine weekly growth rates per grade level. Growth was determined by slope data. Results showed that weekly oral reading fluency growth was significantly different by grade and that "slopes at Grade 1 also were reliably greater than at every subsequent grade" (p. 8). The authors concluded that the most oral reading weekly fluency growth occurs at first grade with a rate of improvement of two words per week and subsequently decreases to 0.5 or less words per week by fifth and sixth grades.

The importance of reading fluency has been linked to other aspects of academic outcomes such as high-stakes testing performances and high school dropout rates. Using consistent oral reading fluency measures and implementing programming to address oral reading

17

fluency levels in the early elementary years can predict similar outcomes on later high-stakes testing (Baker et al., 2008; Stage & Jacobsen, 2001). Reschly et al. (2009) conducted a meta-analysis to determine the association of the results from an oral reading fluency curriculum-based measure to future performance on high-stakes assessment results. The review showed that early-grade results on the oral reading fluency curriculum-based measure were a strong indicator of future high-stakes results; therefore, early identification of oral reading difficulties could prevent difficulties on future assessments that would lead to poor test performance.

Because improvement of overall reading ability is needed to ensure long-term academic success and because reading fluency is a major component of overall reading ability, the improvement of oral reading fluency needs to occur early in a student's school career so that the negative impact on future high-school and post-secondary successes are decreased. The 2013 annual graduation report update recommended a focus on improving early elementary reading skills by third grade because students lacking third-grade reading skills are four times more likely to drop out of high school (Balfanz et al., 2013).

The Need for Reading Fluency Methods

Recent legislation and major reviews regarding reading fluency have found that oral reading fluency methods that involve direct guidance or feedback provide better fluency outcomes. Because the No Child Left Behind Act of 2001 (NCLB) and the 2004 Individuals with Disabilities Education Improvement Act (IDEIA) mandated improvement for reading fluency, the amount of research studies and the development of scientifically-based methods for reading fluency improvement has increased (IDEIA, 2004; NCLB, 2002). In 2000, the National Reading Panel identified a lack of focus for reading fluency in instruction and recommended an increase in reading fluency practices. The National Reading Panel Subgroup Report (2000)

concluded "that guided repeated oral reading procedures that included guidance from teachers, peers, or parents had a significant and positive impact on word recognition, fluency, and comprehension across a range of grade levels" (National Institute of Child Health and Human Development, 2000, p. 12).

Categories of Reading Fluency Methods

Educators and researchers have responded to recommendations for increased use of reading fluency methods involving direct guidance or feedback. Many studies have been conducted over the years specifically exploring the use of reading fluency methods that directly provide one-on-one involvement or individualized feedback when engaging in a reading fluency method. According to Eckert et al. (2000), those reading fluency methods involving direct guidance and response to performance can be categorized as either skill-based (e.g., repeated readings) or performance-based (e.g., performance feedback of data or tangible reward). Of these two reading fluency methods, a large portion of existing studies have primarily involved skill-based reading fluency methods. Even further, the extant literature shows researchers to have explored skill-based reading fluency methods as individual methods or in combination with other skill-based or performance-based methods. The available literature is limited regarding studies that have explored performance-based reading fluency strategies as stand-alone methods.

Skill-based reading fluency methods. Skill-based reading fluency methods have been well-supported in the literature and have emerged as common choices for improving reading fluency. The methods of repeated reading, preview, shared reading, peer coaching, neurological impress, Readers Theatre, choral reading, and radio reading are several methods that have been frequently paired with performance-based methods. Repeated reading is likely the most common skill-based reading fluency method used as a stand-alone method or in conjunction with

19

performance-based methods. Samuels (1979) is credited with the first major study that established the effectiveness of repeated reading and the method from which subsequent studies have followed. Repeated reading can be summarized as having as student read the same passage several times with the provision of error correction during each reading until the student meets an established criteria within one minute of reading (Lo et al., 2011). Therrien (2004) recommended the use of repeated reading as a long-term method for the improvement of reading fluency skills. He further stated that, when using repeated reading for measuring reading fluency growth, a goal should be established and the provision of error correction during readings must occur. Although Musti-Rao, Hawkins, and Barkley's (2009) study results confirmed that reading fluency growth occurs when using repeated reading with error correction and pre-established criteria for each practice reading, the authors also found that students are not able to apply reading fluency gains to unfamiliar reading material.

A common skill-based reading fluency method that has been paired with performance based methods is preview. Preview occurs by having students read designated material aloud or silently prior to instruction so that they can become familiar with word recognition, vocabulary, and comprehension, all of which increase the students' performance on later assessments (Welsch, 2006). Preview also occurs when an adult or other peer read the material aloud to the student prior to instruction or assessment of that material (Swain, Leader-Janssen, & Conley, 2013). Begeny et al. (2009) found that when students are provided the reading material to read along or silently follow along with an adult reading the material aloud, higher reading fluency gains are achieved more so than when the students only listen to a passage being read aloud without having the reading material in front of them.

Another skill-based method is shared reading where an adult initially reads the material to the student, the student then reads the material aloud to the teacher, and then continues to read the material aloud to peers or other adults (Welsch, 2006). Peer coaching is a reading fluency method where stronger student readers (coaches) are paired with struggling student readers. Multiple readings by the struggling reader occur as the struggling reader reads initially reads the material aloud to the coach, the struggling reader and coach then take turns reading alternating lines aloud, and finally the struggling reader reads again with the coach pointing out unknown words (Marr, Algozzine, Nicholson, & Dugan, 2011).

A less common reading fluency method known as neurological impress is recommended by the National Reading Panel (2000) as a technique for oral reading fluency. Neurological impress was first introduced nearly 45 years ago. Heckelman (1969) defined the neurological impress method as having a teacher sit close enough to speak into a student ear. The teacher and student read the material aloud together with the teacher initially reading faster than the student. For each following reading, the teacher eventually slows his or her speed until it is the student who is leading the read aloud. Flood, Lapp, and Fisher (2005) later replicated Heckelman's study with an added comprehension component. Results showed an increase for reading fluency.

Other skill-based reading fluency methods place focus on reading fluency activities that can be provided to groups of students. One method is known as Readers Theatre where students are provided scripts created from classroom reading material. Teachers initially read the material aloud to students who then rehearse the assigned script roles thus providing multiple reading opportunities and increasing fluency and understanding of material (Hudson, Lane, & Pullen, 2005). Readers Theatre also provides support for all components of reading fluency including prosody and is considered more motivational than most reading fluency methods (Abadiano &

Turner, 2005; Mraz et al., 2013). A second group-based method, choral reading, is described by Paige (2011) as:

> Whole-class choral reading is a classroom strategy in which all students read aloud from the same text in unison with the teacher, who models accurate pronunciation, appropriate reading rate, and prosody (expression). At the end of the reading, the teacher provides corrective feedback to the class through explanation and modeling by reviewing problematic words and phrases, noting correct attention to prosodic markers, and encouraging the class to read with 'one voice.' (p. 435)

A third group-based method, known as radio reading, also targets the prosody component of reading fluency because of its vocal emphasis on words and phrases to create scenes, characters, and sound effects based on provided scripts created from curriculum materials (Hudson et al., 2005).

Performance-feedback methods. There is a need for more studies that primarily explore the effects of performance-based reading fluency methods such as performance feedback (Rasinski & Hoffman, 2003). Currently, the extant literature for performance-based reading fluency methods mainly reflects performance-based reading fluency methods used in conjunction with skill-based methods. Even further, only a small group of studies have been focused only on exploring the effects of performance-based reading fluency methods as stand-alone methods, thus indicating a need for an increase of studies that primarily explore the effects of performance-based reading fluency methods such as performance feedback. Performance feedback is provided in response to a student's performance on an oral reading fluency measure and is intended to influence the student's future reading performance outcomes (Chafouleas et al., 2004; Eckert et al., 2000).

Performance feedback is provided in the form of a reward and/or the provision of performance data (Eckert et al., 2000). Contingent reward is provided as verbal praise or tangible reward. Tangible rewards can be the provision of points or small token such as toys, candy, pencils given directly or earned and then exchanged for the small items or points earned (Daly, Garbacz, Olson, Persampieri, & Ni, 2006). Performance feedback more often involves the provision of data given verbally as the number of errors read and/or the number of words read correctly aloud by a student within an allotted time frame. Performance feedback data can also be provided graphically through line graphs or bar graphs depicting the total number of items correct, errors made, or rate of improvement achieved (Eckert et al., 2002).

A review of existing literature found that contingent reward has not been the primary focus of studies as it is generally paired with performance feedback data or skill-based reading fluency methods. The results of studies where contingent reward was provided have not shown consistent effects for improving reading fluency. For example, Allor and Chard (2011) found that the provision of contingent reward as a tangible reward can decrease student reading fluency errors. The authors concluded that contingent reward helps students decrease reading fluency frustration levels, thus increasing their motivation for reading and leading them to the achievement of reading success. Daly et al. (2006) conducted a study involving several conditions for multiple reading fluency strategies. One condition involved the provision of contingent reward if the student was able to meet pre-established criteria resulting from a practice passage where performance feedback data were provided for the reading fluency rate, number of errors made, and whether the student would have achieved the criteria set for that passage. Overall, students more often chose the performance feedback condition involving contingent reward which resulted in oral reading fluency gains. The authors concluded that the

provision of contingent reward was desirable and effective since the students chose that condition even though the contingent reward condition required the most effort of the strategies offered in the study.

In contrast, other studies involving contingent reward did not show a positive effect on reading fluency. Noell et al. (1998) conducted a multiple-baseline study involving two conditions where performance feedback (the number of words read correctly by the participants) was paired with contingent reward (token coupons) as the first condition. The second condition involved performance feedback data, token coupons, and the provision of preview and practice. Results showed increases in reading fluency increase for both conditions; however, the overall effectiveness of contingent reward could not be determined. Chafouleas et al. (2004) examined three conditions involving repeated reading, repeated reading plus performance feedback data (number of words read correctly), and repeated reading plus performance feedback data plus contingent reward (selection of a prize). Results showed that the condition involving contingent reward did not significantly add to any increase in reading fluency. Orcan and Ozmen (2012) conducted a study with two students involving three conditions of repeated reading, repeated reading plus performance feedback data (words correctly read), and repeated reading plus performance feedback data plus contingent reward. For the first student, the condition involving repeated reading plus performance feedback resulted in the most oral reading fluency gains whereas the repeated reading condition was the most effective for the second student.

Performance Feedback Data Used With Skill-Based Reading Fluency Methods

The majority of studies of providing performance feedback data has incorporated performance feedback data in combination with other skill-based reading fluency methods but did not investigate or determine the direct effect of only performance feedback data on oral

reading fluency. For example, a multiple-baseline study by Alber-Morgan et al. (2007) involved two conditions where the use of a standard repeated reading method was used for the first condition and the addition of the prediction method was used with the standard repeated reading method for the second condition. A performance feedback data component was also a part of each condition. After the each condition was administered, the participants read each passage two more times for one minute and then were verbally provided with the number of words read correctly after each one-minute reading. Results showed an upward overall increase of reading fluency for all students for both conditions. However, it was not determined if the performance feedback data component alone increased the number of words read correctly since the feedback data were provided in both conditions.

Neddenriep et al. (2011) conducted a study that compared the results of a baseline condition to a single condition that used the repeated reading method, error correction, and performance feedback data methods together. The performance feedback data were provided verbally as the number of words read correctly. Results were determined based on the students' performances on a reading fluency curriculum-based measure. For four out of five fourth-grade students, the students raised their reading fluency levels to instructional or mastery level and achieved reading comprehension growth. However, a study limitation was noted regarding the inability to determine the individual effect from each component of repeated reading, performance feedback data, and error correction. The authors recommended that future studies utilize a multiple baseline design to investigate the effect of each reading fluency component separately.

Guzel-Ozmen (2011) investigated the effect of adding a performance feedback data component to two skill-based reading fluency methods of repeated reading and preview. The

three study conditions consisted of repeated reading plus listening passage preview, repeated reading plus performance feedback data (provision of the number of errors read in verbal and graph forms), and repeated reading plus performance feedback data plus listening passage preview. Two of the four participants increased their reading fluency due to the repeated reading plus performance feedback data plus listening passage preview condition. It was recommended that further studies investigate more combinations of skill-based and performance-based reading fluency methods and that further analysis of each method's effect on reading fluency be conducted.

Similarly, Huang et al. (2008) used repeated reading, preview, and performance feedback data to determine the effects on two second-grade students' reading fluency. The students were first provided the preview method for each reading passage, then read each passage, and were then verbally provided the number of errors read. The students read the passage again and were provided the number of errors read and asked five comprehension questions. The procedure was then repeated at each participant's home the same day. Results showed that both second-grade students' overall reading fluency and reading comprehension increased by one grade level. A study limitation was that neither the preview, the repeated reading, nor the performance feedback data method occurred as separate components; therefore, no conclusions could be accurately made as to what effects the provision of performance feedback data had on increasing both the students' reading fluency and reading comprehension.

A study by Spencer and Manis (2010) involved 60 student participants from fifth through eighth grades. Students were placed either into a control or an experimental group. The study used a standard protocol that consisted of the repeated reading and performance feedback data methods. Students were asked to read a page of material in one minute. If the number of errors

26

was greater than two errors or the students did not read the page in one minute, the students were then provided the number of errors read verbally and were able to see the results in graphical form. The students then read the page again. Although the results showed increases in oral reading fluency for all participants, the individual effect of each fluency method was unable to be determined.

Lo et al. (2011) used a repeated reading intervention program that incorporated eight reading fluency methods into one condition for three second-grade students. Performance feedback data were used in various ways for three of the eight methods. For one of the methods, students were provided a graph of the number of words read correctly during the previous administration. For another method, the students were verbally provided the number of errors read. For the third method, the students were both verbally and graphically provided the number of words read correctly from the previous reading along with a second reading of the passage. All the students were able to improve their reading fluency to near grade level, but the method or combination of methods most effective was not able to be determined.

In their 2000 study, Eckert et al. utilized eight reading fluency conditions including a baseline condition to determine the effects on reading fluency for four students 7- to 8-years old. Performance feedback was a component for six of the eight reading fluency conditions. Both feedback data and contingent reward were individual conditions or paired with a skill-based method. The provision of feedback data was given in verbal and graph forms for the number of errors read for a one-minute reading fluency probe. The contingent reward was provided based on the student's ability to read the passage within three minutes and obtaining less than three errors read. The results showed that the condition of performance feedback data combined with a skill-based method showed the most improvement for reading fluency for two out of the four

participants. The authors noted several limitations including that each condition may have influenced the next condition presented. Long-term growth for oral reading fluency could not be determined as only two conditions were presented at a time for each session. Also, the differing degrees of difficulty for each passage may have influenced the students' oral reading fluency results making the results unreliable.

Eckert et al. (2002) conducted a study involving six students ages 7- to 9-years old. A skill-based method of preview plus repeated reading was used for all four study conditions. A baseline condition was also used to compare results. For two of the conditions, performance feedback data was paired with the skill-based method and then for a condition consisting of the skill-based method plus contingent reward. Performance feedback data were provided as the number of words read correctly. During the performance feedback data conditions, the students were informed of their previous session performance, asked to set a goal for the current session, and then were verbally and graphically informed of their current session performance. Results showed that all participants increased reading fluency under the skill-based only condition. For four of the six participants, reading fluency gains were also made when contingent reward or the performance feedback data were paired with the skill-based method. The authors stated several limitations including that notion that each of the performance feedback methods may have influenced results as a reinforcer to the students. Also, the baseline levels for each student showed much variation for initial fluency skill level expectations and passage difficulty may have been too varied. The authors recommended that future studies investigate each component separately to determine the effect from each of the components on reading fluency.

Performance Feedback Data as a Stand-Alone Reading Fluency Method

The extant literature for studies in which performance feedback has been used as a stand-alone method for reading fluency is limited. Also, studies involving performance feedback data show inconsistencies among which type of performance feedback data (errors read or words read correctly) was provided and in which form (verbally or graphically) the data were presented (Rasinski & Hoffman, 2003). An early study by Thorpe et al. (1981) involved a baseline phase and two conditions of performance feedback data where the number of errors read was provided as a mean for the students as a group and as an individual total for each student. The study included only a measure of accuracy. Instead of using a one-minute curriculum-based measure, the students instead read from the same daily passage and the number of errors read was determined based on the total number of words within the passage. The number of errors read was provided both verbally and graphically to the students. Even though results showed a decrease for the number of errors read on subsequent reading passages for the study participants, a determination was not made on whether providing the performance feedback data verbally or graphically was more effective.

McCurdy and Shapiro (1992) conducted a study involving performance feedback data delivered to participants by their teachers and their peers. Results were based on the students' performances on one curriculum-based measure administered for one minute during each session. Performance feedback data were provided verbally and visually to the students for both the number of words read correctly and the number of errors read for each session. Although results showed that more reading fluency gains were made when performance feedback data were provided by the teachers, results did not indicate whether the provision of the number of

errors read or the number of words read correctly had the most effect for improving reading fluency.

Conte and Hintze (2000) conducted a study involving 13 second-grade students who participated in three performance feedback data conditions involving the provision of the number of word read correctly. All participants were administered one-minute curriculum-based probes twice weekly. For the first condition, the students were not provided performance feedback data. For the second condition, the students were provided, at the beginning and end of each session, their performance feedback data in graph form with a reminder of their biweekly goal. For the third condition, the students were provided, at the beginning and end of each session, the performance feedback data in graph form with a reminder of their goal for the end of the study. Results showed that the performance feedback data condition with a reference to the student's biweekly goal provided the most gains for reading fluency.

Few studies have investigated both the individual performance feedback data methods of providing number of errors made and number of words read correctly within the same study as separate conditions. Eckert et al. (2006) investigated the effect of the three conditions of providing no feedback, providing the number of errors read, and providing the number of words read correctly. Eckert et al. conducted their study with six second-grade students over nine weeks with data gathering occurring twice weekly. The choice of which condition would occur at each session was determined randomly with an equal number of administrations across the duration of the study. Oral reading fluency one-minute probes were developed incorporating the standard criteria and procedures for curriculum-based measures and were developed using the students' second-grade reading series.

The study results showed higher gains in reading fluency for most participants for condition of the number of errors read. The results were in contrast to the authors' previous study results that showed the condition of words read correctly to produce higher gains for oral reading fluency. Unexpectedly, the provision of no feedback resulted in equal or better gains for some of the participants. The authors were not able to determine why the number of errors read condition resulted in higher gains. The authors hypothesized that the randomness of the conditions provided per session could have influenced the students' response to the next session. Overall, the study did establish that the provision of performance feedback data is effective for increasing student oral reading fluency and provided evidence that the use of contingent reward for performance feedback was not necessary. The authors recommended that further studies be conducted to study the effectiveness of providing both words read correctly and incorrectly in the same session and conducting more sessions to measure long-term growth.

Curriculum-Based Measures

Curriculum-based measures have been the primary choice for determining reading fluency growth for reading fluency methods such as performance feedback. Generally, curriculum-based measures are defined as "a set of standardized and validated short-duration tests 1-4 minutes long in reading (e.g., oral reading, maze), mathematics computations, mathematics applications, spelling, written expression, early literacy" (Shinn, 2007, p. 608). The research base for the use of curriculum-based measures has been established for nearly 30 years (Shinn & Good, 1992). In 1985, Deno provided initial support for the use of curriculum-based measures. He found curriculum-based measures to be a better method to more accurately measure academic progress as opposed to standardized achievement tests, teacher perspectives, and test scores. Deno concluded curriculum-based measures meet desired criteria of being cost

effective, time efficient, and an accurate method of obtaining student reading fluency

performance that can be compared to criteria within the student's curriculum. He also concluded

that curriculum-based measures provide to school staff a valid and reliable source of data from

which instructional decisions can be made. Curriculum-based measures for oral reading fluency

are administered using standardized procedures, which provide for universal comparisons for all

learners across all reading curriculums and allow for data-driven decision-making (Hasbrouck &

Tindal, 2006).

Curriculum-based measures provide a way for educators to establish criteria based on

their own students' reading fluency performances since using their own personal judgment is not

always accurate especially for determining frustration, instructional, and mastery levels (Eckert,

Dunn, Codding, Begeny, & Kleinman, 2006). When teachers are able to assess, monitor, and

adjust instructional practices according to specific academic data, better grade-level decisions

can be made leading to overall improved student performance across the district (Hosp, 2008).

Curriculum-based measures make it possible to measure long-term growth which allows

educators to determine if instruction or interventions are working and make necessary

modifications more often (Fuchs, Fuchs, & Stecker, 1989; Shinn, 2013). Teachers can also set

goals based on measured progress, monitor student responses to instructional methods for

meeting established goals, and know more readily when to make changes to instructional

methods because of tracking growth over time (Fuchs & Fuchs, 2002). Curriculum-based

measures offer an alternative formative method to the traditional summative methods that occur

at the end of the school year when no time is available for instructional, curriculum, or

intervention modifications (Graney & Shinn, 2005).

Specifically, curriculum-based measurement for reading fluency growth is determined through the use of one-minute probes where "students read passages of connected, meaningful text aloud for 1 minute" (Graney & Shinn, 2005, p. 184). According to Shinn and Good (1992), oral reading fluency is measured by the number of correct words read in one minute including those words that were self-corrected by the student. The errors read are also calculated based on the number of words mispronounced, omitted, substituted, or provided to the students within three seconds of hesitation. Standard error correction is supplying the correct words to the student within three seconds of the student omitting or incorrectly pronouncing a word during probe administrations (Therrien, 2004). Curriculum-based measures provide established national norms per grade level and provide an established average oral reading fluency growth expectation of 1.5-2.0 words per week for early elementary students (Christ, Zopluoglu, Long, & Monaghen, 2012; Fuchs & Fuchs, 1993).

The research has established that curriculum-based measures developed directly from a student's curriculum materials or those from commercially-available measures produce similar reading fluency results as long as the curriculum-based measures contain three essential components: 1) repeated testing must take place over time, 2) the measurement must contain criterion to measure outcomes against, and 3) measures should provide qualitative and quantitative information that allows opportunity to modify instruction (Fuchs & Deno, 1994). When developing curriculum-based measures directly from a specific reading curriculum, Hintze and Shapiro (1997) found that curriculum-based oral reading fluency measures were equally sensitive in measuring fluency growth no matter if the students were instructed from a basal-based or whole-language curriculum. Powell-Smith and Bradley-Klug (2001) conducted a follow-up study to determine if curriculum-based measures that were not derived from a

student's specific reading curriculum (generic or commercially-developed) were still effective

measures for determining reading fluency growth. The results indicated that the use of either

basal-based or generic curriculum-based measures result in student reading fluency growth.

However, the authors noted that the generic curriculum-based measures could be more

advantageous as those measures did not require time and effort to develop.

Reliability and Validity of Curriculum-Based Measures

Reliability and validity using words lists. The reliability and validity of curriculum-

based measures have continued to be studied for nearly 30 years. An early study by Fuchs,

Fuchs, and Maxwell (1988) attempted to establish the reliability and validity of oral reading

fluency curriculum-based measures by comparing oral reading fluency gains to those from

simply reading a word list. The authors investigated the correlation of a curriculum-based oral

reading fluency passage measure, a passage retell measure, a comprehension question test

measure, and a cloze comprehension measure to performance on two subtests of a standardized

comprehension assessment. The first subtest involved words in isolation (word study skills)

whereas the second subtest (reading comprehension) involved words in context. With regards to

criterion validity, when the oral reading fluency measure was compared across both subtest

performances of the standardized achievement assessment, it correlated with the standardized

achievement assessment with a mean of .89. For construct validity, the average number of words

read correctly from the oral reading fluency measure correlated higher (.92) with the reading

comprehension subtest than the word study skills subtest (.82). When the oral reading fluency

measure was compared to the reading comprehension subtest performance of the standardized

achievement measure, it had the highest correlation than the other three curriculum-based

measures. For concurrent validity among the three curriculum-based measures, the oral reading

fluency measure correlated an average of .75 with the recall and cloze measures and an average

of .84 for the comprehension measure. The authors concluded that the study results supported

"the contention that oral reading rate is psychometrically useful as a method for monitoring

overall reading growth, including comprehension" (p. 27).

Marston (1989) conducted a review of 14 studies from 1981 through 1984 that

investigated the criterion-related validity of oral reading fluency curriculum-based measures

(oral readings from basal readers) compared to standardized assessments. The standardized

assessments included the Stanford Diagnostic Reading Test, Woodcock Reading Mastery Test,

and the reading comprehension subtest from the Peabody Individual Achievement Test.

Correlation coefficients were found to range from .63 to .90 with the majority of the coefficients

greater than .80. Marston also reviewed the criterion-related validity of the curriculum-based

measures in relation to the standardized assessments. Correlations ranged from .57 to .86 with

half over .80.   Further, Marston found that the when using the standardized assessments for

criterion, the results from the curriculum-based measures correlated higher with test performance

results (.84) than with the results of the word lists from those assessments (.76). Marston

reviewed one of the 14 studies along with four additional studies from 1981-1983 for reliability

estimates of the oral reading fluency curriculum-based measures. Test-retest reliability estimates

were found to be from .82 to .97 and interrater agreement was found to be .99.

In 1998, Good and Jefferson provided a summary of concurrent and criterion-related

validity study data within grade levels for second through six grades. The summary was

prepared as a response to Marston's review in 1989 for which he only analyzed criterion-related

validity across grade levels, thus possibly inflating the validity coefficients. Good and Jefferson

used only published or norm-referenced assessments for comparison and found criterion-related validity to range from .62 to .73 from second through six grades.

In 2013, Ardoin et al. conducted a study involving first- and second-grade students to determine whether a curriculum-based oral reading fluency passage versus a word list was a better measure of oral reading fluency and which measure was better correlated with standardized reading comprehension outcomes. The results showed that for both first- and second-grade students, oral reading fluency performance was higher for the reading passages than the word lists. The results also showed a strong relationship between performance on the oral reading fluency passages and performance on a standardized reading comprehension measure. The authors concluded that curriculum-based oral reading fluency measures are more than a simple measure of rate and are linked to reading comprehension outcomes more so than oral reading performance when reading word lists.

Reliability and validity reading general connected text. Christ, White, Ardoin, and Eckert (2013) focused on whether oral reading fluency curriculum-based measures are more than just a measure of speed and accuracy. The study involved students in second through sixth grades. The authors used three conditions where the directions presented to the students emphasized different aspects of oral reading fluency. The first condition encouraged the students do their best reading, the second condition encouraged the students to read quickly without mistakes, and the third condition encouraged the students to read knowing comprehension questions would follow. A standardized achievement assessment was used for comparison. Among the three conditions, significant differences were found in all grade levels for the second condition where students tended to read more words correctly per minute. The authors found that when students do engage in faster reading, they are more accurate than when encouraged to

36

read at their preferred pace. The study results also showed that the oral reading fluency curriculum-based measure's criterion validity (.65 to .79) of broad reading achievement was consistent with other study results. The authors also found that the addition of reading comprehension questions in the third condition did not enhance the criterion validity of the oral reading fluency measure. The oral reading fluency measure had strong predictive validity with the standardized achievement assessment without that condition. The authors concluded that a curriculum-based oral reading fluency measure provides a valid method of measuring oral reading fluency and continues to predict future reading achievement including reading comprehension.

Jenkins and Jewell (1993) investigated the relationship of oral reading fluency and comprehension curriculum-based measures to standardized reading assessments and teacher rankings of student reading ability for second through sixth-grade students. The results showed that for both curriculum-based measures, there was a strong comprehension correlation with the standardized comprehension assessments for all grade levels. Correlations (concurrent validity) for oral reading fluency and comprehension achievement results were higher in the early grades than in the middle grades. The correlation between oral reading fluency and comprehension for the first standardized achievement test decreased from .83 in second grade to .67 in sixth grade and decreased from .87 to .60 for the second standardized achievement assessment. The results were consistent with past study results that showed higher oral reading fluency growth in early elementary years indicating that oral reading fluency development is important in early school years as it impacts the development of later reading skills like reading comprehension.

Shinn and Good (1992) conducted their study to answer questions raised in the literature as to whether oral reading fluency curriculum-based measures provide more information about

other reading skills rather than just a measure of decoding. Results for the oral reading fluency

curriculum-based measures for third- and fifth-grade students were compared to various subtests

from a standardized reading assessment. The authors investigated the level to which the oral

reading fluency curriculum-based measures were related to similar reading constructs across the

standardized reading tasks. A latent construct variable of overall reading competency was

determined. It was found that for third-grade students, the oral reading fluency curriculum-based

measures correlated highly with the reading competence construct (.88 to .90). For the fifth-

grade students, a factor analysis indicated that overall reading competency was divided into two

construct categories of decoding and reading comprehension. The fifth-grade decoding results

showed the curriculum-based measure to correlate .89 to .90 and .74 to .75 for the reading

comprehension construct.

Reliability and validity of curriculum-based passages. The reliability and validity of

oral reading fluency passage probes have also been investigated throughout the literature,

particularly in determining whether the results from oral reading fluency curriculum-based

measures are valid and reliable because of variability in the passage probes. Poncy, Skinner, and

Axtell (2005) found that the variability and standard error were reduced when more probes are

administered. In addition, they found that when the level of difficulty between the probes is

reduced, the oral reading fluency results are more reliable (. 81 to .99). When describing the

usefulness of oral reading fluency curriculum-based measures, Fuchs and Fuchs (2011) stated

that the passages used for the one-minute probes should be designed to provide students with

similar levels of difficulty from probe to probe thus making them a consistent measure because

researchers and developers have determined the passages should be of equal difficulty between

passages and within grade levels.

Christ et al. (2012) determined that quality of oral reading fluency results is influenced by the quality of the passages used. The study investigated growth estimates for second- and third-grade students' oral reading fluency curriculum-based results by reviewing the number of data points, quality of the passages used, and the growth estimate method used. The authors used AIMSweb R-CBM passages as a previous study by Ardoin and Christ (2009) had found AIMSweb probes to have the least standard error of measurement (residual). For their study, Christ et al. determined that the standard error of measurement under optimal conditions was 5 words correct per minute and under less optimal conditions was 20 words correct per minute. Therefore, Christ et al. defined the quality of the passage sets used in their study as follows – residual of 5 (very good), residual of 10 (good), residual of 15 (poor), and a residual of 20 (very poor). The authors found that across grades, oral reading fluency curriculum-based results can be considered most reliable (split-half reliability of .76) for decision-making purposes if passages sets are used with a residual rating of 5, use a minimum number of 14 data points, and use the ordinal least squares growth estimate method.

Christ, Zopluoglu, Monaghen, and van Norman (2013) reviewed six studies including Christ et al. (2012) that investigated the influence of the quality of passages using AIMSweb R-CBM probes. The validity standard of .70 was reached after using passage sets with a residual of 5 or 10 and data were collected either daily or three times per week for six weeks or three times per week for eight weeks. The minimum reliability of .70 was reached when using passages with a residual of 5 for eight weeks at a higher frequency per week schedule of data points collected. Reliability of .90 was achieved when using passages with a residual of 5 for 12 weeks at a higher frequency per week schedule of data points collected. All reliability and validity levels were reached using the ordinal least squares growth estimate method.

AIMSweb as a Curriculum-Based Measure

     Since many study results have shown that the variability between oral reading fluency probe passage sets must be reduced to ensure the reliability of the oral reading fluency results, commercially-available oral reading fluency curriculum-based measures have been developed. These measures have been established as reliable and valid oral reading fluency curriculum-based measures because the developers have been able to reduce variability between the passages while determining the appropriate number of probes to be administered. The AIMSweb program is a commercially-available choice for providing curriculum-based measures for reading, math, and writing skills. The AIMSweb program is a computer-based data management system that provides the ability to administer probes, calculate results, and generate reports electronically (NCS Pearson, Inc., 2012c).

> AIMSweb is a universal screening, progress monitoring, and data management system
>
> that supports Response to Intervention (RTI) and tiered instruction. AIMSweb uses brief,
>
> valid, and reliable measures of reading and math performance for grades K-12, which can
>
> be generalized to any curriculum. (NCS Pearson, Inc., 2012a, para. 1)

 The computerized, data management feature provides educators with reports for the student's rate of improvement allowing for instructional modifications. The system also provides report options to compare results to national and state standards, obtain predictions for performance on state-mandated tests, compare results against national and local norms, and filter data according to sex and other demographic factors (Pearson Education, Inc., 2013). Specifically, the AIMSweb oral reading measure incorporates the major components of an oral reading fluency curriculum-based measure.

AIMSweb has endeavored to minimize the variability between oral reading fluency passages and provide an appropriate number of probe administrations and standardization procedures. Howe and Shinn (2002) conducted a study for the development of the AIMSweb probes. The selection of the passage probes for grades one through six were selected based having a mean of words correct per minute with no more than +1.0 standard error of measurement, a Lexile score within established grade-level ranges, and an alternate-form reliability of .70 or higher.

The AIMsweb technical manual (NCS Pearson, Inc., 2012d) was developed based on Howe and Shinn's development of the oral reading fluency passage probes. The manual provides reliability and validity data for the AIMSweb probes used across first through eighth grades. The alternate-form reliability ranged from .94 to .95, the test-retest reliability ranged from .93 to .95, the split-half reliability ranged from .93 to .95, and the interrater-reliability ranged from .93 to .95. The criterion validity was determined through correlations with two state assessments for grades three through eight. Criterion validity for grades three through five was approximately .70 and low to mid .60 for grades six through eight. Five literature studies that used either state reading assessments or standardized reading assessments were used as criterion for grades one through five. The criterion validity for these reading measures ranged from .53 to .81.

Christ and Silberglitt (2007) used AIMSweb oral reading fluency probes in determining the reliability and variance of using oral reading fluency curriculum-based measures. Data were collected at four-month intervals for first-grade through fifth-grade students over eight years from five school districts. The delayed test-retest reliability median across grades was .93 which the authors concluded was consistent with other ranges of test-retest reliability (0.89-.97) from

other studies. Because the reliability was found to be consistent within the study, the median

standard error of measurement was found to be approximately 10 words correct per minute

across grades. Large standard error of measurement leads to more variability of score results

which can lead to inappropriate instructional and academic decisions for students and

educational programs (Ardoin & Christ, 2009). Daniel (2010) summarized both the Howe and

Shinn (2002) and Christ and Silberglitt (2007) studies and found that "taken together, the two

studies indicate that the reliability of AIMSweb Reading Curriculum-Based Measurement (R-

CBM) benchmark scores is in the low .90s" (p. 3). Daniel also noted that the test-retest

reliability for the benchmark scores was consistent across a fourth-month interval.

A study by Keller-Margulis, Shapiro, and Hintze (2008), investigated the predictive

validity of the AIMSweb R-CBM measure in comparison to the Pennsylvania state assessment

and a nationally-normed achievement assessment for first- and third-grade students across two

years. Correlations with both assessments across both years ranged from .53 to .71. The results

showed R-CBM to be not only an effective screening tool but one that has long-term accuracy as

a growth measure for predictability on future high-stakes testing and future grade-level

achievement. Results showed that the spring R-CBM scores were predictive of 75.83% of the

student performance for the state assessment. Also, consistent with other studies, the authors

also found that correlation of the oral reading fluency measure decreased as the grade increased.

Through a review of cited studies, the authors also reported the AIMSweb R-CBM test-retest

reliability to be .82 with interrater reliability at .99.

When compared to another popular commercial curriculum-based program known as the

Dynamic Indicators of Basic Early Literacy Skills (DIBELS), there is evidence to support

AIMSweb as a better overall assessment for measuring growth over time for reading skills.

Ardoin and Christ (2009) conducted a study that compared the weekly growth and standard error of measurement and standard error of slope to determine the effectiveness of AIMSweb and DIBELS for measuring oral reading fluency. Results showed both assessments to demonstrate consistent oral reading performance and growth; however, the AIMSweb measures showed less measurement error (11.89) and standard error of slope (.71) than DIBELS (15.26 standard error and .91 standard error of slope) indicating that the quality of the AIMSweb oral reading fluency passages is higher.

Summary

For past several decades, there have been several theories developed to improve reading fluency by targeting the components of automaticity and accuracy. The bottom-up model was developed to address early components of reading related to letters and sound recognition, attentional processes, and memory processes so that automaticity and accuracy skills could be adequately achieved. Based on several theories within the bottom-up model, there is a need to further investigate the use of performance feedback data on reading fluency as a way to increase automaticity and accuracy.

The current research shows limited studies in using performance feedback data as the primary study focus. The available literature has shown performance feedback data to be mainly used in conjunction with other reading fluency methods. Because the results of those studies were inconclusive in determining the effects of performance feedback data, there is a need to increase the research regarding the effects of performance feedback data on oral reading fluency as a stand-alone method for reading fluency.

Because the provision of errors has been established as a theorized method to improve automaticity and accuracy for the bottom-up models, it is necessary to determine whether the

43

provision of the number of errors read, words read correctly, or both the number of errors read and the number of words read correctly have more of an effect on reading fluency. The available studies that have investigated performance feedback data as a stand-alone method or in conjunction with other reading fluency methods have shown an inconsistency on which feedback data method has had a more positive effect on reading fluency. Even further, there are limited studies that have used a commercially-available curriculum-based measure to track the rate of improvement and/or error rate on reading fluency despite research supporting the validity and reliability of these measures.

CHAPTER 3

METHODOLOGY

Introduction

The purpose of the study was to determine the effects of different forms of performance feedback on students' oral reading fluency using a curriculum-based oral reading fluency measure. The Reading Curriculum-Based Measurement (R-CBM) oral reading fluency measure from the AIMSweb progress monitoring system was used. The effectiveness of the reading intervention was determined by the rate of improvement (increase for number of words read correctly per minute over a specified time period) and the final score of words read correctly per minute. The effectiveness of performance feedback for four student groups was investigated: (a) Errors Group - students were provided with the number of errors made, (b) Words Correct Group- students were provided with the numbers of words read correctly, (c) Error + Words Correct Group - students were provided with both the number of errors made and the number of words read correctly, and (d) No Feedback Group - students were not provided with performance feedback.

The study site was an elementary school located in western Pennsylvania with a population of 55 teachers and 625 students (kindergarten through fifth grades) with a student racial constitution of 98% Caucasian and1% Multi-Racial with 42% of students receiving free and reduced lunches. Approval for the study procedures and participants was obtained through the Indiana University of Pennsylvania Instructional Review Board for the Protection of Human Subjects (see Appendix A).

Research Question and Hypotheses

The research question and hypotheses was as follows. Does the provision of performance feedback result in differential oral reading fluency rate of improvement (ROI or acceleration) and final level of words correct per minute in a second-grade sample of students, and if so, which type of feedback condition has the most effect on acceleration and on the final level of words correct per minute? It was hypothesized that the subjects in the Errors Group would display greater oral reading fluency acceleration and a higher final level of words correct per minute than the subjects in the Words Correct Group, the Errors + Words Correct Group, and the No Feedback Group after adjusting for pre-tests differences. It was also hypothesized that the subjects in the Words Correct group would display greater oral reading fluency acceleration and a higher final level of words correct per minute than the subjects in the Errors + Words Corrects Group and the No Feedback Group after adjusting for pre-test differences. Finally, it was hypothesized that subjects in the Errors + Words Correct Group would display greater oral reading fluency acceleration and a higher final level of words correct per minute than the subjects in the No Feedback Group after adjusting for pre-test differences.

Participants

Subjects in the study were both male and female second-grade students with a typical age range of 6- to 8-years old (114 students) who were instructed with the second-grade curriculum at a western Pennsylvania school district. The study included those second-grade students enrolled at the elementary school who participated in all curriculum-based assessments for the duration of the proposed study. Also participating in the study were five teachers who instructed second-grade students in a regular education classroom.

Reading Curriculum

The current second-grade core reading curriculum was the *MacMillan/McGraw-Hill 2001* reading series. According to the authors, the reading series provides guided instruction and development of phonological awareness skills, other phonics-based skills, and language arts (Flood et al., 2001). Explicit lessons are provided that involve activities related to blending, segmenting, rhyming, and letter sound development. Other topics of math, social studies, and science are connected to the phonics-based skills by providing readings that have incorporated those content areas. Language arts are further developed by writing lessons that incorporate spelling and grammar skills.

Saxon Phonics and Spelling programs is also used in second grade. *Saxon Phonics and Spelling* is published by Saxon, a division of Houghton Mifflin Harcourt publishing, and can be used as a stand-alone or supplemental program. The Florida Center for Reading Research (FCRR) describes *Saxon Phonics and Spelling* as having "k, 1st, and 2nd grade program focus on phonemic awareness, phonics, spelling, alphabetizing, handwriting, and fluency" (FCRR, n.d., p. 1). Lessons consist of alphabetizing practice, introduction of new sounds, spelling, and handwriting rules, followed by a review of previously-learned skills.

Although various aspects of the current second-grade curriculum allowed for guided teacher instruction and some feedback opportunities to the students, the current reading curriculum components were not among those recognized in the literature as specific skill-based and/or performance-based reading methods like performance feedback. The current curriculum does not include a standard and systematic provision of performance feedback data to the students as used for this study. The study provided additional and systematic performance feedback separate from the second-grade current reading curriculum. The provision of the

performance feedback method supported the extant literature which showed limited oral reading fluency programming that included the provision of performance feedback within early elementary reading curriculums.

Participant Selection

Subjects were initially selected based on their enrollment as second-grade students in the district. Final selection of the subjects was determined through an informed parent consent form and an informed student assent form.

An informed parent consent form was sent home to each subject's parents via the participating teacher. The informed parent consent form asked parents to review the consent form and to return the consent form to the subject's teacher within a specified time period via a return envelope. The return envelopes were addressed to the subject's teacher. The participating teacher collected the envelopes as they were returned and delivered them to the district early intervening teacher who then provided the student assent forms to each participating teacher.

After the specified time period for the return of the parent consent forms, a reminder letter was then sent home to each subject's parents via the participating teacher. The reminder letter included the consent form and a return envelope. The reminder letter asked parents to review the letter and to return the consent form within a specified time period via the return envelope addressed to each subject's teacher. The participating teacher then collected the envelopes as they were returned and delivered them to the district early intervening teacher who then provided the student assents forms to the participating teacher.

Final assent was obtained from the subject via an informed assent form. Each participating teacher presented and explained the assent form to each subject who had been indicated by the parent consent form to participate in the study. The participating teacher then

had the subject indicate on the assent form whether he or she would participate in the study. The

participating teacher then gave the assent forms to the district early intervening teacher who

prepared the master list of participating subjects.

Participating second-grade teachers were initially selected on a volunteer basis during a

faculty meeting prior to study implementation. The researcher, elementary principal, and early

intervening teacher presented the study procedures and details to the second-grade teachers.

Participating teachers were selected for fidelity checks through an informed teacher consent form

where the teacher indicated their agreement to participate or to not participate. All participating

teachers indicated on the consent form that he or she was in agreement to participate in the

fidelity checks during the study.

Instruments Used

Teacher Fidelity Checklist

To determine "the extent to which an intervention's core components have been

implemented (and differentiated from control conditions) as planned" (Nelson, Cordray,

Hulleman, Darrow, & Sommer, 2012, p. 377), participating teachers were asked to give their

permission for fidelity checks to be conducted during the study. The fidelity checklist (see

Appendix B) was generated by the researcher and included the main steps of the probe

administration and for the provision of performance feedback data. The main steps were listed in

one column with a second column to check whether or not the step was carried out with fidelity.

R-CBM Probe

The curriculum-based measure used in this study was the oral reading fluency measure

from the AIMSweb progress monitoring system. The alternate-form reliability of the R-CBM

had been determined to be at .70 or higher (Howe & Shinn, 2002). The AIMSweb manual (NCS

49

Pearson, Inc., 2012c) listed the alternate-form reliability form .94 to .95, the test-retest reliability at .93 to .95, split-half reliability from .93 to .95, the interrater reliability at .93 to.95, and the criterion validity at .53 to .81. Each R-CBM one-minute probe (see Appendix C example taken from http://www.aimsweb.com/wp-content/uploads/RCBM_Grade-1.pdf) was administered by the participating teacher via paper version and results were recorded electronically by the participating teacher into the AIMSweb database. The subjects were given a paper copy of the same probe and asked to read (using the appropriate script) the probe aloud for one minute. The participating teacher then scored the probe as stated in the AIMSweb manual and recorded errors and words correct per minute using a computer or electronic tablet connected to the Internet. The participating teacher then provided the subject the prepared performance feedback statement for the subject's assigned performance feedback group using the corresponding script. One probe was used per session for each subject. Each probe was used in the order provided by the AIMSweb monitoring program. No probes were repeated for any of the subjects throughout the study.

Script

The following scripts were used for each performance feedback group during each probe administration (NCS Pearson, Inc., 2012b):

1. Errors Group – Number of Errors Read

"Hello (student first name). Last time you read (provide number of errors from previous probe results) errors. Try to beat that on this reading. When I say Begin, start reading aloud at the top of this page. Read across the page (demonstrate by pointing across page). Try to read each word. If you come to a word you don't know, I'll tell it to you. Be sure to do your best reading. Are there

50

any questions?" Answer any questions the student may have. Say: "Begin."

   After the probe is stopped, say: "Stop." Then say to the student: "You read (provide number of errors) errors on this reading". If the error number is less than the previous administration, say: "Good job! You beat your last score. Thanks for reading today." If the error number is more than the previous administration, say: "Good job. You can try to beat your score next time. Thanks for reading today."

2. Words Correct Group – Number of Words Read Correctly

   "Hello (student first name). Last time you read (provide number of words read correctly from previous probe results) words correctly. Try to beat that on this reading. When I say Begin, start reading aloud at the top of this page. Read across the page (demonstrate by pointing across page). Try to read each word. If you come to a word you don't know, I'll tell it to you. Be sure to do your best reading. Are there any questions?" Answer any questions the student may have. Say: "Begin."

   After the probe is stopped, say: "Stop." Then say to the student: "You read (provide number words read correctly) words correctly on this reading." If the number of words read correctly is less than the previous administration, say: "Good job. You can try to beat your score next time. Thanks for reading today." If the number of words read correctly is more than the previous administration, say: "Good job! You beat your last score. Thanks for reading today."

3. Errors + Words Correct Group – Number of Errors Read and Number of Words Read Correctly

"Hello (student first name). Last time you read (provide number of errors from previous probe results) errors and read (provide number of words read correctly from previous probe results) words correctly. Try to beat both of those on this reading. When I say Begin, start reading aloud at the top of this page.   Read across the page (demonstrate by pointing across page). Try to read each word. If you come to a word you don't know, I'll tell it to you. Be sure to do your best reading. Are there any questions?" Answer any questions the student may have. Say: "Begin."

After the probe is stopped, say: "Stop." Then say to the student: "You read (provide number errors read) errors and read (provide number of words read correctly) words correctly on this reading."

If the error number is less than the previous administration, say: "Good job! You beat your last score." If the error number is more than the previous administration, say: "Good job. You can try to beat your score next time." If the number of words read correctly is less than the previous administration, say: "Good job. You can try to beat your score next time." If the number of words read correctly is more than the previous administration, say: "Good job! You beat your last score. Thanks for reading today."

4. No Feedback Group – No Feedback

"Hello (student first name). When I say Begin, start reading aloud at the top of this page. Read across the page (demonstrate by pointing across page). Try to read each word. If you come to a word you don't know, I'll tell it to you. Be sure

52

to do your best reading. Are there any questions?" Answer any questions the

student may have. Say: "Begin."

After the probe is stopped, say: "Stop." Then say to the student: "Good job!

Thanks for reading today."

Data Sheet

The teacher recorded the subject's number of errors and/or number of words correctly

using a provided paper data sheet (see Appendix D). The data sheet provided a reference for the

participating teachers so that they could more efficiently refer to the subject's previous

performance as indicated by each script. Dependent upon the subject's randomly assigned

feedback group, the subject's data sheet reflected the appropriate information to be recorded.

For example, those subjects assigned to the Errors Group, the data sheet for that feedback group

indicated only the number of errors read.

<div align="center">

Procedures to Collect Data

</div>

Experimental Treatment

Once the participating teachers provided the student assent forms to the district early

intervening teacher, the early intervening teacher then prepared a master list of participating

subjects and their corresponding assigned identification numbers. The district early intervening

teacher also assigned each participating teacher an identification number and organized the list

so that corresponding subject identification numbers were listed for each participating teacher

under the participating teacher's identification number. The district early intervening teacher set

up the AIMSweb electronic database with each assigned subject identification number. The

researcher, district early intervening teacher, and participating teachers had access to the

electronic AIMSweb database via a username and password assigned by the district early

intervening teacher. Because the district early intervening teacher set up the database using only the participating teacher and subject identification numbers assigned prior to study implementation, all subject identities remained anonymous to the researcher and all participating teacher identities remained confidential to the researcher.

The district early intervening teacher then provided the researcher with a list of the assigned subject numbers for each assigned participating teacher identification number. The early intervening teacher was instructed by the researcher to inform appropriate staff to suspend current progress monitoring procedures for second-grade subjects participating in the study. It was agreed upon by school staff that those subjects participating in study would receive assessments conducted during the study in place of their regular progress monitoring procedures. Once the study was completed, the regular progress monitoring procedures for those second-grade subjects would resume. The researcher then used a stratified randomization method to determine into which feedback group the subjects would be placed for each of the participating teachers. To ensure an even distribution of subjects per each feedback group for each participating teacher, the total number of subjects assigned per participating teacher was first divided by four (total number of feedback groups), which determined how many subjects would be placed into a feedback group for each participating teacher. For example, the first teacher had 11 subjects participating which resulted in three groups having three subjects each and one group having two subjects.

The number of subjects assigned to each feedback group per the first two participating teachers was determined by first assigning the largest number of subjects to the Errors Group, then the next largest to the Words Correct Group, then the next largest to the Errors + Words Correct Group, and then the next largest to the No Feedback Group. After the assignment of the

number of subjects per feedback group was completed for the first two participating teachers, the assignment of the number of subjects per group for the remaining three teachers was determined by the total number of subjects needed per feedback group to maintain an evenly distributed number of subjects across all feedback groups.

For example, after the assignment of the number of subjects per feedback group per the first two teachers, three subjects were determined to be needed for the Errors Group and four subjects were needed each for the remaining feedback groups for the third teacher in order to maintain an even distribution of subjects across feedback groups. This method was continued for the remaining two teachers, which resulted in a total number of 15 subjects assigned to the Errors Group, 16 subjects assigned to the Words Correct Group, 16 subjects assigned to the Errors + Words Correct Group, and 15 subjects assigned to the No Feedback Group.

The researcher then inputted each subject identification number for that participating teacher into an online random list generator (https://www.random.org/lists/) so that each identification number would be randomly listed. The researcher then assigned the first generated subject identification number to the first feedback group (Errors Group). The researcher continued by assigning the next randomly-generated subject identification number to all the needed subjects in the Errors Group and then to those needed subjects in the Words Correct Group, then to those needed subjects in the Errors + Words Correct Group, and finally to those needed subjects in the No Feedback Group. The researcher then conducted the same randomization process for each of the participating teachers for each of their feedback groups.

The researcher provided the early intervening teacher each participating teacher's roster with each subject's assigned feedback group. The district early intervening teacher then provided a list to each participating teacher of: participating teacher's assigned identification

number, each subject's name, each subject's corresponding assigned identification number, and each subject's corresponding performance feedback script and data sheet. Each subject's script was color coded according to his or her assigned feedback group. Each subject's script listed the subject's identification number and subject name to ensure that each teacher assessed the correct subject and accessed the correct subject identification number in the AIMSweb database. Each subject's corresponding data sheet was stapled behind the subject's script and listed the subject's identification number and subject name.

Next, the participating teachers developed a schedule to administer the probes twice weekly to each subject. Participating teachers were encouraged to schedule probe administrations during unstructured times such as before the first bell, during recess, and during independent classroom work. If probe administrations needed to occur during structured times, nonparticipating students and subjects waiting their turn were provided opportunities to engage in cooperative learning activities, co-teacher instruction, independent academic practice, and/or further exploration of instructional topics through computer research, worksheet activities, or reading materials so that loss of instructional time was minimized.

When subjects were assessed, the participating teacher called each subject individually to the designated testing area within or near the classroom. The participating teacher accessed the subject's identification number from the AIMSweb electronic database and selected the appropriate one-minute (R-CBM) probe. The participating teacher then introduced the R-CBM probe using the subject's color coded and labeled script. Using the appropriate script and data sheet, the participating teacher read aloud the subject's previous score and then read aloud the introduction of the R-CBM probe. The participating teacher then provided the subject the R-CBM probe via a paper version. The participating teacher then administered the R-CBM probe

to the subject by having the subject read the aloud the R-CBM probe for one minute. While the subject read aloud, the participating teacher electronically scored (according to the AIMSweb manual) the probe by silently following along with the subject using an electronic version of the R-CBM probe.

When the probe administration was completed, the participating teacher then accessed the subject's score from the database. The participating teacher then read to the subject his or her feedback using the using the subject's script for the subject's assigned performance feedback group. The participating teacher then recorded the subject's score onto the data sheet attached to his or her script so that the participating teacher could more efficiently reference the subject's results at the next session. Once the probe session was completed by the subject, the participating teacher had the subject return to his or her seat and called back the next subject until all probes were administered. For the first probe administered to each subject during session one for the Errors Group, Words Correct Group, and Errors + Words Correct Group, the participating teachers did not provide to the subject the steps from the script that referenced any previous probe administrations as these steps were not applicable for the first probe during the first session. For all remaining probe administrations, the scripts were read to all the subjects in those groups as initially provided to the participating teachers.

Each subject's session took approximately two to three minutes. The district early intervening teacher provided all the probe paper copies to the participating teachers. Prior to the distribution of the probes to the teachers, a label that included each session number and corresponding probe number was placed by the researcher on each probe sheet so that the participating teacher could more efficiently reference and cross check the paper probe copy with the probe selected in the AIMSweb program to better ensure administration of the correct probe.

The researcher developed a schedule based on the participating teachers' testing schedule to address student absence from scheduled probe administration. The schedule was then provided to the early intervening teacher who then provided the information to the participating teachers prior to beginning of the study. Also, in circumstances when the participating teacher was absent during regularly scheduled probe administrations, the district early intervening teacher administered and recorded results as stated for the participating teacher.

Assessment of Treatment Fidelity

Agreement by the participating teachers to participate in treatment fidelity checks was obtained through an informed teacher consent form. Subjects to be observed and the specific session of the observations were determined through a stratified randomization method conducted by the researcher. For each feedback group for each participating teacher, the researcher used a random list generator (https://www.random.org/lists/) to randomly list those subjects from each feedback group. The first subject listed for each feedback group per teacher was then selected as the subject to be observed during a fidelity check for a total of 20 subjects (one subject per feedback group per teacher). The initial fidelity checks occurred during the first and second weeks of the study (session one, two, three, or four). Assignment of selected subjects to session one, two, three, or four occurred by inputting all 20 selected subjects into the random list generator and then assigning session one to the first listed subject, then assigning session two to the second listed subject, then assigning session three to third listed subject, and then assigning session four to the fourth listed subject. The same pattern of session assignment was repeated until all subjects were assigned to a session.

The researcher then provided to the early intervening teacher the list of assigned sessions along with each subject's feedback group and assigned participating teacher. The early

58

intervening teacher then conducted the fidelity checks according to the schedule provided by the researcher. The participating teachers were notified by the early intervening teacher prior to each observation. The initial fidelity checks were conducted as proposed and resulted in 100% fidelity for all observations.

The follow-up fidelity checks occurred during week seven of the study (sessions 13 and 14). Because 100% fidelity occurred for all initial fidelity checks, one fidelity check per feedback group was conducted and subjects were selected so that a different feedback group was represented per teacher. A stratified randomization method was used to select a subject from each feedback group and to assign the selected subject to session 13 or 14 for the fidelity check. The researcher inputted each subject identification number for each feedback group into an online random list generator (https://www.random.org/lists/) so that each identification number would be randomly listed per feedback group.

Beginning with the Errors Group, the first subject listed was selected to be observed. For the next group of Words Correct, the second subject listed was selected for observation since the teacher for the first subject listed was already represented by the subject selected in the Errors Group. For the Errors + Words Correct Group, the first subject was selected since the teacher assigned to that subject had not yet been represented by the selection for the first two groups. For the No Feedback Group, the third subject listed was selected because the first two subjects listed were of teachers already selected during the first three feedback groups. The subject selected for the fifth teacher was the first student listed in the list generator as all four feedback groups were already represented by a selected subject. The assignment of session 13 or 14 to the selected subjects was determined by inputting all five selected subjects into the list generator. The first generated subject was assigned session 13 and the second listed subject was assigned

session 14. This assignment pattern continued with the third listed subject until all subjects were assigned. The researcher then provided the early intervening teacher the list of each selected subjects and their participating teacher along with the assigned session to conduct the fidelity checks for each selected subject. The early intervening teacher then conducted the follow-up fidelity checks. The participating teachers were notified by the early intervening teacher prior to each observation. A total of five fidelity checks (one check per teacher) were conducted. The follow up fidelity checks resulted in 100% fidelity for all observations.

The fidelity checklist consisted of four main steps determined by the researcher to be essential procedures for the provision of performance feedback for all performance feedback groups. For the first fidelity checks conducted during session one, the first step listed was not applicable as it pertained to the provision of previous probe results. For those fidelity checks conducted during session one, only the three remaining steps were considered essential procedures. A rating of 'non-applicable' was listed for the first procedure listed for those fidelity checks conducted during session one.

If a fidelity check would have indicated less than 100% of the steps administered, the district early intervening teacher would have informed the researcher who would have then instructed the early intervening teacher to reiterate the study procedures with each participating teacher who demonstrated less than 100% completion for any of the steps. If any of those subjects in which the fidelity checks would have been less than 100% accurate, the researcher would not have included any of the subject's data in the defense discussion. However, all 25 fidelity checks for the initial checks conducted indicated 100% fidelity as did all 5 checks for the second round of fidelity checks. Only the participating teacher and subject identification numbers were used on the fidelity checks so that all identifying information remained

60

anonymous to the researcher. The district early intervening teacher submitted all fidelity

checklists to the researcher.

Research Design

The study design was an experimental 2 x 2 factorial with two dependent measures as the

subject's oral reading fluency ROI (acceleration) and the subject's final score (total) of words

correct per minute as the dependent variables (Figure 1).

		Words Correct (WC)		
		Yes	No	Total ER
Errors (ER)	Yes	(ER+WC)	(ER)	
	No	(WC)	(No Feedback)	
	Total WC			Total Overall

Figure 1. Research design diagram using an experimental 2 x 2 factorial design.

Prior to the start of the study, a benchmark score was obtained for each subject as a

covariate. The benchmark assessment was completed for all subjects within two weeks prior to

the study. Each subject's ROI was calculated based only on the scores obtained during the study.

Any progress monitoring scores achieved by the subjects prior to the study were not included as

each subject was provided a schedule specific to the study that included only the scores obtained

during the study. After three the first three probe scores were obtained, the AIMSweb progress

monitoring system provided an ROI score after every probe administered based on the most

recent probe administered and all of the previously administered probes. The AIMSweb system

calculated each subject's ROI (trendline) using an ordinary least-squares regression (NCS

Pearson, Inc., 2012d). The ROI score used for analysis was the last ROI score calculated after

each subject's final session and was based on all of the assessed data collected during the

experimental treatment. The AIMSweb monitoring system also provided a score of words correct per minute achieved after every probe administered. The score used for this analysis was the final score reported after each subject's final session.

For the 2 x 2 factorial design, the independent variables were Errors (ER) and Words Correct (WC) with two levels per independent variable resulting in four cells. The first independent variable of ER had one level where subjects were provided with feedback about their errors (included the conditions of Errors + Words Correct Group and Errors Group) and a second level where subjects were not provided with feedback about their errors (included the conditions of Words Correct and No Feedback Group). The second independent variable of WC had one level where subjects were provided feedback about their words correct (included the conditions of Errors + Words Correct Group and Words Correct Group and a second level where subjects were not provided with feedback about their words correct (included the conditions of Errors Group and No Feedback Group).

The design included a covariate component that accounted for individual differences in oral reading fluency skills that could have existed prior to the experimental manipulation. The covariate was most recent benchmark score for each subject prior to the implementation of the study. The benchmark score for all subjects was obtained within two weeks prior to the start of the study which controlled for the maturation effect on the study results. The benchmark assessment was completed for all subjects within two weeks prior to the study. Each subject's ROI was calculated based only on the scores obtained during the study. Any subject progress monitoring scores achieved prior to the study were not included as each subject was provided a schedule specific to the study that included only the scores obtained during the study. Because a covariate was used, the statistical analysis focused on the adjusted means. The dependent

variables were adjusted according to how high or low the mean was for each performance feedback group on the covariate.

<div align="center">

Statistical Analysis of Data

</div>

Results were analyzed using the Statistical Package for the Social Sciences (SPSS), version 22 for Windows using a MANCOVA analysis. Each dependent variable was initially analyzed to ensure normal distribution. Other MANCOVA assumptions analyzed included whether there was linearity between the dependent variables, homogeneity of variances and covariances, and multicollinearity.

The multivariate results were first analyzed using the Wilks' Lambda value to determine whether the feedback conditions had a significant effect on the dependent variables (GROUP value). If the probability (p value) of the GROUP was less than the alpha level of 0.05, then the null hypothesis (adjusted means were equal) was rejected indicating there was differences among the adjusted means and that there was a significant effect. If a significant main effect was found, then follow-up ANCOVAs for each dependent variable were performed to determine whether the performance feedback conditions had a significant effect on either or both of the dependent variables. If the univariate GROUP p value for each dependent variable was less than .05, it was concluded that the feedback conditions had a significant effect on that specific dependent variable. Main effects and interactions between the feedback conditions were analyzed.

The effect size was measured by eta squared (η^2) function of SPSS (Cronk, 2008). The effect size was used to determine the proportion of the variance accounted for by each of the variables for the main effects and interactions (Gall, Gall, & Borg, 2007). According to Cohen (1992), the values and effects sizes for ANCOVA analyses are $<.2$ (small effect), $.2 - .8$ (medium effect), and $> .8$ (large effect).

CHAPTER 4

RESULTS

The intent of this study was to determine whether the provision of performance feedback impacts the acceleration rate of oral reading fluency and/or the final level of words read correctly for second-grade subjects who were administered one-minute oral reading fluency probes twice weekly for eight consecutive weeks. The research question was "Does the provision of performance feedback on errors read and/or words correct read result in differential oral reading fluency ROI (acceleration) and final levels of words correct per minute in a second-grade sample of students, and if so, which type of feedback condition has the most effect on acceleration and on the level of words correct per minute?"

It was hypothesized that the subjects in the Errors Group would display a greater final oral reading fluency acceleration score and a higher final level of words correct per minute score than the subjects in the Words Correct Group, the Errors + Words Correct Group, and the No Feedback Group after adjusting for pre-tests differences. It was also hypothesized that the subjects in the Words Correct group would display a greater oral reading fluency acceleration score and a higher final level of words correct per minute score than the subjects in the Errors + Words Corrects Group and the No Feedback Group after adjusting for pre-test differences. Finally, it was hypothesized that subjects in the Errors + Words Correct Group would display a greater oral reading fluency acceleration score and a higher final level of words correct per minute score than the subjects in the No Feedback Group after adjusting for pre-test differences. Results were analyzed using a MANCOVA and post hoc ANCOVAs with the benchmark score as the covariate.

64

Participant Complications

The study was completed with 62 second-grade subjects with 38 female subjects and 24 male subjects. Due to error in administration of the procedures by two participating teachers and one subject who left the district in the middle of the study, the data for 12 subjects could not be included in the study results. Teacher error in administration of the probes resulted from skipped probe administrations that were not made up according to the schedule for subject absences and from administrations in which probes were administered out of sequence and/or were administered twice. These errors were due to general teacher error and not due to errors because of the intervention protocol procedures. Subject mortality was primarily from the same teacher whose 11 subjects were not included because of teacher error for 10 subjects and 1 subject who moved away from the district. For one other teacher, 1 subject was not included due to teacher error.

A total number of 50 subject results were included in the study with 31 females and 19 males. Table 1 lists the independent variables and totals of male and female subjects for each of their two levels for each of the four feedback groups. Table 2 lists the average benchmark score for each of the four feedback groups.

Table 1

Sample Size and Sex of Subjects per Feedback Group

Independent Variable		Words Correct (WC)						Total
		Provided			Not Provided			Total
		Male	Female	Total	Male	Female	Total	
Errors (ER)	Provided	5	8	13	6	6	12	25
	Not Provided	5	8	13	3	9	12	25
	Total	10	16	26	9	15	24	50

Table 2

Average Covariate (Benchmark) Score as Words Read Correctly per Minute per Feedback Group

Independent Variable		Words Correct (WC)	
		Provided	Not Provided
Errors (ER)	Provided	82	71
	Not Provided	92	73

As stated in greater detail in Chapter 3, the fidelity of the probe administrations specific to each of the feedback groups was checked through the use of a fidelity checklist. The early intervening teacher completed 20 initial observations that occurred during the first, second, third, and fourth probe administrations within the first two weeks of the study. The early intervening teacher also conducted the five follow up observations which occurred during probe administrations 13 and 14 during week seven of the study. For all 25 fidelity checklists, 100% fidelity was achieved. Based on 100% fidelity observed for the administration of the probe procedures, the integrity of the data collected can be assumed and results can be interpreted with confidence.

Assumptions of the Statistical Analyses

Prior to analyses, the data were reviewed to determine if assumptions for MANCOVA were met. The assumptions consisted of: (a) continuous scale measurement for dependent and covariate variables, (b) two or more groups for each independent variable, (c) independence of observations – one subject per feedback group, (d) adequate sample size, (e) absence of significant outliers, (f) normal distribution of dependent variables, (g) homogeneity of variances

and covariances, (h) linearity of variables, and (i) absence of multicollinearity (Lund & Lund, 2013).

The assumption for data measured by a continuous scale was met for the dependent and covariate variables as these were interval data. ROI scores were calculated by the AIMSweb program using an ordinary least squares method. The final words correct per minute level for each subject were the number of words correct achieved by each subject based on the final probe administered. The covariate score for each subject was the fall second-grade level benchmark probe score (number of words correct per minute) obtained prior to the study. The assumption that the independent variables consist of two or more groups was met as there were two independent variables with two levels resulting in the four feedback conditions. Because each subject was randomly assigned to a feedback condition prior to the study, individual subject data were included in only one group which satisfied the assumption for independence of observations. The assumption for adequate sample sizes was also met as there were relatively an equal number of subjects per feedback group with totals per group greater than the number of dependent variables analyzed (Lund & Lund, 2013).

The assumptions for outliers and for normal distribution of the dependent variables were met through a visual inspection of the data generated through histograms and other graphs provided through the SPSS output. A review of each dependent variable's visual output did not indicate any significant outliers and a normal curve was indicated for both dependent variables. The Shapiro-Wilk Test of Normality was also conducted to determine normal distribution of the dependent variables. As indicated in Table 3, the results confirmed the visual inspection of the data and satisfied the assumption for normality ($p > .05$).

Table 3

Results of the Shapiro-Wilk Test of Normality for the Dependent Variables of ROI and Final Words Correct

Dependent Variable	Shapiro-Wilk Statistic	p
ROI	.98	.379
Final Words Correct	.98	.723

Results were also analyzed through SPSS for acceptable levels of skewness (deviation from symmetry) and kurtosis (degree of peak for normal curve; Spiegel & Stephens, 1999). Results presented in Table 4 showed both variables to be within acceptable range of -1.0 to 1.0 (Pagano, 2001).

Table 4

Results for Skewness and Kurtosis for the Dependent Variables of ROI and Final Words Correct

Dependent Variable	Skewness	Kurtosis
ROI	-.32	-.10
Final Words Correct	.14	-.54

The assumption that the variances for each dependent variable were equal across the groups was determined by Levene's Test of Equality of Error Variances test. As indicated in Table 5, for each dependent variable, the assumption was met as results for each variable were not significant ($p > .05$) indicating error variances were relatively equal.

Table 5

Levene's Test of Equality of Error Variances

Dependent Variable	Levene Statistic	p
ROI	.45	.717
Final Words Correct	.71	.549

To determine whether the assumption of homogeneity of covariance across the groups was satisfied, Box's Test of Equality of Covariance Matrices was performed. As indicated in Table 6, the assumption was satisfied as results, $p > .005$, indicated that there were no significant differences between the covariance matrices for the dependent variables (Huberty & Petoskey, 2000).

Table 6

Box's Test of Equality of Covariance Matrices

Box's M Statistic	*F*	*df1*	*df2*	*p*
21.93	2.244	9	23557.61	.017

Linearity of the variables in relation to each other was conducted through a visual inspection of the SPSS output of histograms, box plots, and stem and leaf results. Results showed linearity between the covariate and dependent variables thus satisfying the assumption for linearity.

Multicollinearity between the independent variables was analyzed through SPSS. Each independent variable was compared to determine whether the level of correlation between the independent variables was at an acceptable level. Acceptable levels of multicollinearity are indicated when the variance inflation factor (VIF) is from 1-9. Acceptable levels of tolerance are indicated when the tolerance levels are greater than .2 (O'Brien, 2007). As indicated in Table 7, the assumption for multicollinearity was met as both the VIF and tolerance levels for each of the independent variables were 1.0.

Table 7

Multicollinearity Results for the Independent Variable of Errors (ER) and Words Correct (WC)

	Collinearity Statistics	
Independent Variable	Tolerance	VIF
Errors (ER)	1.00	1.00
Words Correct (WC)	1.00	1.00

Tests of Hypotheses

The research question was, "Does the provision of performance feedback result in differential oral reading fluency rate of improvement (ROI or acceleration) and on the final level of words correct per minute in a second-grade subject sample, and if so, which type of feedback condition has the most effect on acceleration and on the final level of words correct per minute?" Three hypotheses were developed to determine whether the provision of errors, words correct, or both errors and words correct had a significant effect on the dependent variables. The descriptive statistics for the dependent variables of ROI and final level of words correct per minute prior to and after adjusting for pre-test differences using the covariate are presented in Table 8, Table 9, and Table 10.

Hypothesis One Results

It was hypothesized that the subjects in the Errors Group would display greater oral reading fluency acceleration and a higher final level of words correct per minute than the subjects in the Words Correct Group, the Errors + Words Correct Group, and the No Feedback Group. MANCOVA results did not indicate a significant interaction effect between ER and WC, $F(2,44) = 1.56$, $p = .222$. Further, ANCOVA results for both ROI, $F(1,45) = .39$, $p = .538$, and

Table 8

Descriptive Statistics for ROI for Four Feedback Conditions Prior to and After Adjusting for Pre-Test Differences

	ROI									ROI Adjusted								
	WC Provided			WC Not Provided			Total			WC Provided			WC Not Provided			Total		
Group	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SE*	*n*	*M*	*SE*	*n*	*M*	*SE*
ER Provided	13	1.93	1.07	12	1.94	1.36	25	1.93	1.20	13	1.93	.32	12	1.95	.34	25	1.94	.23
ER Not Provided	13	3.33	1.07	12	2.92	1.09	25	3.13	1.08	13	3.31	.33	12	2.93	.34	25	3.12	.23
Total	26	2.63	1.27	24	2.43	1.31	50	2.53	1.28	26	2.62	.23	24	2.44	.24	50	2.53	.17

Note. ROI = Rate of Improvement, ER = Errors, WC = Words Correct

Table 9

Descriptive Statistics for Final Level of Words Correct per Minute for Four Feedback Conditions Prior to Adjusting for Pre-Test Differences

| Group | | Final Words Correct | | | | | | | |
| | WC Provided | | | WC Not Provided | | | Total | | |
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
ER Provided	13	105.85	51.54	12	106.08	35.48	25	105.96	43.67
ER Not Provided	13	128.23	36.90	12	106.58	39.38	25	117.84	38.90
Total	26	117.04	45.39	24	106.33	36.66	50	111.90	41.37

Note. WC = Words Correct, ER = Errors

Table 10

Descriptive Statistics for Final Level of Words Correct per Minute for Four Feedback Conditions After Adjusting for Pre-Test Differences

| Group | | Final Words Correct Adjusted | | | | | | | |
| | WC Provided | | | WC Not Provided | | | Total | | |
	n	*M*	*SE*	*n*	*M*	*SE*	*n*	*M*	*SE*
ER Provided	13	103.42	3.87	12	114.94	4.06	25	109.18	2.80
ER Not Provided	13	115.92	3.93	12	113.69	4.05	25	114.80	2.89
Total	26	109.67	2.77	24	114.32	2.88	50	111.99	1.98

Note. WC = Words Correct, ER = Errors

final level of words correct per minute, $F(1,45) = 3.02$, $p = .089$, showed no significant

interaction between ER and WC, although the ANCOVA results for the interaction between ER

and WC for the final level of words correct per minute did approach significance, $p = .089$.

Therefore, comparisons between the individual feedback conditions were not carried out to

determine whether the Errors Group had higher acceleration and a higher level of final words

correct per minute than the other conditions. Thus, the hypothesis was not supported. The results

of a MANCOVA (Table 11) and ANCOVA post hoc tests conducted on these data are displayed

below (Table 12).

Table 11

Results of MANCOVA of Independent Variables Errors (ER) and Words Correct (WC) on Combined Dependent Variables ROI and Final Words Correct

Effect	Wilks' λ	F	Hypothesis df	Error df	p	η^2
WC	.931	1.62	2	44	.209	.069
ER	.774	6.44	2	44	.004	.226
ER * WC	.934	1.56	2	44	.222	.066

Note. WC = Words Correct, ER = Errors

Table 12

Post Hoc ANCOVA Results for Errors (ER) and Words Correct (WC) on ROI and Final Words Correct

Source	Dependent Variable	Mean Square	df	F	p	η^2
WC	ROI	.40	1	.29	.592	.006
	Final Words Correct	258.52	1	1.33	.255	.029
ER	ROI	17.26	1	12.73	.001	.221
	Final Words Correct	392.09	1	2.01	.163	.043
WC * ER	ROI	.52	1	.39	.538	.008
	Final Words Correct	588.78	1	3.02	.089	.063
Error	ROI	1.36	45			
	Final Words Correct	194.81	45			

Note. WC = Words Correct, ER = Errors

Hypotheses Two and Three Results

It was hypothesized that the subjects in the Words Correct Group would display greater

oral reading fluency acceleration and a higher final level of words correct per minute than the

subjects in the Errors + Words Corrects Group and in the No Feedback Group. It was also

hypothesized that the subjects in the Errors + Words Correct Group would display higher

acceleration and a higher final level of words correct per minute than the subjects in the No

Feedback Group. As previously stated, MANCOVA results did not indicate a significant

interaction effect between ER and WC, and post hoc ANCOVA results for both ROI and final

level of words correct per minute showed no significant interaction between ER and WC.

Therefore, comparisons between the experimental conditions (Words Correct Group versus the

Errors + Words Correct and No Feedback Groups and the Errors + Words Correct Group versus

the No Feedback Group) could not be made. Thus, the hypotheses were not supported.

Analysis of Main Effects for ROI and Final Level of Words Correct per Minute

While there was no significant interaction between ER and WC in the MANCOVA, a

significant main effect was found for the independent variable of Errors (ER), $F(2,44) = 6.44$, p

$=.004$, on the combined dependent variables even after controlling for pre-test differences. Post

hoc ANCOVA results were analyzed to determine whether the significant main effect for ER

was on one or both of the dependent variables. A significant between-subjects effect for ER,

$F(1,45) = 12.73$, $p = .001$, was found for the dependent variable ROI but was not found for the

dependent variable of final words correct per minute, $F(1, 45) = 2.01$, $p = .163$.

As presented in Table 8, the results showed that for the feedback conditions of ER in

which the provision of errors occurred (Errors Group and Errors + Words Correct Group), there

was a significantly smaller acceleration gain (total $M = 1.94$) when compared to the acceleration

gain (total $M = 3.12$) for the feedback conditions of ER where errors were not provided (Words

Correct Group and No Feedback Group). Thus, a significantly smaller acceleration occurred

when the provision of errors was provided. The effect size ($\eta^2 = .221$) for ER was considered a

small effect indicating that approximately 22% of the variance was accounted for from the

provision of errors. A significant main effect was not found in the MANCOVA for the

independent variable of Words Correct (WC), $F(2,44) = 1.62$, $p = .209$ and further ANCOVA

results did not indicate a significant between-subjects effect for WC for either the dependent

variable of ROI, $F(1,45) = .29$, $p = .592$, or for the dependent variable of final level of words

correct per minute, $F(1,45) = 1.33$, $p = .255$.

Summary of Results

Data were collected twice weekly from 50 second-grade subjects over eight consecutive

weeks for a total of 16 data collections per subject. Initial fidelity checklists conducted during

the first four sessions of the study and follow-up checks conducted during sessions 13 and 14 of

the study indicated 100% completion of the procedures for probe administrations, thus

confirming the integrity of the data collected.

Prior to conducting the MANCOVA analysis for the dependent variables, assumptions

for the analysis were checked. All assumptions were met.

To address the research question, a MANCOVA was conducted for the dependent

variables with univariate (ANCOVA) post hoc tests conducted. The ANCOVAs consisted of

two independent variables of ER and WC. Each independent variable consisted of two

independent factor levels that included the four feedback conditions. Main effects and

interactions between the feedback conditions were analyzed for each dependent variable.

MANCOVA results did not show a significant main effect for the provision of words correct nor

for the interaction between the provision of errors and words correct. ANCOVA results also indicated no significant effects for WC and ER x WC interaction on either of the dependent variables of ROI or final level of words correct per minute. However, MANCOVA results indicated a significant main effect for the provision of errors. ANCOVA results showed a significant effect was found for ER on the dependent variable of ROI but not for the final level of words correct per minute.

The hypotheses for the research question were not supported. Interactions between the experimental conditions could not be made as the MANCOVA results and post hoc ANCOVA results indicated no significant effects for the interaction between ER and WC. However, comparison of the total means for ER showed that the when the provision of errors was included in a feedback condition, ROI was significantly lower than when the provision of errors was not presented indicating a significant negative effect on acceleration for the provision of errors. ANCOVA results showed no significant effect for ER on the final level of words correct per minute.

Chapter 5

DISCUSSION

The goal for this study was to investigate the effect of four performance feedback conditions on the rate of improvement (ROI) and the final level of words correct per minute using a curriculum-based measure. The sample of population used for the study was 50 second-grade subjects who were administered curriculum-based probes twice weekly for eight weeks. The curriculum-based measure used was the second-grade level progress monitoring probes from the commercial AIMSweb progress monitoring program. The second-grade subjects were randomly assigned to one of the four feedback groups: (a) Errors Group, (b) Words Correct Group, (c) Errors + Words Correct Group, and (d) No Feedback Group. Prior to each probe administration, with the exception of the No Feedback Group, subjects were initially provided verbal feedback of their previous curriculum-based measure performance. Subjects were then administered an oral reading fluency probe according to a prepared script for each feedback group. Results for each administered probe were then provided verbally to the subjects (with the exception of the No Feedback Group) upon completion of the probe.

The research question and hypotheses were addressed using an experimental 2 x 2 factorial design analyzed by a multivariate analysis of covariance (MANCOVA) with the subject's oral reading fluency ROI (acceleration) and the subject's final score (total) of words correct per minute as the dependent variables with the covariant being the fall benchmark score for each subject. The fall benchmark score for all subjects was obtained within two weeks prior to the start of the study. Results were analyzed using two independent variables for the provision of errors and words correct with each independent variable having two independent levels that included all feedback conditions.

Results for Research Question and Hypotheses

Research Question Results

The overall research question asked whether there was an effect on the ROI and on the final level of words correct per minute when performance feedback was provided to a second-grade subject sample, and if so, which feedback condition had the most effect on acceleration and on the final level of words correct per minute. The combined dependent variables of ROI and the final level of words correct per minute were analyzed for main effects by the independent variables of the provision of errors and the provision of words correct. A main significant effect was found for the provision of errors. No significant main effect was found for the provision of words correct or for the interaction between the provision of errors and the provision of words correct.

Further analyses showed that the main effect for the provision of errors was found to be significant for only the dependent variable of ROI, thus the overall research question was answered in that there was an effect on acceleration when performance feedback for errors was provided. Specifically, it was found that the provision of errors had a significant negative effect on acceleration when included in a feedback condition. The overall research question was not supported for the final level of words correct per minute as no significant effect was found for the provision of errors.

Results also confirmed that there was no significant effect for the provision of words correct on either of the dependent variables nor was there a significant effect for the interaction between the dependent variables. Because no significant effect was found for the interaction between the dependent variables, determination of which feedback group had the most effect on

acceleration or on the final level of words correct per minute could not be analyzed; therefore, the research hypotheses could not be supported.

Hypothesis One Results

Hypothesis one stated that the Errors Group would display a higher acceleration and a higher final level of words correct per minute than the subjects in the Words Correct Group, the Errors + Words Correct Group, and the No Feedback Group. Because there was no significant interaction between the independent variables, comparisons between the individual feedback conditions were not analyzed to determine whether the Errors Group had higher acceleration and a higher level of final words correct per minute than the other conditions. Thus, the hypothesis was not supported.

However, because study results found a significant main effect for the provision of errors and further analysis showed a significant effect on the dependent variable of ROI, comparison of the total means for the independent variable involving the provision of errors was conducted. It was found that for the feedback conditions that included the provision of errors, a significant negative effect on acceleration occurred.

The results for the first hypothesis do not support the findings of the limited studies that have investigated performance feedback for errors as a stand-alone condition (Eckert et al., 2006; Thorpe et al., 1981). When compared to the results of previous studies, it should be noted that the procedures for this study involved a much larger number of subjects, provided all four feedback conditions as separate conditions, and consistently provided the feedback conditions to the same subjects across the duration of the study. Eckert et al. (2006) who investigated separate feedback conditions for the provision of errors, the provision of words correct, and no feedback found that the provision of errors produced greater or equal gains for oral reading fluency when

compared to the results for the other types of feedback conditions. However, Eckert et al.'s study only involved six second-grade subjects and did not investigate the provision of both the provision of errors and words correct, nor did it consistently provide the same type of feedback per session as the feedback type was randomly chosen for each session. The results of Eckert et al.'s study also differed from those results found by Thorpe et al. (1981) who found gains in oral reading fluency when only the provision of errors was provided compared to a baseline for the provision of no feedback. Thorpe et al.'s study differed in that the participants were 16 fifth-grade students who all attended the same learning support classroom, and the results were based on the use of the same passage for each session, and whose sessions were conducted daily over a 10-day period.

The negative effect on oral reading fluency acceleration found for in this study could be a result of providing the errors in only verbal form which differed from both Eckert et al. and Thorpe et al. who found gains for oral reading fluency when they provided errors in both verbal and graphical forms. For this study, subjects may have perceived the verbal provision of errors as punitive despite the use of a standard script for each feedback group that contained statements to encourage performance and to control for negative reactions from the subjects when given negative feedback (errors).

Research has shown that negative verbal feedback can have a negative effect on student motivation and achievement and the extent of the negative feedback can be dependent upon student characteristics such as ability level, emotional or behavioral levels, and personality traits. Zahorik (1970) found that student motivation is lowered when students are provided negative feedback that does not include statements on how to correct the incorrect response or further elaboration as to why the response is incorrect. Zahorik further found that just a restatement of

the incorrect response is less effective in increasing student motivation. Raftery and Bizer (2009) found that verbal negative feedback regarding performance on an initial visual/spatial test had a negative effect on subsequent visual/spatial tests for students who could not minimize the emotional impact of negative feedback and who instead internalized the negative feedback leading to poorer subsequent test performances. Cianci, Klein, and Seijts (2010) found that when students had a performance goal for reading comprehension and were presented with negative feedback regarding their performance on a reading comprehension task, students achieved lower performance on subsequent reading comprehension tasks due to the tension created by the negative feedback. This negative effect was even greater for students with a high conscientious personality trait.

Woo and Mix (1997) investigated how students with varying levels of self-esteem reacted to verbal feedback and how they perceived the feedback to affect their ability on subsequent performance tasks. Woo's and Mix's results showed that for students with high self-esteem who were provided negative feedback, these students attempted to engage in a process to try and reduce their perceived negative effect from feedback. Results on subsequent tasks showed that those students were unable to reduce the effect of the negative feedback as they obtained lower scores on the subsequent tests. Also for students with low-esteem who received negative feedback, those students immediately perceived that they would perform poorly on subsequent tasks and did not attempt to engage in a process to override the effect of the negative feedback. Gagne, Moore, Hauck, and Hoy (1979) found that a negative effect occurred on a follow up standardized achievement assessment for students with a high IQ who had received negative feedback regarding their performance on an initial standardized achievement assessment. The

negative feedback did not have a negative effect on a follow up standardized achievement assessment results for student students with low IQs.

To control for possible effects from student characteristics, a stratified randomization process was used in this study which randomly assigned subjects to each of the performance feedback groups. By randomly assigning subjects, equal distribution of the varying subject characteristics was attempted in order to reduce the effect from the subject characteristics.

Also, the results for this hypothesis suggest that procedures used in this study could be the best method for determining the effect of providing performance feedback for errors as several confounding factors that may have been present in other studies that investigated the effect on oral reading fluency when feedback on errors was provided were controlled. One confounding factor was the instructional practices of the participating teachers which have been shown to influence student achievement. Dibapile (2012) conducted a review of teacher instructional characteristics thought to impact student performance and concluded that teachers were more effective in promoting student achievement when they adequately plan instruction around schedules and understand the learning characteristics of their students and choose academic activities accordingly. For this study, the possible impact from the differing participating teachers' instructional practices was controlled through the use of a stratified randomization process that randomly assigned each subject to one of the four feedback groups.

Another confounding factor could have been the dynamics of the testing session related to the testing location, administration by the subject's teacher, and the use of a timed condition. Derr and Shapiro (1999) investigated the effect on oral reading fluency performance specific to testing conditions. Their results showed that when students were tested individually by their classroom teacher within the classroom under timed conditions they achieved higher words

82

correct per minute than for other testing conditions. Based on their findings, the procedures for

this study were in line with research to control for possible effects from the testing session

dynamics as subjects were tested by their teacher near or within their classroom under timed

conditions.

Finally, the differences in the subject oral reading fluency levels could have been a

confounding factor. However, unlike any of the other previous studies, those differences in oral

reading fluency skills were controlled for by the use of a covariate to reduce the effect of

possible oral reading fluency differences among the subjects. The use of the stratified

randomization process also provided a way to mitigate potential oral reading fluency differences

subjects by randomly distributing subjects across the feedback groups.

Hypothesis Two and Three Results

The second hypothesis stated that the Words Correct group would display greater oral

reading fluency acceleration and a higher final level of words correct per minute than the

subjects in the Errors + Words Corrects Group and the No Feedback Group. It was also

hypothesized that the subjects in the Errors + Words Correct Group would display higher

acceleration and a higher final level of words correct per minute than the subjects in the No

Feedback Group. As previously stated, results did not indicate a significant main effect for the

provision of words correct or between the provision of errors and the provision of words correct

on the combined dependent variables or for each of the dependent variables. Also, because

results for both the dependent variables of ROI and final level of words correct per minute

showed no significant interaction between the provision errors and words correct, no

comparisons between the experimental conditions (Words Correct Group versus the Errors +

Words Correct and No Feedback Groups and the Errors + Words Correct Group versus the No Feedback Group) were conducted. Thus, the hypotheses were not supported.

The results for the second hypothesis differed from the study by Conte and Hintze (2000) who found greater oral reading fluency gains for the provision of words correct when provided as a stand-alone condition. Conte's and Hintze's study differed in that their study involved 13 second-grade students who participated in two performance feedback data conditions that included the provision of the number of word read correctly and a condition of no feedback. Conte's and Hintze's results showed greater gains in oral reading fluency for the provision of words correct over the condition of providing no feedback. As previously mentioned, Eckert et al.'s study (2006) included a condition for the provision of words correct as a stand-alone condition. Their results differed from this study as the authors found higher oral reading fluency gains for one subject when compared to the condition of no feedback.

The results for the third hypothesis differed from McCurdy's and Shapiro's (1992) study which provided conditions for the provision of both errors and words correct and the provision of no feedback but did not include separate feedback conditions for the provision errors and for the provision of words correct. Their study involved 48 students from second through fifth grades, and results showed gains for oral reading fluency for the provision of both errors and words correct condition over the no feedback condition.

Similar to the results for hypothesis one, the results for the second and third hypotheses could have been affected by the choice to only provide the feedback to the subjects in only verbal form. Conte and Hintze (2008) and Eckert et al. (2006), who included a stand-alone condition for the provision of words correct, and McCurdy and Shapiro (1992), who included a stand-alone condition for the provision of both words correct and errors, provided the

performance feedback in both verbal and graphical forms. Because those study results showed gains for oral reading fluency, the provision of feedback in graphical form may ameliorate the negative effect from the provision of negative feedback (errors) in verbal form and may enhance the effect from the provision of positive feedback (words correct) in verbal form.

Also, the results for hypothesis two and three could have occurred as this study was more tightly controlled study than previous research studies that investigated the effect of words correct and both words correct and errors on oral reading fluency. Attempts to control confounding factors associated with the subjects and participating teachers as previously mentioned included the use of a stratified randomization process that distributed the subjects to across the feedback groups.

Limitations

There are several limitations that may have affected the internal validity of the study results. One limitation was that effect on student performance for the feedback groups may have been affected by instructional differences between the second-grade participating teachers such as delivery of classroom instruction, choice of curriculum materials, and/or amount of time spent on individual instructional topics all of which have been found to influence student achievement. A review by Dibapile (2012) concluded that increased student achievement occurs when teachers adequately prepare lessons within available times frames and plan instruction based on the learning characteristics of their students. However, as previously stated, the differing teacher practices that could have affected the results for this study were attempted to be mitigated through the use of a stratified randomization process that randomly assigned each subject to one of the four feedback groups.

A second possible limitation was that the subject performances for the feedback groups could have been impacted by factors associated with classroom characteristics that were present when subjects were assessed with the curriculum-based measures. Because all of the participating teachers chose to test the subjects within or near their classrooms, subjects may have been distracted by classroom noise and visual distractions associated with the location of the testing area, for which the literature has shown can affect achievement performance (Asiyai, 2014; Derr & Shapiro, 1999). However, for this study, the potential implication from classroom characteristics was reduced as the participating teachers chose to test during structured classroom time in which the students were engaged in academic activities reducing opportunities to create additional classroom distractions.

A third limitation that could have affected the study results was related to subject variables such as student maturity levels/growth during the study, the number of students who did not complete the study, and subject absenteeism. The maturation effect was attempted to be controlled for through use of a covariate which was the most recent benchmark score for each subject prior to the implementation of the study. The benchmark score for all subjects was obtained within two weeks prior to the start of the study which controlled for the maturation effect on the study results. Subject absenteeism was controlled for with use of an absentee schedule to ensure that sessions were made up and that the data collection schedule was maintained. Although control was limited for the number of students who did not complete the study, it should be noted that only one student was not able to complete the study due to moving out of the district.

A fourth limitation was the possibility that emotional factors were present when subjects were assessed with the curriculum-based probes. Subjects may have experienced anxiety or

nervousness in anticipation of their probe performance or may have experienced upset from a previous performance that carried over to the present probe performance (Chamberlain, Daly, & Spalding, 2011). As previously stated, subjects may have perceived the verbal feedback as negative which can affect student performance (Cianci et al., 2010; Gagne et al., 1979; Raftery & Bizer, 2009; Woo & Mix, 1997). However, for this study, subject anxiety and how information may have been perceived by the subject was controlled for by the use of positive feedback statements for all feedback scripts so that even when negative feedback was provided (errors), students were provided encouragement statements prior to probe performance and after probe performance. Also, the stratified randomization process for this study attempted to evenly distribute subjects with varying characteristics or traits that would have been affected by the provision of negative feedback.

A fifth limitation was that for those teachers in which observations would have occurred simultaneously due to the teachers similar testing schedules, those teachers would have known ahead of time that the early intervening teacher was going to attend a specific session since prior arrangements to avoid simultaneous administrations would have occurred. Those teachers may have had additional time to prepare for their observations resulting in a better administration performance than if they would not have had additional time to prepare for the observations. Therefore, the teacher fidelity checks may have been based on peak performance versus typical performance when administering the probes.

One delimitation of this study is that it was limited to second-grade subjects from one rural elementary school district located in western Pennsylvania, and the probes used for the study were unique to the second-grade level. Also, because specific groups such as those students with disabilities, student sex, and students who were receiving other remedial practices

or interventions were not investigated for this study, the effectiveness of performance feedback on specific groups within the second-grade population cannot be generalized. A second delimitation is that the study results are limited to the second-grade students and the AIMSweb system used for the study.

Implications for Research

The results of this study provided several implications for research. Further research should be conducted to determine the effect that the provision of negative feedback, such as errors, has on the gains for oral reading fluency when presented in combinations of verbal and visual forms. Currently, the literature is limited to studies that have investigated the provision of errors using different combinations of verbal and visual forms on oral reading fluency, particularly for studies for which the provision of errors was provided as a stand-alone condition. Because studies have investigated the effect of verbal and visual feedback on general students' academic performances, those studies could be used as a guide for directing future research.

As previously mentioned, Raftery and Bizer (2009) found that when students could minimize the emotional impact of verbal negative feedback, they achieved higher performances on a subsequent academic task versus those student who could not minimize the emotional impact of negative feedback and who instead internalized the negative feedback leading to poorer subsequent task performances. Cianci et al. (2010) found that when highly conscientious students received verbal negative feedback, their tension levels rose and those students showed lower achievement results on a subsequent reading comprehension task than less conscientious students who were not as affected by tension. Gagne et al. (1979) found that when students with higher cognitive functioning were provided verbal negative feedback, they showed higher achievement results for a follow up assessment versus students with lower cognitive functioning.

88

Although no specific studies reviewed investigated the effect on oral reading fluency for the only the provision of errors in visual (graphical) form, the literature does contain information on the effect of providing feedback in visual form. Carr (2008) surmised the importance of teachers helping students use visual supports such charts, checklists, writings, and rubrics to self-evaluate their academic performance so that the students can have a visual resource which provides long-lasting positive feedback as it can be referenced and studied when needed versus verbal feedback that is brief and less likely to be remembered at a later date. Siewart (2011) examined the effect of providing visual feedback to fifth-grade students based on their performance for a writing task. Visual feedback was provided by the number of smiley faces the student received on his or her paper and then was graphed for each student. It was found that the visual feedback improved student performances by providing a clear indicator of student performance that was readily available for reference to promote additional learning time for the student. Shirbagi and Kord (2008) investigated the of using four feedback conditions including verbal only, written only, verbal and written, and no feedback on pre- and post-test student intelligence test results. The study results showed that the conditions of written only and written and verbal together had the most effect on student performance.

Because there are limited studies that have investigated the provision of oral reading fluency performance feedback in different visual and verbal forms and because other studies have shown that providing multi-modal forms of performance feedback for general student performance are more effective than providing verbal feedback, future studies should explore the provision of performance feedback through visual form and combinations of verbal and visual (graphical) forms.

Specifically, studies should be conducted to determine if the provision of negative feedback in graphical form has a similar negative effect on oral reading fluency as when provided in verbal form. Future studies should investigate separate conditions of the provision of negative feedback in verbal form, the provision of negative feedback in graphical form, and the provision of negative feedback in both verbal and graphical forms. Additionally, because studies have shown that the provision of positive feedback (words correct) results in gains for oral reading fluency when provided in both verbal and graphical feedback, future studies should investigate separate conditions of the provision of positive feedback in verbal form, the provision of positive feedback in graphical form, and the provision of positive feedback in both verbal and graphical forms.

A secondary implication for research found by this study is whether the variable of acceleration was affected by various study parameters chosen for the study as the effects of these parameters were not directly investigated. The reviewed studies that investigated the effect of performance feedback on oral reading fluency gains have shown inconsistencies regarding the study duration, frequency of data collection points, number of participants, and grade level or age of subjects (Alber-Morgan et al., 2007; Ardoin & Christ, 2009; Christ et al., 2012; Conte & Hintze, 2000; Eckert et al., 2000; Eckert et al., 2002, Eckert et al., 2006; Graney & Shinn, 2005; Huang et al., 2008; Neddenriep et al., 2011; Spencer & Manis, 2010). Even for studies when performance feedback was not provided, oral reading fluency gains were found to occur at different time intervals along with minimums for data collection frequencies and study duration (Ardoin et al., 2013; Christ, 2006). Future studies should consider the investigation of the feedback conditions on acceleration for the parameters of study duration, frequency of data collection points, and grade level or age of subjects. Also, future research should be conducted

with larger samples sizes as ANCOVA results for the interaction between ER and WC for the final level of words correct per minute for this study did approach significance (p = .089) indicating that significance may have been reached if a larger sample size would have been used. Also, future studies should explore the a similar study without the use of the covariate as there were similar results for each of the dependent variable means prior to and after adjusting for pre-test differences indicating that the covariate may have masked other effects.

Another study parameter for further research consideration is the time frame for which studies regarding the effect of the four feedback conditions should be conducted. This study was conducted during the fall time period of the regular school year as research has shown oral fluency gains are the highest during this time period (Reschly et al., 2009; Stage & Jacobsen, 2001). Further, Christ, Silberglitt, Yeo, and Cormier (2010) found that when using the AIMSweb oral reading fluency probes as were used for this study, more growth occurs for early elementary students than older students and that growth is greater during the fall than the spring period. Future studies should be conducted during the winter or spring time periods within the regular school year to determine whether the study results hold true for the four performance feedback conditions.

Implications for Practice

Practices within the School Setting

One implication for practice found in the study is that teachers should refrain from providing students negative verbal performance feedback before or after the administration of curriculum-based measures as the study results showed that the provision of errors in verbal form had a negative effect on the acceleration for oral reading fluency. However, teachers could provide positive verbal feedback before or after the administration of curriculum-based measures

as the study results showed that the verbal provision of words correct whether as a stand-alone condition or paired with the provision of errors had a similar harmless effect as providing no verbal performance feedback. However, as discussed earlier, teachers should provide verbal or visual feedback during regular instructional practices as the feedback can have a positive effect on student performance if the feedback is accompanied by positive statements or praise and if the negative feedback is further explained by the teacher through oral explanations or through visual means such as written statements, graphs, or charts.

Another implication for practice is the need for teachers to follow current standardization procedures when using commercially-based curriculum-based measures. Standardization procedures for curriculum-based measures, such as those provided by the AIMSweb program used in this study, are essential to ensure that comparisons can be made universally for all students (Hasbrouck & Tindal, 2006). Results of the study showed that when standardization procedures for the AIMSweb probes were modified to allow for the provision of performance feedback, the provision of performance feedback had either a significant negative effect or a near equivalent effect as providing no feedback on the ROI for oral reading fluency probes. Therefore, by following standardized administration procedures, the negative effects from providing feedback are avoided.

The Practice of School Psychology

School psychologists are called upon to be instrumental as leaders in gathering data-based information and in guiding school administrators and school staff to appropriate academic interventions that improve outcomes for all types of learners (Ikeda, Neesen, & Witt, 2008). Because school psychologists are important contributors to intervention processes, school psychologists need be aware of the effects when providing verbal feedback during curriculum-

based measures so that they can inform and guide school staff to appropriate oral reading fluency interventions for students.

Another implication for school psychologists is the responsibility to educate school staff on appropriate standardization procedures when providing school staff training in the administration of curriculum-based measures such as AIMSweb (National Association of School Psychologists, 2010). The results of this study emphasized the importance of adhering to the AIMSweb standardization procedures of providing no feedback as modifications to those procedures resulted in either a significant negative effect or a near equivalent effect on the ROI for oral reading fluency probes.

Conclusions

The study results indicated that the provision of performance feedback for errors had an overall effect on acceleration but not on the final level or words correct per minute. Specifically, it was found that provision of feedback as errors had a negative effect on acceleration. Based on these results, it can be concluded that the provision of performance feedback as errors not only has an effect on oral reading fluency for second-grade subjects but that effect is negative in that acceleration was significantly smaller compared to other conditions in which negative feedback was not provided. Therefore, providing performance feedback as errors should not be used when implementing oral reading fluency interventions.

The results surprisingly did not show that provision of feedback of words correct to significantly increase acceleration or increase the final level of words correct per minute. It can be further concluded that the standardization requirement for curriculum-based measures in which no feedback is provided is best practice as the provision of feedback for errors resulted in a significantly smaller gain for acceleration and the provision of words correct did not show a

93

significant gain for acceleration or for the final level of words correct per minute. Therefore, the provision of performance feedback involving errors should not be used for oral reading fluency interventions and the standardization procedures for curriculum-based measures should be maintained.

Summary

The results of the study showed there was an effect from the provision of feedback for errors on acceleration but not on the final level or words correct per minute for the oral reading fluency of second-grade subjects. It was further found that the provision of errors had a significant negative effect on acceleration when included in a feedback condition. In contrast, the provision of errors in a feedback condition did not have an effect on the final level of words correct per minute for second-grade subjects. Also, the provision for words correct when included in a feedback condition did not have a significant effect on acceleration or on the final level of words correct per minute. Likewise, the provision of both errors and words correct when included in a feedback condition did not have a significant effect on acceleration or on the final level of words correct per minute.

The determination of which feedback group showed the most gains for acceleration and for the highest final level of words correct per minute could not be analyzed as there was no significant interaction between the provision of errors and the provision of words correct. Therefore, the hypothesis that the Errors Group would result in the greatest gains for acceleration and the highest final level of words correct over the other feedback conditions was not supported. Likewise, the hypothesis that the Words Correct would have the second highest results over the feedback conditions of Errors + Words Correct and No Feedback was not supported. Finally, the hypothesis that the Errors + Words Correct Group would have higher results for acceleration and

a higher final level of words correct per minute than the No Feedback Group was not supported. It was concluded that the provision of performance feedback is not beneficial for achieving positive outcomes for acceleration or final level words correct per minute for oral reading fluency interventions.

Overall, the results for this study indicate that the methods used for this study for the provision of errors may be the best test for the provision of errors as a stand-alone condition due to the procedures that were put in place to more effectively address confounding factors that may been present in past studies. The effect of instructional differences between the participating teachers and student characteristics were controlled for as near equal distribution of the feedback groups between the participating teachers was accomplished through a stratified randomization process. The effect due to differing student oral reading fluency abilities was controlled for by the use of the benchmark score as a covariate. Finally, the effect of negative feedback on student performance was controlled for through use of encouraging statements prior to and after probe administrations and through the randomization process for assignment of the feedback groups.

Because results showed a negative effect when the negative feedback (errors) was provided in verbal form, future studies should be conducted to explore the provision of feedback in verbal versus graphical form along and for varying combinations of these forms. Also future studies should be conducted to investigate the effect of the four feedback conditions when using different variations of the study parameters along with the effect of the feedback conditions when conducted during the winter and spring periods of the school year.

The study procedures showed that teachers should not use verbal performance feedback when implementing oral reading fluency interventions as the provision of errors has a negative effect on acceleration and the provision of words correct and the provision of both words correct

95

and errors a similar effect as providing no feedback. Because the study results showed that the provision of performance feedback did not result in gains for oral reading fluency when the standardization procedures for curriculum-based measures were modified, the standardization procedures for curriculum-based measures should be followed.

Implementation of this study provided a positive example to school psychologists for when they are required to collaborate and consult with school leaders and school staff regarding the implementation of oral reading fluency interventions that involve curriculum-based measures. As leaders for intervention implementation, school psychologists are called upon to provide research-based practices that provide positive outcomes for all students and encourage best practice regarding standardization procedures.

References

Abadiano, H. R., & Turner, J. (2005). Reading fluency: The road to developing efficient and effective readers. *The New England Reading Association Journal, 41*(1), 50-56.

Alber-Morgan, S. R., Ramp, E. M, Anderson, L. L., & Martin, C. M. (2007). Effects of repeated readings, error correction, and performance feedback on the fluency and comprehension of middle school students with behavior problems. *Journal of Special Education*, *41*, 17-30.

Allor, J. H., & Chard, D. J. (2011). A comprehensive approach to improving reading fluency for students with disabilities. *Focus on Exceptional Children*, *43*(5), 1-12.

Ardoin, S. P., & Christ, T. J. (2009). Curriculum-based measurement of oral reading: Standard errors associated with progress monitoring outcomes from DIBELS, AIMSweb, and an experimental passage set. *School Psychology Review, 38*, 266-283.

Ardoin, S. P., Eckert, T. L., Christ, T. J., White, M. J., Morena, L. S., January, S. A., & Hine, J. F. (2013). Examining variance in reading comprehension among developing readers: Words in context (curriculum-based measurement in reading) versus words out of context (word lists). *School Psychology Review, 42*, 243-261.

Asiyai, R. (2014). Students' perception of the condition of their classroom physical learning environment and its impact on their learning and motivation. *College Student Journal, 48*(4), 716-726.

Baker, S. K., Smolkowski, K., Katz, R., Fien, H., Seeley, J. R., Kame'enui, E. J., & Beck, C. T. (2008). Reading fluency as a predictor of reading proficiency in low-performing, high-poverty schools. *School Psychology Review*, *37*, 18-37.

Balfanz, R., Bridgeland, J. M, Bruce, M., & Fox, J. H. (2013). *Building a grad nation: Progress and challenge in ending the high school dropout epidemic - 2013 annual update*. Washington, D.C.: Civic Enterprises, the Everyone Graduates Center at Johns Hopkins University School of Education, America's Promise Alliance, and the Alliance for Excellent Education. Retrieved from http://www.civicenterprises.net/MediaLibrary/Docs/Building-A-Grad-Nation-Report-2013_Full_v1.pdf

Begeny, J. C., Krouse, H. E., Ross, S. G., & Mitchell, R. (2009). Increasing elementary-aged students' reading fluency with small-group interventions: A comparison of repeated reading, listening passage preview, and listening only strategies. *Journal of Behavioral Education*, *18*, 211-228.

Carr, S. C. (2008). Student and peer evaluation: Feedback for all learners. *Teaching Exceptional Children, 40*, 24-30.

Chafouleas, S. M., Martens, B. K., Dobson, R. L., Weinstein, K. S., & Gardner, K. B. (2004). Fluent reading as the improvement of stimulus control: Additive effects of performance-based interventions to repeated reading on students' reading and error rates. *Journal of Behavioral Education*, *13*, 67-81.

Chamberlain, S., Daly, A. L., & Spalding, V. (2011). The fear factor: Students' experiences of test anxiety when taking A-level examinations. *Pastoral Care in Education, 29*(3), 193-205. doi:10.1080/02643944.2011.599856

Christ, T. J. (2006). Short-term estimates of growth using curriculum-based measurement of oral reading fluency: Estimating standard error of the slope to construct confidence intervals. *School Psychology Review, 35*, 128-133.

Christ, T. J., & Silberglitt, B. (2007). Estimates of the standard error of measurement for curriculum-based measures of oral reading fluency. *School Psychology Review, 36,* 130-146.

Christ, T. J., Silberglitt, B., Yeo, S., & Cormier, D. (2010). Curriculum-based measurement of oral reading: an evaluation of growth rates and seasonal effects among students served in general and special education. *School Psychology Review, 39*, 447-462.

Christ, T. J., White, M. J., Ardoin, S. P., & Eckert, T. L. (2013). Curriculum-based measurement of reading: Consistency and validity across best, fastest, and question reading conditions. *School Psychology Review, 42,* 415-436.

Christ, T. J., Zopluoglu, C., Long, J. D., & Monaghen, B. D. (2012). Curriculum-based measurement of oral reading: Quality of progress monitoring outcomes. *Exceptional Children, 78*, 356-373.

Christ, T. J., Zopluoglu, C., Monaghen, B. D., & van Norman, E. R. (2013). Curriculum-based measurement of oral reading: Multi-study evaluation of schedule, duration, and dataset quality on progress monitoring outcomes. *Journal of School Psychology, 51,* 19-57.

Cianci, A. M., Klein, H. J., & Seijts, G. H. (2010). The effect of negative feedback on tension and subsequent performance: The main and interactive effects of goal content and conscientiousness. *Journal of Applied Psychology, 95*, 618-630. doi: 10.1037/a0019130

Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112,* 155-159. doi:10.1037/0033-2909.112.1.155

Conte, K. L., & Hintze, J. M. (2000). The effects of performance feedback and goal setting on oral reading fluency within curriculum-based measurement. *Diagnostique*, *25*, 85-98.

Coulter, G., Shavin, K. S., & Gichuru, M. (2009). Oral reading fluency: Accuracy of assessing

    errors and classification of readers using a 1-min timed reading sample. *Preventing*

    School Failure, *54*, 71-76.

Cronk, B. C. (2008). *How to use SPSS: A step-by-step guide to analysis and interpretation* (5th

    ed.). Glendale, CA: Pyrczak Publishing

Daly, III, E. J., Garbacz, S. A., Olson, S. C., Persampieri, M., & Ni, H. (2006). Improving oral

    reading fluency by influencing students' choice of instructional procedures: An

    experimental analysis with two students with behavioral disorders. *Behavioral*

    Interventions, 21, 13-30.

Daly, III, E. J., Hofstadter, K. L., Martinez, R. S., & Andersen, M. (2010). Selecting academic

    interventions for individual students. In G. G. Peacock, R. A. Ervin, E. J. Daly III, and K.

    W. Merrell (Eds.), *Practical handbook of school psychology: Effective practices for the*

    21st century (pp. 115-134). New York, NY: The Guilford Press.

Daniel, M. H. (2010). Reliability of AIMSweb reading curriculum-based measurement (R-CBM)

    (oral reading fluency). *NCS Pearson, Inc.* Retrieved from http://www.aimsweb.com/wp-

    content/uploads/Summary-of-Reliability-Information-for-AIMSweb-R-CBM.pdf

Deno, S. L. (1985). Curriculum-based measurement: The emerging alternative. *Exceptional*

    Children, *52*, 219-232.

Derr, T. F., & Shapiro, E. S. (1989). A behavioral evaluation of curriculum-based assessment of

    reading. *Journal of Psychoeducational Assessment, 7*, 148-160.

    doi:10.1177/073428298900700205

Dibapile, W. S. (2012). A review of literature on teacher efficacy and classroom

    management. *Journal of College Teaching & Learning, 9*, 79-92.

Eckert, T. L., Ardoin, S. P., Daisey, D. M., & Scarola, M. D. (2000). Empirically evaluating the effectiveness of reading interventions: The use of brief experimental analysis and single case designs. *Psychology in the Schools*, *37*, 463-473.

Eckert, T. L., Ardoin, S. P., Daly, III, E. J., & Martens, B. K. (2002). Improving oral reading fluency: A brief experimental analysis of combining an antecedent intervention with consequences. *Journal of Applied Behavior Analysis*, *35*, 271-280.

Eckert, T. L., Dunn, E. K., & Ardoin, S. P. (2006). The effects of alternate forms of performance feedback on elementary-aged students' oral reading fluency. *Journal of Behavioral Education*, *15*, 149-162. doi:10.1007/s10864-006-9018-6

Eckert, T. L., Dunn, E. K., Codding, R. S., Begeny, J. C., & Kleinmann, A. E. (2006). Assessment of mathematics and reading performance: An examination of the correspondence between direct assessment of student performance and teacher report. *Psychology in the Schools, 43*, 247-265.

Ehri, L. C. (2005). Learning to read words: Theory, findings, and issues. *Scientific Studies of Reading, 92*, 167-188.

Flood, J., Lapp, D., & Fisher, D. (2005). Neurological impress method plus. *Reading Psychology, 26,* 147-160. doi: 10.1080/0270270590930500

Flood, J., Medearis, A., Hasbrouck, J. E., Paris, S., Hoffman, J. V., Stahl, S., . . . Wood, K. D. (2001). *McGraw-Hill reading: Teacher's edition*. New York, NY: McGraw-Hill School Division.

Florida Center for Reading Research. (n.d.). *Saxon phonics and spelling k-3*. Retrieved from http://drfreeman.webs.com/documents/SaxonPhonicsSpelling.pdf

Florit, E., & Cain, K. (2011). The simple view of reading: Is it valid for different types of alphabetic orthographies? *Educational Psychology Review, 23*, 553-576. doi: 10.1007/s10648-011-9175-6

Fuchs, L. S., & Deno, S. L. (1994). Must instructionally useful performance assessment be based in the curriculum? *Exceptional Children*, *61*, 15-24.

Fuchs, L. S., & Fuchs, D. (1993). Formative evaluation of academic progress: How much growth can we expect? *School Psychology Review*, *22*, 1-27.

Fuchs, L. S., & Fuchs, D. (2002). Curriculum-based measurement: Describing competence, enhancing outcomes, evaluating treatment effects, and identifying treatment nonresponders. *Peabody Journal of Education (0161956X)*, *77*, 64-84. doi:10.1207/S15327930PJE7702_6

Fuchs, L. S., & Fuchs, D. (2011). Using CBM for progress monitoring in reading. *National Center on Student Progress Monitoring*. Retrieved from http://files.eric.ed.gov/fulltext/ED519252.pdf

Fuchs, L. S., Fuchs, D., Hosp, M. K., & Jenkins, J. R. (2001). Oral reading fluency as an indicator of reading competence: A theoretical, empirical, and historical analysis. *Scientific Studies of Reading*, *5*, 239-256.

Fuchs, L. S., Fuchs, D., & Maxwell, L. (1988). The validity of informal reading comprehension measures. *Remedial and Special Education, 9,* 20-28. doi: 10.1177/074193258800900206

Fuchs, L. S., Fuchs, D., & Stecker, P. M. (1989). Effects of curriculum-based measurement on teachers' instructional planning. *Journal of Learning Disabilities*, *22*, 51-59.

Gagne, E. D., Moore, J. W., Hauck, W. E., & Hoy, R. V. (1979). The effect on children's performance of a discrepancy between adult expectancy and feedback statements. *The Journal of Experimental Education, 47*, 320-324.

Gall, M. D., Gall, J. P., & Borge, W. R. (2007). *Education research: An introduction.* (8th ed.). Boston, MA: Pearson Education.

Gough, P., B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education, 7*, 6-10. doi: 10.1177/074193258600700104

Graney, S. R., & Shinn, M. R. (2005). Effects of reading curriculum-based measurement (R-CBM) teacher feedback in general education classrooms. *School Psychology Review*, *34*, 184-201.

Good, III, R. H., & Jefferson, G. (1998). Contemporary perspectives on curriculum-based measurement validity. In M. R. Shinn (Ed.), *Advanced applications of curriculum-based measurement* (pp. 61-88). New York, NY: Guilford Press.

Guzel-Ozmen, R. (2011). Evaluating the effectiveness of combined reading interventions on improving oral reading fluency of students with reading disabilities. *Electronic Journal of Research in Educational Psychology*, *9*, 1063-1086.

Hasbrouck, J., & Tindal, G. A. (2006). Oral reading fluency norms: A valuable assessment tool for reading teachers. *The Reading Teacher*, *59*, 636-644. doi:10.1598/RT.59.7.3

Heckelman, R. G. (1969). A neurological-impress method of remedial-reading instruction. *Intervention in School and Clinic, 4,* 277-282. doi: 10.1177/105345126900400406

Hintze, J. M., & Shapiro, E. S. (1997). Curriculum-based measurement and literature-based reading: Is curriculum-based measurement meeting the needs of changing reading curricula? *Journal of School Psychology*, *35*, 351-375.

Hosp, J. L. (2008). Best practices in aligning academic assessment with instruction. In A.

   Thomas & J. Grimes (Eds.), *Best practices in school psychology V* (pp. 363-376).

   Bethesda, MD: National Association of School Psychologists.

Hosp, M. K., & MacConnell, K. L. (2008). Best practices in curriculum-based evaluation in early

   reading. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology V* (pp.

   377-396). Bethesda, MD: National Association of School Psychologists.

Howe, K. B., & Shinn, M. M. (2002). *Standard reading assessment passages (RAPs) for use in

   general outcome measurement: A manual describing development and technical features*.

   Eden Prairie, MN: Edformation.

Huang, L. V., Nelson, R. B., & Nelson, D. (2008). Increasing reading fluency through student-

   directed repeated reading and feedback. *The California School Psychologist, 13,* 33-40.

Huberty, C. J., & Petoskey, M. D. (2000). Multivariate analysis of variance and covariance. In H.

   A. Tinsley & S. D. Brown (Eds.), *Handbook of applied multivariate statistics and

   mathematical modeling* (pp. 183-208). San Diego, CA: Academic Press.

Hudson, R. F., Lane, H. B., Pullen, P. C. (2005). Reading fluency assessment and instruction:

   What, why, and how? *The Reading Teacher, 58,* 702-714. doi:10.1598/RT.58.8.1

Ikeda, M. J., Neesen, E., & Witt, J. C. (2008). Best practices in curriculum-based evaluation in

   early reading. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology V*

   (pp. 103-114). Bethesda, MD: National Association of School Psychologists.

Individuals with Disabilities Education Improvement Act, 20 U.S.C. § 1400 (2004).

Jenkins, J. R., Fuchs, L. S., van den Broek, P., Espin, C., & Deno, S. L. (2003). Sources of

   individual differences in reading comprehension and reading fluency. *Journal of

   Educational Psychology*, *95*, 719-729.

Jenkins, J. R., & Jewell, M. (1993). Examining the validity of two measures for formative

      teaching: Reading aloud and maze. *Exceptional Children, 59,* 421-432.

Jenkins, J. R., & Larson, K. (1978). *Evaluating error correction procedures for oral reading*

      (Report No. 55). Champaign, IL: University of Illinois at Urbana-Champaign Center for

      the Study of Reading.

Keller-Margulis, M. A., Shapiro, E. S., & Hintze, J. M. (2008). Long-term diagnostic accuracy of

      curriculum-based measures in reading and mathematics. *School Psychology Review*, *37*,

      374-390.

Kuhn, M. R., Schwanenflugel, P. J., & Meisinger, E. B. (2010). Aligning theory and assessment

      of reading fluency: Automaticity, prosody, and definitions of fluency. *Reading Research*

      Quarterly, *45*, 230-251.

LaBerge, D., & Samuels, S., J. (1974). Toward a theory of automatic information processing in

      reading. *Cognitive Psychology, 6*, 293-323.

Lerner, J. W. (2003). *Learning disabilities: Theories, diagnosis, and teaching strategies* (9th ed.).

      Boston, MA: Houghton Mifflin.

Lo, Y., Cooke, N. L., & Starling, A. L. (2011). Using a repeated reading program to improve

      generalization of oral reading fluency. *Education and Treatment of Children*, *34*, 115-

      140.

Logan, G. D. (1997). Automaticity and reading: Perspectives from the instance theory of

      automatization. *Reading & Writing Quarterly, 13*, 123-146.

Lund, A., & Lund, M. (2013). *One-way MANOVA in SPSS*. Retrieved from

      https://statistics.laerd.com/spss-tutorials/one-way-manova-using-spss-statistics.php

Mangano, N. G. (1983). *The effects of teacher explanation and questioning patterns on fourth grade students during basal reader instruction.* Paper presented at the Annual Meeting of the National Reading Conference, Austin, TX.

Marr, M. B., Algozzine, B., Nicholson, K., & Dugan, K. K. (2011). Building oral reading fluency with peer coaching. *Remedial and Special Education, 32,* 256-264. doi: 10.1177/0741932510362202

Marston, D. B. (1989). A curriculum-based measurement approach to assessing academic performance: What it is and why do it. In M. R. Shinn (Ed.), *Curriculum-based measurement: Assessing special children* (pp. 18-78). New York, NY: Guilford Press.

McCurdy, B. L., & Shapiro, E. S. (1992). A comparison of teacher-, peer-, and self-monitoring with curriculum-based measurement in reading. *Journal of Special Education*, *26*, 162-180.

Mraz, M., Nichols, W., Caldwell, S., Beisley, R., Sargent, S., & Rupley, W. (2013). Improving oral reading fluency through readers theatre. *Reading Horizons, 52,* 163-180.

Musti-Rao, S., Hawkins, R. O., & Barkely, E. A. (2009). Effects of repeated readings on the oral reading fluency of urban fourth-grade students: Implications for practice. *Preventing School Failure, 54*, 12-23.

Nathan, R. G., & Stanovich, K. E. (1991). The causes and consequences of differences in reading fluency. *Theory Into Practice*, *30*, 176-184.

National Association of School Psychologists. (2010). *Principles for professional ethics.* Retrieved from http://www.nasponline.org/standards/2010standards/1_%20Ethical%20Principles.pdf

National Institute of Child Health and Human Development. (2000). *Report of the national reading panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups.* (NIH Publication N. 00-4754). Washington, DC: Government Printing Office.

NCS Pearson, Inc. (2001). *R-CBM grade 1 sample.* Retrieved from http://www.aimsweb.com/wp-content/uploads/RCBM_Grade-1.pdf

NCS Pearson, Inc. (2012a). *Aimsweb introductory guide*. Retrieved from https://aimsweb.pearson.com/downloads/AIMSweb_introguide.pdf

NCS Pearson, Inc. (2012b). *Aimsweb progress monitoring guide.* Retrieved from https://aimsweb.pearson.com/downloads/AIMSweb2.0/Aimsweb_Progress_Monitor_Guide.pdf

NCS Pearson, Inc. (2012c). *Aimsweb: Reading curriculum-based measurement reading administration and scoring guide.* Retrieved from https://aimsweb.pearson.com/downloads/AIMSweb2.0/RCBM_UG.pdf

NCS Pearson, Inc. (2012d). *Aimsweb technical manual.* Retrieved from https://aimsweb.pearson.com/downloads/AIMSweb_TM.pdf

Neddenriep, C. E., Fritz, A. M., & Carrier, M. E. (2011). Assessing for generalized improvements in reading comprehension by intervening to improve reading fluency. *Psychology in the Schools*, *48*, 14-27. doi:10.1002/pits.20542

Nelson, M. C., Cordray, D. S., Hulleman, C. S., Darrow, C. L., & Sommer, E. C. (2012). A procedure for assessing intervention fidelity in experiments testing educational and

behavioral interventions. *Journal of Behavioral Health Services & Research*, *39*, 374-396. doi:10.1007/s11414-012-9295-x

No Child Left Behind (NCLB) Act of 2001, Pub. L. No. 107-110, § 115, Stat. 1425 (2002).

Noell, G. H., Gansle, K. A., Witt, J. C., Whitmarsh, E. L., Freeland, J. T., LaFleur, L. H., . . . Northrup, J. (1998). Effects of contingent reward and instruction on oral reading performance at differing levels of passage difficulty. *Journal of Applied Behavior Analysis, 31*, 659-663.

O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity, 41,* 673-690. doi: 10.1007/s11135-006-9018-6

Orçan, M., & Özmen, E. R. (2012). Determining effective intervention packages on improving reading fluency of the students with mental retardation. *Ozel Egitim Dergisi, 13*(1), 55-57.

Pagano, R. R. (2001). *Understanding statistics in the behavioral sciences* (6th ed.). California: Wadsworth/Thomson Learning.

Paige, D. D. (2011). "That sounded good!": Using whole-class choral reading to improve fluency. *The Reading Teacher, 64,* 435-438. doi: 10.1598/RT.64.6.5

Paige, D. D., Rasinski, T. V., & Magpuri-Lavell, T. (2012). Is fluent expressive reading important for high school readers? *Journal of Adolescent & Adult Literacy, 56*, 67-76.

Pearson Education, Inc. (2013). *Aimsweb*. Retrieved from www.aimsweb.com/wp-content/uploads/Pearson_aimsweb_web_spread.pdf

Poncy, B. C., Skinner, C. H., & Axtell, P. K. (2005). An investigation of the reliability and standard error of measurement of words read correctly per minute using curriculum-

based measurement. *Journal of Psychoeducational Assessment, 23,* 326-388. doi: 10.1177/073428290502300403

Powell-Smith, K. A., & Bradley-Klug, K. L. (2001). Another look at the "C" in CBM: Does it really matter if curriculum-based measurement reading probes are curriculum-based? *Psychology in the Schools*, *38*, 299-312. doi:10.1002/pits.1020

Raftery, J. N., & Bizer, G. Y. (2009). Negative feedback and performance: The moderating effect of emotion regulation. *Personality and Individual Differences, 47*, 481-486.

Rasinski, T. V. (2012). Why reading fluency should be hot! *The Reading Teacher, 65*, 516-522.

Rasinski, T. V., & Hoffman, J. V. (2003). Oral reading in the school literacy curriculum. *Reading Research Quarterly, 38*, 510-522.

Rasinski, T., Rikli, A., & Johnston, S. (2009). Reading fluency: More than automaticity? More than a concern for the primary grades? *Literacy Research and Instruction, 48,* 350-361.

Reschly, A. L., Busch, T. W., Betts, J., Deno, S. L., & Long, J. D. (2009). Curriculum-based measurement oral reading as an indicator of reading achievement: A meta-analysis of the correlational evidence. *Journal of School Psychology*, *47*, 427-469.

Samuels, S. J. (1979). The method of repeated reading. *The Reading Teacher, 32*, 403–408.

Shaywitz, S. E., & Shaywitz, B. A. (2004). The new science of reading and its implications for the classroom. *Education Canada*, *44*(1), 20-23.

Shinn, M. R. (2007). Identifying students at risk, monitoring performance, and determining eligibility within response to intervention: Research on educational need and benefit from academic intervention. *School Psychology Review*, *36*, 601-617.

Shinn, M. R. (2008). Best practices in using curriculum-based measurement in a problem-solving

    model. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology V* (pp. 243-

    262). Bethesda, MD: National Association of School Psychologists.

Shinn, M. R. (2013). Measuring general outcomes: A critical component in scientific and

    practical progress monitoring practices. *Pearson Education, Inc*. Retrieved from

    http://www.aimsweb.com/wp-content/uploads/Mark-Shinn-GOM_Master-Monitoring-

    White-Paper.pdf

Shinn, M. H., & Good III, R. H. (1992). Curriculum-based measurement of oral reading fluency:

    A confirmatory analysis of its relation to reading. *School Psychology Review*, *21*, 459-

    480.

Shirbagi, N., & Kord, B. (2008). Using different feedbacks in formative evaluation and their

    effects on achievement in Iranian elementary school students. *Journal of Behavioural

    Sciences*, *18*, 1-16.

Siewert, L. (2011). The effects of written teacher feedback on the academic achievement of fifth-

    grade students with learning challenges. *Preventing School Failure, 55*, 17-27.

Spear-Swerling, L. (2006). Children's reading comprehension and oral reading fluency in easy

    text. *Reading and Writing*, *19*, 199-220. doi:10.1007/s11145-005-4114-x

Speece, D. L., & Ritchey, K. D. (2005). A longitudinal study of the development of oral reading

    fluency in young children at risk for reading failure. *Journal of Learning Disabilities, 38*,

    387-399.

Spencer, S. A., & Manis, F. R. (2010). The effects of a fluency intervention program on the

    fluency and comprehension outcomes of middle-school students with severe reading

    deficits. *Learning Disabilities Research & Practice, 25*, 76-86.

Spiegel, M. R., & Stephens, L. J. (1999). *Schaum's outline of theory and problems of statistics* (3rd ed.). New York, NY: McGraw-Hill.

Stage, S. A., & Jacobsen, M. D. (2001). Predicting student success on a state-mandated performance-based assessment using oral reading fluency. *School Psychology Review, 30*, 407-419.

Stecker, P. M., Fuchs, L. S., & Fuchs, D. (2005). Using curriculum-based measurement to improve student achievement: Review of research. *Psychology in the Schools, 42*, 795-819.

Swain, K. D., Leader-Janssen, E. M., & Conley, P. C. (2013). Effects of repeated reading and listening passage preview on oral reading fluency. *Reading Improvement*, *50*, 12-18.

Therrien, W. J. (2004). Fluency and comprehension gains as a result of repeated reading. *Remedial and Special Education*, *25*, 252-261.

Thorpe, H. W., Chiang, B., & Darch, C. B. (1981). Individual and group feedback systems for improving oral reading accuracy in learning disabled and regular class children. *Journal of Learning Disabilities*, *14*, 332-334, 367.

Torgesen, J., Houston, D., Rissman, L., & Kosanovich, M. (2007). *Teaching all students to read in elementary school: A guide for principals*. Portsmouth, NH: RMC Research Corporation, Center on Instruction.

Uhry, J. K., & Clark, D. B., (2004). *Dyslexia: Theory & practice of instruction* (3rd ed.). Austin, TX: Pro-Ed, Incorporated.

VanDerHeyden, A. M. (2010). Analysis of universal academic data to plan, implement, and evaluate schoolwide improvement. In G. G. Peacock, R. A. Ervin, E. J. Daly III, and K.

W. Merrell (Eds.), *Practical handbook of school psychology: Effective practices for the 21st century* (pp. 33-47). New York, NY: Guilford Press.

Welsch, R. G. (2006). Increase oral reading fluency. *Intervention in School and Clinic*, *41*, 180-183.

Woo, T. O., & Mix, P. (1997). Self-enhancing reactions to performance feedback in an academic setting. *Journal of Social Behavior and Personality*, *12*, 481-500.

Yildiz, M., Yildirim, K., Ates, S., & Cetinkaya, C. (2009). An evaluation of the oral reading fluency of 4th graders with respect to prosodic characteristic. *International Journal of Human Sciences, 6,* 353-360. doi: 10.1080/19388070802468715

Zahorik, J. A. (1970). Pupils' perception of teachers' verbal feedback. *The Elementary School Journal, 71*, 105-114.

Zainal, Z. (2003). Critical review of reading models and theories in first and second languages. *The Asian Journal of Humanities, 10*, 104-124.

IUP Indiana University of Pennsylvania
www.iup.edu

Institutional Review Board for the
Protection of Human Subjects
School of Graduate Studies and Research
Stright Hall, Room 113
210 South Tenth Street
Indiana, Pennsylvania 15705-1048

P 724-357-7730
F 724-357-2715
irb-research@iup.edu
www.iup.edu/irb

July 10, 2014

Jill Little
1673 Glendale Lake Rd.
Patton, PA 16668

Dear Ms. Little:

Your proposed modifications to your previously approved research project, "The Effects of Performance Feedback on Oral Reading Fluency," (Log No. 14-008) have been reviewed by the IRB and are approved. In accordance with 45CFR46.101 and IUP Policy, your project is exempt from continuing review in addition to the approval of your request for changes.

You should read all of this letter, as it contains important information about conducting your study.

Now that your project has been approved by the IRB, there are elements of the Federal Regulations to which you must attend. IUP adheres to these regulations strictly:

1. You must conduct your study exactly as it was approved by the IRB.

2. Any additions or changes in procedures must be approved by the IRB before they are implemented.

3. You must notify the IRB promptly of any events that affect the safety or well-being of subjects.

4. You must notify the IRB promptly of any modifications of your study or other responses that are necessitated by any events reported in items 2 or 3.
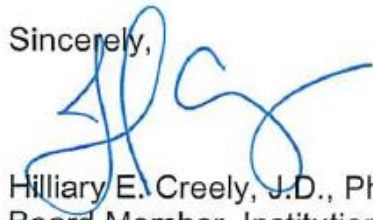
The IRB may review or audit your project at random *or* for cause. In accordance with IUP Policy and Federal Regulation (45CFR46.113), the Board may suspend or terminate your project if your project has not been conducted as approved or if other difficulties are detected.

It is strongly recommended that all researchers and their advisors complete CITI on-line protection of human subjects and responsible conduct of research training. The training is available at http://www.iup.edu/page.aspx?id=93408 and there is no charge to you.

I wish you success as you pursue this important endeavor.

Sincerely,

Hilliary E. Creely, J.D., Ph.D.
Board Member, Institutional Review Board for the Protection of Human Subjects
Assistant Dean for Research

HEC:jeb

Cc: Dr. Joseph Kovaleski, Dissertation Advisor

Fidelity Checklist

Participating Teacher ID#: _____ Date: _____

Subject ID#: _____ Feedback Group Name: _____

Probe#: _____ Session #:_____

Task	Yes	No
Teacher used the script to provide student previous probe results.		
Teacher administered probe to student using standardized procedures.		
Teacher recorded results into electronic database.		
Teacher provided the results to the student using the correct feedback script.		

Sample AIMSweb R-CBM Probe

(taken from http://www.aimsweb.com/wp-content/uploads/RCBM_Grade-1.pdf)

Two mice lived in the walls of Tim's house. One was named Bill. The other was named Ray. Bill and Ray slept in the wall next to Tim's bed. Every night, Tim could hear them running around. Every night, Tim had a hard time falling asleep because Bill and Ray made a lot of noise.

One night, Bill and Ray made too much racket. It sounded like they were dancing in the walls. Tim stood up on his bed and pounded the wall with his fist. "Hey Bill and Ray, be quiet. I can't sleep," he told them. "I have a big test at school tomorrow. I need my rest."

The mice were quiet for a little while. Then, they started making noise again. Tim could hear them crawling around in the walls. He rolled over in bed and turned on his light.

"What am I going to do? How can I keep the mice quiet?" Tim asked himself.

"You can give us some pillows and a blanket."

Tim turned his head. There was a mouse standing next to a hole in the wall.

"We make so much noise because we're cold." Ray said. If you would share some of your blankets with us, we could all go to sleep."

Tim gave each mouse a sock to use as a blanket. He gave them cotton balls to use as pillows. Then they all went to sleep.

Data Sheet

ERRORS GROUP – Data Sheet

SUBJECT NAME: _____

STUDENT ID# :_____

Session #	Date	Number of Errors Read

WORDS CORRECT GROUP - Data Sheet

SUBJECT NAME: _____

STUDENT ID# :_____

Session #	Date	Number of Words Read Correctly

ERRORS + WORDS CORRECT GROUP - Data Sheet

SUBJECT NAME: _____

STUDENT ID# :_____

Session #	Date	Number of Errors Read	Number of Words Read Correctly