INSTRUCTIONAL EFFECTIVENESS VERSUS EFFICIENCY: A COMPARISON OF
THREE TYPES OF CORRECTIVE FEEDBACK FOR
ORNAL READING FLUENCY INSTRUCTION

A Thesis
Presented in Partial Fulfillment of the Requirements for
The Degree Master of Arts in the
Graduate School of The Ohio State University

By
Kristen McLeod, B.A.

*****

The Ohio State University
2005

Master’s Examination Committee:
Dr. Laurice M. Joseph, Adviser
Dr. Antoinette Miranda

Approved By

College of Education
ABSTRACT

The most frequent type of referral to school psychologists concerning students with academic problems is in the area of reading (Joseph, 2002a). More specifically, reading fluency is considered the most common characteristic of problem readers (Adams, 1990). The purpose of this investigation was to provide educators with information regarding a successful type of corrective feedback procedure to use during oral reading fluency instruction to help children read with greater accuracy and fluency. In particular, the current study investigated the effects of three specific types of delayed corrective feedback for words read incorrectly during repeated readings (oral reading fluency instruction) of connected text to identify which technique was most effective and which was most time efficient for improving student's oral reading fluency and word identification skills. Methods of corrective feedback included: phonic analysis (i.e. word boxes), interspersal of unknown to known words, and traditional drill. Nine third grade students participated in the study upon referral from special education and general education teachers for additional intervention services in reading.

Results indicated that children achieved cumulative gains in learning under each of the three corrective feedback procedures. Albeit, in the area of instructional effectiveness, the traditional and interspersal methods most effectively increased participants cumulative
reading fluency, and the traditional and phonic analysis procedures, aided in most effectively increasing participants cumulative word identification. The traditional approach was most efficient for improving both fluency and word recognition.
Dedicated in memory of my grandmother, Alfreda McLeod, and in honor of my niece Katie.

Grandma,
Thank you for helping me to understand the importance of happiness in life, and for teaching me about angels in heaven, which represent hope.

Katie,
Always remember how special you are.
I love you very much.
ACKNOWLEDGMENTS

I would like to thank my advisor, Dr. Laurice Joseph, for her guidance and assistance, without which this project would not have been possible.

I wish to thank Dr. Antoinette Miranda for serving on my masters examination committee.

I am grateful to my parents, Christine and Lawrence McLeod, for their unconditional love and support. I am very fortunate to have them by my side.

I am thankful to Bennett, for his encouragement and faith in me. Also, for the laughter we have shared.

I thank my only big brother, Larry (one is just enough).
VITA

June 17, 1979. Born - Euclid, Ohio

2002. B.A. Psychology, Bowling Green State University

2002. B.A. Sociology, Bowling Green State University

2003 – present. Graduate Student, School Psychology, The Ohio State University

2004 – present. Graduate Teaching Associate, The Ohio State University

FIELDS OF STUDY

Major Field: Education
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Dedication</td>
<td>iv</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>v</td>
</tr>
<tr>
<td>Vita</td>
<td>vi</td>
</tr>
<tr>
<td>List of Tables</td>
<td>ix</td>
</tr>
<tr>
<td>List of Figures</td>
<td>x</td>
</tr>
</tbody>
</table>

**Chapters:**

1. Introduction                          | 1    |
2. Methodology                           | 28   |
3. Results                               | 43   |
4. Discussion                            | 57   |

**List of References**                   | 70   |

**Appendices:**

Appendix A: Treatment Integrity Checklist: Repeated Readings and Word Box | 77   |
Appendix B: Treatment Integrity Checklist: Incremental Rehearsal          | 80   |
Appendix C: Treatment Integrity Checklist: Traditional Whole Word Recognition......82
Appendix D: Incremental Rehearsal Script.........................................................84
Appendix E: Word Box Script...........................................................................86
Appendix F: Traditional Word Recognition Script.............................................88
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Means and Ranges of Words Read by Group</td>
<td>44</td>
</tr>
<tr>
<td>3.2</td>
<td>Means and Ranges of Learning Rates of Reading Fluency by Group</td>
<td>46</td>
</tr>
<tr>
<td>3.3</td>
<td>Means and Ranges of Words Learned by Group</td>
<td>48</td>
</tr>
<tr>
<td>3.4</td>
<td>Means and Ranges of Learning Rate of Word Identification by Group</td>
<td>50</td>
</tr>
<tr>
<td>3.5</td>
<td>Means and Ranges of Words Read by Individual</td>
<td>52</td>
</tr>
<tr>
<td>3.6</td>
<td>Means and Ranges of Words Learned by Individual</td>
<td>54</td>
</tr>
<tr>
<td>3.7</td>
<td>Pre-Assessment, Progress Monitoring, and Post-Assessment Fluency by Individual</td>
<td>55</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Cumulative Words Read (Instructional Effectiveness)</td>
<td>47</td>
</tr>
<tr>
<td>3.2</td>
<td>Cumulative Learning Rate of Reading Fluency (Efficiency)</td>
<td>47</td>
</tr>
<tr>
<td>3.3</td>
<td>Cumulative Words Learned (Instructional Effectiveness)</td>
<td>51</td>
</tr>
<tr>
<td>3.4</td>
<td>Cumulative Learning Rate of Word Identification (Efficiency)</td>
<td>51</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

The most frequent type of referral concerning students with academic problems is in the area of reading (Joseph, 2002a). Children who have difficulty in reading often have not acquired important precursor or component skills needed to become good readers. Research suggests that the basic precursor skill of word recognition, if underdeveloped, leads to slow laborious reading or reading dysfluency (Aaron et al, 1999). Reading fluency is considered the most common characteristic of problem readers (Adams, 1990). The purpose of this study was to provide educators with information regarding the effectiveness (cumulative words learned) and efficiency (cumulative learning rate) of three types of corrective feedback to improve fluency and word identification skills during oral reading instruction. If educators can provide effective and efficient feedback for struggling readers during oral reading instruction children have the potential to gain precursor skills such as word identification and fluency and will naturally improve reading ability as a result.

Characteristics of Children with Reading Problems

Students with reading difficulties can be identified as either poor readers or low ability readers (Joseph, 2002a). These two types of children with reading problems are easily
discernable when looking at student's cognitive ability or IQ and reading achievement. As indicated by experts in the diagnosis and treatment of reading disabilities, poor readers are children who have IQ-reading achievement discrepancies (Joseph, 2002a; Vellutino, Fletcher, Snowling, & Scanlon, 2004). That is, there is a tendency for poor readers to have average to high cognitive ability, but exhibit noticeable deficits in reading achievement. This type of problem reader may for example be lacking the critical reading skills of proficient readers such as, word recognition or decoding, which is the ability to pronounce a written word by relating the letters to the sounds of the word (Aaron, Joshi, & Williams, 1999) (including phonological processing), reading speed (fluency), and comprehension (understanding what one is reading). According to Aaron & Joshi (1992) these skill deficits are characteristic of poor readers and include children with developmental dyslexia. Dyslexia is a neurological impairment often associated with deficits with one or a combination of two or more of the formerly presented reading skills (Aaron & Joshi).

The second type of reading problem, accounts for the largest number of children with reading problems (Joseph, 2002a). These are low ability readers. As indicated by Joseph (2002a) unlike poor readers, low ability readers tend to have lower than average cognitive ability, and below grade level reading skills such as word recognition, comprehension, and/or fluency. Perhaps the most important finding relevant to the current study is related to a similarity found between poor readers and low ability readers. That is, "empirical evidence suggests there is no difference between these two groups and how they develop reading precursor skills" (Wristers, Francis, Foorman, Fletcher, & Swank, 2000 as cited in Joseph, 2002a, p.2). In fact, all children learn to read much the same way, by learning
specific precursor skills as they develop the ability to read. Vellutino et al. (2004) concluded poor and normal readers do not differ considerably in skills that underlie reading ability. Therefore, children who excel in reading and conversely those with reading difficulties both develop the same specific prerequisite skills in the acquisition of reading ability.

All children eventually develop or fail to develop the same component reading skills. Reading instruction can then be implemented to improve any one or a combination of the component skills deficits identified in children with reading problems. For example, children might be identified as having skill deficiencies in one or more of the following areas: phonemic awareness, the application of letter-sound correspondence rules (Joseph Best practices & Vellutino et al., 2004), word identification (word recognition) and reading fluency, the ability to read text accurately and quickly (Armbruster & Osborn, 2001). These skills are necessary, but not sufficient, precursors to becoming a good reader (Vellutino et al., 2004).

Primary Components of Reading

The reading process is mediated by many components (Aaron, Joshi, & Williams, 1999). Each component can be broken down even further into a host of prerequisite reading skills (i.e. phonemic awareness). Components are independent of one another, meaning any component of reading can fail to develop normally contributing to a reading problem, while other components remain intact (Aaron et al., 1999). Research dating back to 1986, conducted by Gough and Tunmer, identified at least two essential components of reading, namely decoding and comprehension. Decoding skills are also referred to as word recognition skills. On the basis of a factor analysis study, Levy and
Carr (1990) found word recognition and comprehension skills to be dissociable. Therefore, students can exhibit difficulty with word recognition skills or comprehension skills mutually exclusively or in both areas.

More recently, Aaron et al. (1999) conducted four studies investigating whether all children with reading disabilities share a common etiology in only the aforementioned component skill areas of decoding and comprehension, or if other factors also contribute to problems in reading. Results indicated that, reading disabilities also result from deficiencies in orthographic processing and reading speed. The former refers to an individual’s sensitivity to constraints on how the letters in written language are organized to make meaningful words (i.e. ‘at’ in ‘sat’, ‘cat’, and ‘mat’) (Vellutino et al., 2004). The latter can be described as the time it takes to read words aloud (Aaron et al.) presented in a reading passage. Overall the study concluded that major components skills of reading include decoding and comprehension with orthographic processing and reading speed a probable third component. All components are dissociable and more than one kind of reading disability exists, because as Aaron et al. (1999) ascertain, any one of these components can remain delayed while others develop normally.

Word Recognition and Reading Problems

Why do some children have difficulty learning to read? Would you believe that reading difficulties could be predicted from children’s inability to recognize words in isolation, even before reading is presented in connected text? Vellutino et al. (2004) defined reading as the process of constructing meaning from written text. According to a review of research by Vellutino et al. (2004) evaluating historical hypothesized causes of specific reading disabilities over the past four decades, reading is a complex process that
depends on sufficient development of two important processes, namely word identification and comprehension. Word identification involves the visual recognition of an ordered array of letters as a familiar word (including the name and often the meaning of the word) and its retrieval from memory (Vellutino et al., 2004). As previously described, word identification is the ability to correctly pronounce a word with relationship to the letters and sounds of a word. So, in order to comprehend (or understand) what one reads, one must be able to identify words contained in a text with enough accuracy and fluency to allow for the text to take on meaning (Vellutino et al., 2004). Deficient word recognition has been shown to inhibit reading fluency, which contributes to reading comprehension skill deficits and ultimately poor reading (Gough & Tunmer, 1986; Perfetti, 1885; Snowling, 2000; Stanovich, 1991; Vellutino, Scanlon, & Chea, 1995; Vellutino, Scanlon, Sipay, Small, Pratt, & Chen et al., 1996). A review of research on the etiology of reading disabilities suggests that, “the most basic and most ubiquitous cause of difficulties in learning to read is inadequate facility in word identification, which itself, appears to be caused by basic difficulty in learning to decode print” (Vellutino et al., 2004).

Word recognition is strongly associated with reading fluency and further to the development of skilled reading. That is, “children who have difficulty recognizing words accurately are also slow in reading words (in text)” (Aaron et al., 1999, p.152). Word recognition has been established as a necessary prerequisite to efficient reading. According to Joshi & Aaron (2002) the inability to decode written words fluently and effortlessly will certainly inhibit the acquisition of successful reading performance.
Fluency Leads to Improved Reading

"The importance of oral reading fluency as a necessary dimension of proficient reading has recently received renewed attention" (Zutell & Rasinski, 2001, p. 211). Reading fluency is the ability to read text accurately and quickly (Armbruster & Osborn, 2001). Fluency develops as children learn to be good decoders. As children learn to rapidly recognize the name and meaning of words, reading speed naturally increases. "More fluent readers focus their attention on making connections among the ideas in a text and between these ideas and their background knowledge. Therefore, they are able to focus on comprehension" (Armbruster & Osborn, 2001, p. 22). Less fluent readers, on the other hand, must focus their attention primarily on decoding individual words. Therefore, they have little attention left for comprehending the text (Armbruster & Osborn, 2001).

Children who are not fluid in their reading are slow when they read simply because reading comes to a halt with each unfamiliar word they come across. As a result, the child spends too much time decoding individual words, and is unable to concentrate on understanding the reading passage as a whole. As children are taught word identification skills (i.e. by sounding out the phonemes or sound units in a word or recognizing a word by sight) their reading fluency progresses along with their comprehension. Hence, children become much better readers as their reading fluency improves.

It seems, lack of reading fluency leads to problems in reading. According to Adams (1990), perhaps the most common characteristic of problem readers is reading fluency. By definition, reading dysfluency (a slow rate of reading) (Mastropieri, Leinart, & Scruggs, 1999) inhibits good reading performance because children read less text in the same amount of time than do more fluent readers, and as a result will have processed less
text (Mastropieri et al., 1999). Furthermore, as described above, slower readers most likely put more cognitive resources into identifying individual words than students who read with more automaticity, and therefore fewer cognitive resources are available to process the meaning of the text (LaBerge & Samuels, 1974; & Samuels, 1987). Reading dysfluency has been shown to contribute to problems with reading comprehension (Fuchs & Fuchs, 1992) and no amount of comprehension skills training can correct the problem of slow labored rate of reading (Henk, Helfeldt, & Platt, 1986, as cited in Mastropieri, et al., 1999).

The obvious conclusion being, if educators would like to help children with reading problems increase both comprehension and fluency rates than instructional techniques should be aimed at the source of the problem, namely reading fluency and word recognition. If children learn decoding strategies and word recognition skills, then research indicates reading fluency and ultimately reading comprehension will improve as a result and children will become better readers.

**Oral Reading Instruction**

Let us turn now to oral reading instruction and its relationship to the development of reading fluency. The practice of oral reading instruction can be seen in school classrooms across the country in the form of small group reading instruction (Hoffman & Isaacs, 1991). Children are typically grouped by reading ability relative to classmates. Groups according to reading ability may be divided into grade level readers, who can be observed reading aloud effortlessly in one group, and those students who struggle while reading; pausing frequently, stumbling over words, and often having to be prompted and provided words by their teachers as they read in a distinctively separate reading group. In oral
reading instruction classroom setting, children are often observed take turns reading
(Hoffman & Isaacs, 1991); one turn ends and another begins, as each student listens to
fellow classmates read aloud and waits for his or her turn. The teacher commonly
provides immediate assistance as student readers struggle to decode words, by providing
the correct word to the student so that he or she can continue reading. Round robin is one
approach to guided oral reading instruction and it is carried out very similarly to that of
the small reading group scenario provided above.

One method proven to help student increase reading fluency, is the technique of
guided oral repeated readings, described below as a commonly used principle for
teaching reading fluency. Empirical evidence suggests that guided oral repeated readings,
including frequent practice and feedback have a significant impact on accuracy, fluency,
and comprehension (Sample, 2005). Many approaches to oral reading instruction have
been used to help children improve word identification skills, although this study focuses
on the oral instruction with word boxes, a phonic analysis technique, which has been
implemented in helping students identify the letter-sound correspondences in words
(Joseph & Devault, 2004). Guided oral repeated reading and word boxes are also
discussed below as methods found to improve reading fluency and accuracy of word
recognition.

Principles for Teaching Reading

Repeated Readings. In recent years, fluency as a critical component of competent
reading and fluency intervention has gained the attention of both researchers and
practitioners (Thaler, Ebner, & Heinz, 2004). Fluency is the ability to read smoothly and
effortlessly (Clark, 1995) with freedom from word recognition problems and dealing with
words in connected text with quickness (as cited in Rasinski & Padak, 1994). As previously described, a substantial amount of empirical evidence indicates dysfluent readers have a deficit in word recognition, which contributes to their slow and laborious rate of reading (Mastropieri, Leinart, & Scruggs, 1999; Adams, 1990; Joshi & Aaron, 2002; & Vellutino et al., 2004).

The research of Samuels (1979, 1988, & 1997) has been at the forefront of reading fluency instruction. Samuels (1985) introduced repeated readings as an instructional technique for improving reading fluency. “The method consists of rereading a short, meaningful passage several times until a satisfactory level of fluency is reached. Then the procedure is repeated with a new passage” (as cite in Samuels, 1997, p. 377). For example, a reading fluency criterion of 90 words per minute might be established. In this case, a child would reread a passage, for several one-minute intervals, until the criterion was met, then the child would move to the next passage, with all passages being at the child’s instructional level, a passage that is challenging but manageable text for the reader (Armbruster & Osborn, 2001).

According to Samuels (1997) and Moyer (1982) fluency is made up of two components, which are accuracy of word recognition and reading speed. Repeated readings increase reading speed by the child practicing or familiarizing him or herself with the words in connected text, further as accuracy of word recognition increases with each repeated reading, reading speed is also improved. Fluency improvements are dramatic and children are excited by the gains they make in fluency (Samuels, 1997). This technique of repeated and monitored oral reading improves not only reading fluency, but also overall reading achievement (Armbruster & Osborn, 2001).
For decades researchers have investigated the effectiveness of repeated readings. Empirical findings indicate the approach to enhancing reading fluency was successful time and time again for students with reading delays. Dowhower (1987) found repeated reading resulted in improved reading rate, word recognition accuracy and comprehension of second grade transitional readers. Rasinski (2001) concluded repeated readings as an effective method for improving reading fluency and general proficiency of reading for third grade students of high, average, and low ability readers.

A recent investigation conducted by Joseph and Devault (2004) found repeated readings coupled with word boxes, a phonics technique designed to help children in making letter-sound correspondences (i.e. “cat” is made of individual sounds /c/ /a/ /t/) and identify letter-sound sequence patterns in words (i.e. “it” in words like “fit” and “sit”), produced an increase in reading fluency rates of high school students with specific learning disabilities in basic reading skills. The investigators indicated that the study lacked a control group and additional investigations including control conditions would further validate the findings. Repeated readings have also been found to increase comprehension rates in students diagnosed with a specific learning disability.

Investigators, Freeland, Skinner, Jackson, McDaniel, and Smith (2000) reported repeated readings as successful in improving children’s reading comprehension rates, in addition to fluency. For a comprehensive review of the effectiveness of repeated readings on building reading fluency, see Kuhn & Stahl (2003). Kuhn & Stahl (2003) provide the results of 15 studies that assessed the effects of repeated readings on fluency with control groups.
Word Boxes: The importance of word recognition in reading has been established throughout this paper. Here word boxes, a phonics technique, will be introduced as an empirically supported method for enhancing word identification skills. As cited in Joshi & Aaron (2002) "the ability to decode written words effortlessly is a necessary condition for successful reading performance" (p. 160). Poor phonological skills, or the inability to convert graphemes, the smallest part of written language (i.e. b, d, f, ch, or igh), into phonemes, the individual sounds in spoken language, automatically and accurately is a precursor to decoding difficulty (Maletasha et al., 2002; Joseph, Best Practice, p. 2). It is necessary for children learning to read to be able to recognize word patterns such as the rhymes and syllables that make up words (phonological awareness) as well as to have the ability to hear, identify, and manipulate the individual phonemes in spoken words (phonemic awareness) (Armbruster & Osborn, 2001). To become proficient readers, substantial evidence suggest that word boxes are effective in helping children with reading disabilities acquire phonemic awareness and word identification skills (Joseph, 1998/1999, 2000a, 2000b, 2002a, 2002b; Joseph & Devault, 2004; & Joseph & Seery, 2004).

Word boxes have been used as one type of phonics technique in an early literacy and prevention program, Reading Recovery, developed by Marie Clay in 1979 (Joseph, 2004) aimed at reducing the number of students who have severe difficulty developing early reading skills (D’Agostino & Murphy, 2004). Since the introduction of the Reading Recovery Program to the United States in 1984, more than one million students have participated in the program (D’Agostino & Murphy).
Word boxes “incorporate spelling and phonemic awareness training through the use of concrete manipulative materials” (Joseph, 2002). As an instructional technique it consists of a drawn rectangle divided into boxes or sections (typically drawn on a dry erase board) corresponding to the number of sounds in a word (i.e. three sections for “dog” /d/ /o/ /g/). Magnetic, foam, or plastic letters are placed below the divided sections. The instructor demonstrates a process referred to as phoneme segmentation using the word box method. Phoneme segmentation is breaking a word into its separate sounds while saying each phoneme in temporal order (Armbruster & Osborn, 2001). For example, with the word “dog” the instructor slides the letter “d” up into the first section of the rectangle while saying the letter sound /d/, each letter of the word is pushed up into its respective box as the sounds of the word are verbalized in sequential order (i.e. next /o/ then /g/ for “dog”). After the phonemes of the word are segmented, the instructor demonstrates phoneme blending, when a sequence of separately spoken phonemes are then combined to form a word (Armbruster & Osborn, 2001), by running an index finger under each letter saying the sounds in order a little faster this time, emphasizing each individual sound. Finally, the word is said as a whole blending all sounds as they are in a typical pronunciation of the word (i.e. “dog”). After the demonstration, the child repeats the process using the word box technique to segment and then blend the sounds of a word. The word box technique teaches children through modeling and practice to separate a word into its individual sound units and to combine the sounds to form a word. This lengthy description may give the impression that word boxes are cumbersome, albeit it commonly takes only a very short amount of time (one-minute or so) to demonstrate and have the child repeat the process for each word. This process can of course become more
time consuming as the number of words instructed on increases. Word boxes have been empirically supported as an effective instructional technique for improving word recognition (Joseph, 1998, 1999, 2000a, 2000b, 2002). As a result when, paired with repeated readings, word boxes help children increase accuracy as well as fluency while reading (Joseph & Devault, 2004).

Repeated Readings and Three Types of Corrective Feedback

The success of repeated readings has been demonstrated as an efficacious method for helping children to improve reading fluency. In addition, word boxes have been supported as a beneficial method of improving word identification skills and phonemic awareness. Research also suggests that improving children’s word identification skills leads to improved fluency and comprehension rates. In the present study, we consider the importance of instructional procedures designed to increase word recognition along with repeated readings for building fluency levels. There are very few investigations to date, examining differences between types of corrective feedback during oral reading instruction for children with delays in basic reading skills such as word recognition and reading fluency. In the present study, repeated readings will be used as an instructional technique to help students improve reading fluency, as well as word identification skills. In addition, three different types of corrective feedback for miscues will be provided to students in an effort to determine which is most effective for helping children read words in a passage accurately and fluently. The three types of corrective feedback include: word boxes, traditional drill, and interspersal of unknown to known words. Each is described below.
**Word Boxes** Word boxes have previously been described in detail as a phonics technique for aiding children with reading problems with the acquisition of phonemic awareness and word identification skills. Albeit, there has been little research on the utility of word boxes compared to other corrective feedback methods for improving reading fluency when combined with repeated readings. Word boxes might be referred to as one of the more contemporary phonics techniques. Word boxes are considered a contemporary approach to phonics instruction because of the emphasis on "word study, spelling, (i.e. units of written language or graphemes), and critical components of emergent literacy, such as phonological awareness" (as cited in Joseph & McCochran, date) Although research conducted by Joseph and Devault, 2004 established the utility of word boxes when paired with repeated readings, further investigation is needed to support findings that these instructional approaches, when combined, enhance reading performance, specifically in the area of reading fluency.

**Interperssal of Unknown to Known Words.** Interspersal training has been commonly thought of as alternating different academic assignments (i.e. worksheets, drill practice, and procedures), by interspersing mastered or known tasks with tasks in which students are learning (unknown) (Cates, Skinner, Watson, Meadows, Weaver, & Jackson, 2003). Neef, Iwata, and Page (1977) were among the first to study the effects of the interspersal method by teaching a list of 50% known to 50% unknown spelling and sight words to students with cognitive impairments (as cited in MacQuarrie-Klender, 2002; Tucker, Burns, & Harman, 2002). Findings indicated the method facilitated the acquisition and retention of unknown words more effectively than the traditional practice of presenting all unknown words. One such study conducted by Cooke and Reichard (1996),
investigated the effects of three interspersal drill and practice ratios (three different ratios of known to unknown math facts) on the acquisition and generalization of mathematical facts. Results showed that student participants improved the acquisition of math facts in all three interspersal drill ratios (Cooke & Reichard, 1996).

A second study implemented by Cooke, Guzuakas, Pressley, & Kerr (1993), looked at the efficacy of the interspersal procedure on spelling, math, and reading fluency gains of students with severe developmental delays and learning disabilities in three different experiments. The investigators used an interspersal ratio of 30% unknown/new items to 70% known/review items compared with 100% unknown condition (considered traditional practice). Results for each of the three experiments (spelling, math, and reading fluency) varied and were somewhat elusive. Although the interspersal technique was found as the best procedure with math fluency only, results indicate that children’s fluency improved as a result of the interspersal procedure in all three conditions. The overall gains in performance support the utility of interspersal procedures for instructional purposes. There is considerable research indicating the interspersal of unknown to known items improves the number of items students learn (Cuvo, Davis, & Gluck, 1991; Dunlap, 1984; Dunlap & Koegel, 1980; Neef, Iwata, & Page, 1980). Additional research on the effectiveness of interspersal training is needed. Little research has been conducted on interspersal training with oral reading instruction, particularly on the effectiveness of this method as a corrective feedback approach for improving word identification skills and fluent reading in conjunction with repeated reading.

It has been somewhat difficult for researchers to determine the most helpful ratio of known to unknown items to use in an interspersal drill. Except for the consistent
superiority of the interspersal procedure over repetition with other approaches, such as
the traditional drill, results have been inconsistent in determining which ratio of unknown
to known items is most efficacious (MacQuarrie et al., 2002). Conclusions between and
within studies are at times varied and inconclusive (Cooke et al., 2003; Cooke &
Reichard, 1996). A determining factor is whether the primary goal is for children to
increase learning most effectively (i.e. greatest retention) or to provide the greatest
opportunities for learning (Cates et al, 2003). It appears, that removing unknown items
and replacing them with known items improves learning (i.e. it is effective) because
children learn the few unknown words faster when less of them are provided with a high
ratio of known words. Cates et al. (2003) contend that a higher ratio of unknown words is
more efficient (but does not necessarily produce the most learning overall) giving
students more opportunities to learn unknown words that are presented with greater
frequency.

The current study uses an incremental rehearsal approach to interspersing unknown to
known material due to the apparent benefits of the approach for greater retention.
MacQuarrie et al. (2002) found that with the Incremental Rehearsal (IR) technique
student’s retention was significantly higher. Overall, students retained substantially more
words with this approach compared to Drill Sandwich (DS). Coulter and Coulter’s (1989)
DS model is based on a ratio of 30% unknown to 70% known words, in which unknown
items are interspersed with known items and the entire set of words is rehearsed three
times (as cited in MacQuarrie et al., 2002). The primary advantage, of the IR technique is
that it allows the learner greater opportunities for exposure to unknown words increasing
the likelihood of retention and generalization of learning (MacQuarrie et al., 2002). The
current study used an incremental rehearsal technique of one unknown word to every six known words, meaning that students were able to practice the unknown words a total of six times, which, or course, is twice the number of opportunities provided in the DS interspersal method. Further research is needed to establish to utility of the incremental rehearsal technique of interspersing unknown to known words as an effective model for promoting retention practiced items.

**Traditional Drill.** In addition, to the phonics technique of word boxes and the interspersal of known to unknown words, a traditional drill is considered here as a method of sight word instruction. Although there is a great deal of research on traditional instruction with sight words (see Browder & Xin, 1998 for a review), no such research has been found on traditional procedures as corrective feedback for miscues during repeated readings. In the present study, the traditional feedback method allows the student to review words read inaccurately during a one-minute oral reading. It is a flashcard method of presenting the student with each miscue one at a time. The instructor presents each word (miscue) to the student in a drill fashion, one after the other. Feedback is provided as needed. For instance, if the child does not recognize a word on an index card, the instructor verbally provides the word and asks the student to repeat it.

The traditional drill approach is a familiar practice in schools. Children may use this flashcard method to learn new material such as spelling words and multiplication facts.

The traditional drill approach and the interspersal technique are whole word methods of instruction (Joseph & McCachran, 2003), as opposed to a contemporary phonics approach like word boxes, in which a word is broken into individual sounds called phonemes (i.e. phoneme segmentation). The whole word or sight word approach provides
the learner with the entire word during instruction. Considerably more studies have been
done on the effectiveness of whole word instruction with children with disabilities than
those investigating the effects of phonics instruction (Joseph & McCachran, 2003). A
review of sight word instruction studies, performed by Browder and Xin (1998) found
some 48 separate studies since 1980. The review was aimed at demonstrating the
effectiveness of sight word instruction on children with disabilities, such as moderate to
severe developmental delays, emotional disturbance, and learning disabilities. Results
indicate that sight word instruction has been very effective in producing rapid skill
acquisition of children with disabilities (Browder & Xin, 1998).

Browder and Xin (1998) believe there is noteworthy shortcoming of most whole word
methods of literacy instruction, that is, “sight word research may provide strong
demonstrations of teaching students to name words, but falls short of demonstrating that
students understand these words” (p. 130). In fact, a primary challenge for students in
many sight word instruction studies was, when attempting to master words,
discriminating between words based on the letters and configuration of the word
(Browder & Xin, 1998). When students rely only on the visual cues provided in a word,
they can become easily confused mainly because many words look alike. For example,
the word “exit” (the way out, leave) could be misunderstood for the word “excite” (to
stimulate or energize) due to the similar appearance of the two words. Browder & Xin,
(1998), went on to explain that often students who are learning sight words when learning
to read, have no other reading skills. For instance, students might lack phonetic analysis
skills that allow them to separate letter sounds in order to discriminate between words
(Browder & Xin, 1998). Children then, memorize a word by sight, and are able to
recognize the same word in a different context, albeit they have not learned strategies for decoding words using this whole word method as they would with a phonics approach to instruction.

The present study is partially aimed at expanding upon research on the effectiveness of a contemporary phonics approach to literacy instruction compared to that of whole word instruction. In this study word boxes are the phonics corrective feedback approach and interspersal of unknown to known and traditional feedback are whole word or sight word methods. This particular study investigates which will be the more effective type of corrective feedback approach, when paired with repeated readings, for improving the reading fluency of children with developmental delays in reading.

**Immediate versus Delayed Feedback**

Corrective feedback can be delivered for miscues during oral reading in different manners. Feedback can be terminal (telling the word) in terms of its type and immediate (feedback directly after reading miscue) relevant to its timing (Hoffman & Isaac, 2001). Conversely, corrections are considered sustained feedback when they are designed to help the reader identify the word by drawing the student’s attention to the contextual cues or on the letter-sound features of words (Hoffman & Isaacs, 2001). Feedback can also be delayed. In contrast to immediate, delayed feedback provides the student with an opportunity to self-correct (Hoffman & Isaacs, 2001) because the instructor waits and does not immediately correct the student’s error. Oral reading instruction can also be characterized in terms of specific or generic instructional strategies. Specific methods provide the student with a particular feedback technique (i.e. word boxes, interspersal of unknown to known words and traditional drill) emphasizing specific instructions and
routine in a method of implementation (i.e. adherence to predetermined treatment procedures or steps), where as generic strategies may vary in procedure and specificity (Allinder, Dunse, Brunken, & Obermiller-Krolakowski, 2001). A generic method of feedback might be to simply provide the student the word after an error is made. With generic feedback the student is provided the whole word during oral reading instruction. The current study utilized a delayed, specific, and sustained approach to providing feedback. That is, the investigator waited until after the repeated reading (allowing students the opportunity to self-correct) to provide one of the three specific types of corrective feedback for errors, as well as drawing the student’s attention to the letter-sound features (i.e. word boxes).

Research suggests terminal, immediate, and generic strategies can inhibit the development of reading fluency in low ability readers. Hoffman and Isaac (2001) proposed a negative relationship between the use of terminal (telling the word) feedback by teachers and achievement gains of students. Researchers called this a “if you hesitate then I’ll tell you the word “(Hoffman & Isaac, p. 187) pattern of interaction between teacher and below grade level readers. This interaction pattern essentially prevents the reader from developing independence during reading, as well as to rely on his or her instructor for immediate feedback (Hoffman & Isaac, 2001). Allinder et al. (2001) found students who had used a specific oral reading fluency strategy performed significantly better on a reading fluency posttest than did students who provided the generic strategy. The current study is interested in seeing whether or not children demonstrate gains in reading fluency and word recognition with the three methods of corrective feedback for
errors from pretest to posttest, further corroborating empirical evidence that delayed, specific and sustained approaches to feedback determine greater acquisition of learning during oral reading instruction.

**Instructional Effectiveness versus Efficiency**

Student learning is affected by efficient instruction that maximizes the number of learning opportunities and minimizes the amount of time involved in those learning opportunities (Cates et al., 2003). Instructional methods and interventions that are less time consuming allow the learner more occasions for learning to occur. For this reason, the efficiency of varying types of reading instruction should be considered in addition to the overall effectiveness of an approach.

Instructional efficiency is a measure of learning rate, or the number of words mastered per instructional minute (Skinner, Belfiore, & Watson, 1995, as cited in Cates et al., 2003). An instructional method that is very efficient provides the learner with the maximum amount of learning trials during instruction. If two interventions are compared for instructional efficiency the one that is more efficient would be that in which students learn the most amount of material in the shortest amount of time. For example, if a teacher plans a hour lecture on American history and she spends one half of the hour reviewing the previous days material, and the other half of the hour talking to the class about new material she is probably not instructing with optimal efficiency. A more efficient instructional approach would allow for a maximum amount of time for students to be actively involved in learning (i.e. group work, debate, or student led discussion). This is a hypothetical scenario, albeit researchers have provided empirical support for considering instructional efficiency in schools.
As Skinner et al. (1995) demonstrated not all interventions are equally efficient or result in the same amount of learning in equal amounts of instructional time (Cates et al., 2003). Skinner showed that learning rate is important to instruction with the findings of his 1995 study on learning efficiency. In this study, two interventions were compared to see which produced the greatest amount of learning new words. In the first, slow taped words intervention, words were presented every 5 seconds. In the second intervention with fast taped words, words were provided one after the other. Results indicated that the rapid taped words intervention was most efficient; students learned the most words in the least amount of time. Although the slow word intervention indicated greater effectiveness, where students learned more words overall, when considering learning rate (i.e. the number of words learned per instructional minute), the fast taped words intervention was clearly better.

In 1997, Watson and Ray replicated the Skinner et al. (1995) investigation and found the same results. The replication study, evaluated the effectiveness of two different approaches to instructing children with learning disabilities on sight word vocabulary acquisition. Again, when looking at the learning rate of students, the immediate presentation of words resulted in a quicker learning rate than did the presentation of a word every five seconds. That is, the rapid presentation condition resulted in the greatest amount of learning efficiency for children in this study.

Skinner, Belfiore, Mace, Williams-Watson, and Johns (1997), demonstrated the effects of learning rate in mathematics. Results indicate that verbal responding resulted in a larger number of trials and greater increases in learning rates, than did written responses. When students were asked to write responses to multiplication questions it
took more time than when students responded verbally. Therefore, students in this study were given more opportunities to respond to the to-be-learned material when the more timely approach of responding verbally was used.

Research has indicated that, “enhancing learning rate of those who have already fallen behind their peers is the only way to fully remediate student skill deficits” (Cates et al., 2003, p. 601). Further according Cates et al. (2003), empirical evidence suggests, “increasing the number of opportunities students have to respond enhances academic skill” (p. 602). The goal of helping any child with academic deficiencies is to improve their skills to the level equal to that of peers. Cates et al. (2003), believes that looking at the efficiency of an instructional approach or academic intervention, gives students the opportunity to make greater gains in a shorter amount of time, increasing student’s chances of developing the skills needed to keep up with peers academically.

A recent study conducted by Cates et al. (2003) further demonstrated the importance of considering efficiency. Researchers were interested in the affects of three different experimental conditions, interspersal training (IST), high-p sequencing (HPS) and traditional drill and practice (TDP), on a measure of instructional effectiveness and a measure of instructional efficiency (i.e. learning rate) on the acquisition of spelling words with students with spelling difficulties. Instructional effectiveness was the overall number of words learned by students in the three conditions and instructional efficiency was determined by calculating the learning rate of each child to determine the number of words mastered per minute of instruction. All three conditions started with 6 target unknown spelling words to-be-learned. For the IST condition three known words were added to the 6 target words, with one known word interspersed after every third target
word for total of 9 words presented in this condition. The HPS condition consisted of the 6 target words presented with 3 known words given before each target word. Children were exposed to 18 words in the HPS condition; notice there were 9 additional known words presented in the HPS condition than in IST. The TDP condition included only the 6 target to-be-learned words. Findings indicated, “that when instructional time is factored into the analysis, there appears to be a considerable advantage in understanding the functional relationship between instructional conditions and student performance” (Cates et al., 2003, p. 609).

Results of the Cates et al. (2003) investigation were very intriguing when considering differences between the overall effectiveness compared to the efficiency of each of the three spelling interventions. Findings regarding the effectiveness showed that the cumulative number of words mastered across all three conditions to be similar. Students in all three conditions learned approximately the same number of words (approximately 13 total words) by the final session. If educators primary goal is to maximize spelling acquisition any of the three methods described in this study would work. However when considering efficiency, graphical representations of the data across the three interventions, illustrated clear variability in learning rate, with the TDP producing the greatest amount of words learned in each minute of instructional time. Cates et al. (2003) ascertains that research on instructional efficiency suggests that basing decisions on the effectiveness of an intervention or instructional methods could be considered poor educational practice that ignores student-learning rates; failing to maximize students’ learning potential. Furthermore, because teacher are required to organize there time by
the most efficient means possible, when given a choice between different interventions teachers would likely use the intervention that produces the best result in the least amount of instructional time (Witt, Elliot, & Martens, 1984).

More research is needed to determine the differential instructional efficiency of specific types of reading instructions. In the area of fluency instruction, an investigation of learning rate would be particularly helpful in determining which type of corrective feedback, phonic analysis (i.e. word boxes), interspersal of unknown to known, or traditional drill with practice, produces the greatest increases in reading fluency in the shortest amount of instructional time. According to Cates et al. (2003) learning efficiency is especially pertinent given the allotted amount of instructional time available within any given school day. Educators and students alike would certainly benefit from understanding which approach to correct feedback for miscues during repeated readings helps students learn the most in the least amount of time. For this reason, the present study considers instructional efficiency in addition to the overall effectiveness of each of the three feedback methods presented to student participants with reading difficulties.

Problem Statement

Research is limited regarding the effectiveness of types of corrective feedback during repeated reading instruction for children with deficits in reading. Additionally, there is a need for research comparing the phonic analysis to whole word corrective feedback methods. The present study is interested in investigating which type, phonic analysis or whole word, corrective feedback during fluency training allow students the greatest cumulative gains in word recognition and reading fluency; a measure of effectiveness. Furthermore, this study serves as an examination of differentiation of instruction
efficiency or learning rate. Cates et al. (2003) and other expert researchers have
determined the importance of considering efficient instruction, albeit there has not yet
been a study investigating efficiency in reading fluency instruction. The present study
will measure the instructional efficiency of each of the three feedback conditions to
determine which if any produces the greatest amount of increases in reading fluency and
word identification per instructional minute. The information gained regarding student
learning rates will help teachers determine which instructional feedback approach is best
suited for the classroom.

Purpose of Study

The main objective of this investigation is to determine which type of word
recognition corrective feedback is most effective and which is most efficient, when
combined with repeated readings, for helping children with reading disabilities read
words in a passage fluently and accurately. The findings of this study can be used to help
special educators as well as regular educators understand which methods of corrective
feedback will help student achieve the most effective gains in oral reading fluency
instruction, particularly during repeated readings. Educators will also have information
regarding the most time efficient plan to use in the classroom when considering potential
relative to learning rate.

Research Questions

The present study will explore the following specific research questions:

1) Which type of corrective feedback method, word boxes (phonic analysis),
   interspersal unknown to known, or traditional whole word, is most effective for
   helping children read words in a passage fluently (accurately and quickly)?
2) Which type of corrective feedback method, word boxes, interspersal unknown to known, or traditional whole word, is most efficient (as measured by how many words are read fluently per minute for each instructional condition) for helping children read words in a passage fluently?

3) Which type of corrective feedback method, word boxes, interspersal unknown to known, or traditional whole word, is most effective for increasing children's word recognition (i.e. accuracy) during repeated readings?

4) Which type of corrective feedback method, word boxes, interspersal unknown to known, or traditional whole word, is most efficient for increasing children’s word recognition skills (i.e. accuracy) during repeated readings?
CHAPTER 2

METHODOLOGY

This chapter provides a description of the methods used to address the research questions previously proposed in this study. In particular, the following are described in detail, the participants, setting, investigator, independent observers, dependent variable, screening, baseline or pretest, progress monitoring and posttest, assessment probes, experimental design and procedures, instructional conditions, and treatment integrity and interobserver agreement.

Participants

Participants included nine third grade students, two girls and seven boys, who were referred by special education or general education teachers for participation in the current study. Teachers identified participants as reading below grade level and in need of additional instruction in reading to improve fluency and word identification skills. The Dynamic Indicators of Basic Literacy Skills, 6th Edition (DIBELS) were used as a screener to identify participants as at risk for problems in reading and in need additional intervention services (see Screening, Progress Monitoring and Post-Assessment below). Student participants ranged in age from 9 to 10, with a mean age of 9.4 years. Seven students were enrolled in the general education curriculum and two students received
special education services at school. One student had a specific learning disability, three were diagnosed with conduct disorder and in resource room for reading, and five students in general education were in a below grade level reading group in class and identified (by teachers and the DIBELS screener) as reading below age and grade level. The socioeconomic status of the students was in the low to middle class range, with seven students on the free and reduced lunch plan at school (two students were not receiving free and reduced lunch). Students in special education were identified by the Ohio Department of Education criteria for the identification of individuals with special education needs.

Individual student information is provided here. Jeremy was a regular (general) education student, in a below age and grade level reading group, and received free and reduced lunch at school. Anna, a student in special education was diagnosed with conduct disorder, received resource room services in reading, and free and reduced lunch. Brett was a regular education student, reading below age and grade level, and was not in need of free and reduced lunch at school. Danielle (Danny), a regular education student, was in a reading group below age and grade level, and received free and reduced lunch. Robert, a regular education student was diagnosed with conduct disorder, read below age and grade level, and received free and reduced lunch. Mathew was in regular education, in a reading group below age and grade level, and did not receive free and reduced lunch. Samuel (Sam), a regular education student was diagnosed with conduct disorder, in a reading group below age and grade level, and received free and reduced lunch at school. Alan received special education services for a specific learning disability (SLD) in
reading. He attended resource room for reading and was on the free and reduced lunch plan at school. Ricky, a regular education student, read below age and grade level, and received free and reduced lunch.

Parent permission was obtained for all participants taking part in the study. In order to obtain parent permission, students were given permission forms at school to be taken home and signed. An addressed and stamped envelope was provided with the permission forms, giving parents an option of mailing the permission form or sending it back to school with their child. The experimenter ensured that parent permission was obtained for all participants prior to implementation of the procedures of this study.

Setting

The investigation was carried out in an elementary school in central Ohio. The school district serves children from low to middle socioeconomic status, with 43% of students on free and reduced lunch. The state average is 36%. Children in grades kindergarten through third attend the elementary school.

Within the school, the investigation was conducted in a little room off of the library that is typically used for independent or small group instruction. The room is quiet and free from potential distracters such a background noise and conversation typically occurring in a normal large group classroom setting. The room was small and contained only one large rectangular table with two chairs. The experimenter sat on a diagonal from students during instructional sessions, in an effort to allow the student and the investigator easy maneuverability and a clear view of instructional materials. The experimenter worked with each participant independently.
The Investigator

The investigator was a second year graduate student in the school psychology graduate program at The Ohio State University. She was trained in the systematic administration of the three instructional corrective feedback methods used in the study, as well as the implementation of repeated oral readings of connected text. In addition to training specific to this study, the investigator has taken courses in reading instruction at The Ohio State University including, remedial and clinical reading instruction and linking academic assessment to intervention.

Independent Observer

The interobserver was also a second year school psychology graduate student at The Ohio State University. The observer was instructed on the correct systematic procedures for independent observation of the instructional conditions. Independent observations were carried out for 20% of the instructional sessions. In order to ensure treatment integrity of this experiment, the independent observer verified the each step of the intervention was carried out as indicated by the treatment integrity checklist and intervention script.

Screening, Progress Monitoring, and Post-Assessment

The Dynamic Indicators of Basic Literacy Skills, 6th Edition (DIBELS) was used as a screener to measure reading fluency levels for pre-assessment, as well as for progress monitoring and post-assessment. DIBELS are a set of standardized, individually administered measures of early literacy instruction. DIBELS are designed to be short (one minute) fluency measures used to monitor the development of pre-reading and early reading skills (DIBELS data system). For this investigation the DIBELS Oral Reading
Fluency (DORF) measure was used as a standardized measure of accuracy and fluency with connected text. DORF is designed to identify children who may need additional instructional support, and monitor progress of instructional goals. Student performance is measured by having the students read a passage out loud for one minute. The administrator records the number of errors the student makes in the one-minute oral reading. The following are scored as errors or miscues in reading: words omitted, substituted, and hesitations for more than three seconds. Words self-corrected within three seconds are scored as correct. The number of correct words (i.e. calculated by subtracting the total errors from the total words read) read in the one-minute reading is the student’s oral reading fluency score for that passage.

DORF provided a pre-assessment, progress monitoring, and post-assessment measure of participant’s accuracy and fluency of connected text and compared participant performance with that of the standardized sample of children in the same grade. Students’ obtained reading fluency scores were recorded, and used to identify the student’s “Descriptive Level of Performance” in third grade. Participant’s pre-assessment performance levels ranged from “At Risk” (Intensive - Needs Substantial Intervention) to “Some Risk” (Strategic - Additional Intervention Recommended), supporting the need for additional oral reading fluency instruction provided in the current study.

Dependent Variables

The dependent variables for this study included: reading fluency and word identification. Reading fluency performance was a measure the number of words read correctly in a one-minute oral passage reading. Word identification (or word recognition) was measure a of the number of words learned or read correctly in an oral reading
subsequent to corrective feedback provided for errors in reading. Errors were counted if a
student omitted, mispronounced, skipped, made no attempt or substituted a word during
oral reading. Errors that were self-corrected were counted as accurate. Immediate
feedback was not provided during oral reading, rather specific and delayed feedback was
provided in the form of one of the three instructional corrective feedback approaches
after the completion of a one-minute oral reading of connected text. A word was counted
as correct if it was not an error. In other words, a word was correct simply if the student
read the word accurately during the 60 second oral reading. For example, if the word
“encourage” was presented in the passage and the student read the word “encourage”
accurately, during the one-minute time limit, the student received credit for this word. If
a student struggled on a word (i.e. sounded the word out, attempted the word multiple
times) at first, but verbalized the correct word in the final attempt (i.e. self-corrected) of
the word, the student received credit because the final pronunciation was accurate. The
instructor did not provide prompting or assistance to the student at any time during the
reading. If the student asked for assistance the standardized response was, “just try your
best”.

Assessment Probes

Repeateated readings of instructional level passages were used as assessment probes to
measure changes in student performance (oral reading fluency) throughout the
investigation. Instructional level passages were Standard Oral Reading Fluency
Assessment Passages (RAPS ) obtained from the AIMSweb System Reading Curriculum-
Based Measurement (R-CBM) (Howe & Shinn, 2002). The oral repeated readings
allowed the investigator to document the number of words read as well as the number of
words learned for each session. After the initial reading of a passage for the current
session or the repeated reading of a passage from the previous session, participants
received one of the three corrective feedback approaches, for words read incorrectly, and
immediately thereafter performed a repeated oral passage reading for one-minute. The
investigator would record the number of words read correctly and the number of words
learned, as well as the amount of instructional time (in seconds) for each session. A
session consisted of an initial reading, corrective feedback, and a repeated reading, or if
an initial reading had already taken place, corrective feedback and a repeated reading.

Instructional Conditions and Procedures

The present study was part of a larger grant project conducted by an associate
professor of school psychology at The Ohio State University. Students (a total of nine)
were chosen randomly to participate in this smaller study, from a pool of 60 students
participating in the larger project. The procedures for implementation were identical for
both this study and the larger investigation. Students were then randomly assigned to one
of the three instructional conditions, with three students assigned to each condition. The
three instructional conditions included in this study were, repeated readings with phonic
analysis corrective feedback, repeated readings with interspersal of unknown to known
word recognition corrective feedback, and traditional whole word corrective feedback.
Students participated in one of three instructional conditions for 2 sessions per week for a
total of 20 sessions. Each instructional corrective feedback condition was timed to
calculate the amount of time needed to implement a method of corrective feedback
during each session. This information was used to calculate group learning rate, a measure of instructional efficiency. What follows, is a description of the three different instructional conditions respectively.

Repeated Readings with Phonetic Analysis

In this condition, students were asked to read an instructional level passage orally. The student was given scripted directions before the passage was presented for a one-minute oral reading (See Appendix A). Directions were as follows, “Start her (investigator points to starting point in the text) and read aloud as quickly as you can. If you come to a word you do not know just try your best. You will have one-minute to read. I will tell you when to stop. Are you ready? Okay, begin”. After the one-minute oral reading was completed, the investigator recorded the total number of words read correctly. Total words read correctly were obtained by taking the total number of words read and subtracting those read incorrectly. This was the student's oral reading fluency score for the reading. For example, if the student read 70 words per minute with 5 miscues (or words read incorrectly), the reading fluency score of 65 was calculated by subtracting 5 from 70. The investigator also recorded the words read incorrectly. These were the miscues or errors the investigator instructed on during the corrective feedback portion of the instructional condition.

The phonetic analysis corrective feedback was provided using a word box approach. Word boxes teach children to make one to one correspondences between the letters and sounds in words (Clay, 1993, as cited in Joseph, 2004). Children are taught to match and associate the written letters to the corresponding spoken sounds in words. The materials needed for the administration of the word box method of phonetic analysis corrective
feedback included: a dry erase board and dry erase marker, index cards, and foam or plastic letters. To administer the words boxes for the student's miscues during the oral reading the investigator first wrote each miscue on an index card. Then, a rectangle was drawn on the dry erase board with the marker, including lines drawn to divide the rectangle into sections (connected boxes) according to the number of sounds heard in the target word (the first miscue). The dry erase board was moved directly in front of the student. Next, an error (word read incorrectly during oral reading) was written on an index card placed above the rectangle. The plastic or foam letters were positioned below the divided sections of the rectangle, with each letter or combination of letters under the box that represents the corresponding sound heard in the target word. The investigator demonstrated the process for the student. The investigator slid each letter or letter group up into its corresponding box and pronounced each sound of the word. The sounds in the word were emphasized by stretching the pronunciation of the word (segmenting the sounds in the word). The investigator said the word again slowly while running a finger under each sound of the word as it is emphasized. After the demonstration, the letters were pulled beneath the rectangle once again, and the student practiced the word box procedure for the target word.

Here is an example of the administration of the word box approach. Let us say that the word "bat" was read incorrectly in the passage. The word "bat" would be printed on an index card and placed above a drawn rectangle, divided into three sections according to the number of sounds heard in the word. The letters "b" "a" "t" would be positioned below the three sections of the rectangle. If it was the child's turn, he/she would slide the "b" up into the first section, while saying the /b/ sound, then the "a" would be pushed up
into the second box with the /a/ sound accompanying, and finally the "t" would be pushed into the last box as the child pronounced the /t/ sound. The child would then slide an index finger under each letter while saying the entire word once more, slowly stretching the word to hear the sound in the word.

After word boxes were presented for each miscue during the initial oral reading, the child read the passage again (for one minute) and the investigator recorded the number of words learned (miscues read correctly during the repeated reading) and the reading fluency score. The entire procedure was repeated until at least 90 words were read correctly in two consecutive readings of the passage. This was the criterion for students to move to the next instructional level passage. The initial oral reading, corrective feedback for miscues, and subsequent repeated readings (with corrective feedback provided for miscues after each reading of connected text) continued for a total of 20 instructional sessions. Note, if a child did not have any errors while reading, a repeated reading followed immediately (this rule applied to all three instructional conditions).

Repeated Readings with Incremental Rehearsal Corrective Feedback

In this condition, students were asked to read an instructional level passage orally. Students were given scripted directions before the passage was presented for a one-minute oral reading (see Appendix B). After the one-minute oral reading, the investigator recorded the total number of words read correctly. This was the student's oral reading fluency score for the reading. The investigator also recorded the errors during reading. These words are the miscues the investigator instructed on during the corrective feedback stage of the instructional condition.
Upon the completion of the one-minute timing of the passage, the words read incorrectly (errors) were taught in isolation through an interspersal whole-word recognition procedure. Six high frequency words (known words) read correctly during the oral reading were selected and placed on index cards. Words read incorrectly or errors during reading (unknown words) were also placed on index cards. The unknown words were interspersed with known words using the incremental rehearsal technique described in chapter 1.

The following is a description the interspersal procedure as it was carried out during an instructional session. To begin, present an unknown word and then present the first known word, present an the unknown word again, present the first known word, the second known word, and present the unknown word, present the first known word, second known word, third known word, and so on until all six known words have been presented. At the end of the cycle, the first unknown word becomes a known word (a learned word), and it replaces the first known word in the series (first known word removed). The next unknown word is presented and the series is continued until all six known words have been interspersed (using the incremental rehearsal method) with the unknown word. The entire procedure continues until all unknown words have been replaced as known words in the drill. At the end of this drill, the student was asked to read the passage again and the procedure continued until criterion levels of reading fluency performance were achieved.

Repeated Reading with Traditional Whole Word Recognition Corrective Feedback

In this condition, students were asked to read an instructional level passage orally. Students were given scripted directions before the passage was presented for a one-
minute oral reading (See Appendix C). After the one-minute oral reading the investigator recorded the total number of words read correctly. This was the student’s oral reading fluency score for the reading. The investigator also recorded the words read incorrectly. These words are the miscues the investigator used for instruction during corrective feedback.

Upon the completion of the one-minute timing of the passage, the words read incorrectly were taught in isolation through a traditional whole-word recognition drill procedure. To start, the miscues were printed on index cards. Each word was presented to the student, as the investigator said the word aloud. The student took a turn, by repeating the target word aloud. If the student made a mistake in the pronunciation, the investigator provided immediate feedback (i.e. “the word is exceptional”). After all words read incorrectly were presented in the traditional drill, with accurate pronunciation of each word, the student read the passage again (repeated reading) and the process was repeated until criterion levels of performance were reached (90% oral reading accuracy on two consecutive passages).

Experimental Design

The experimental design used in the current study was variation of a timed series design, in which baseline data (pre-assessment with DIBELS) were collected prior to session one, instructional procedures were implemented (sessions one through 10), progress monitoring was collected (after session 10 using DIBELS), instructional procedures continued (sessions 11 through 20), and post-assessment data were collected upon completion of instructional session 20. All students received 20 sessions of instruction, except Ricky who completed 18 sessions before moving out of the district.
Individual and group data for Ricky includes reading fluency (word read) and word identification (words learned) scores for sessions 1 through 18. Ricky was part of the phonic analysis corrective feedback condition.

Oral reading fluency scores or words read, for each of the three instructional conditions, (phonetic analysis corrective feedback, interspersal of unknown to known words corrective feedback, and traditional whole word corrective feedback) are provided in graphs (Figures 3.1 and 3.2) to illustrate an instructional group comparison of cumulative words read (instructional effectiveness) and cumulative learning rate of fluency (instructional efficiency). Word identification scores or words learned, for each of the three instructional conditions, are also presented in graphs (Figures 3.3 and 3.4) to provide a group comparison of cumulative words learned (instructional effectiveness) and learning rate of word identification (instructional efficiency). Means and ranges of words read and words learned by group (Tables 3.3 and 3.4) and by individual (Table 3.5 and 3.6) are provided in table format. Table 3.7 presents DIBELS assessment scores collected from pre-assessment, progress monitoring, and post-assessment for each individual participant.

Cumulative effectiveness was calculated for each instructional condition (i.e. word boxes, interspersal, and traditional) by first adding participants' (three participants in each condition) obtained reading fluency (words read) and word identification (words learned) scores respectively for session one, and then adding that figure to the group sum for session two, and adding the product to the group total for session three and so on for all 20 instructional sessions. In order to obtain measures of efficiency (learning rate), for each instructional group the number of words read and words learned for each session
was multiplied by 60 seconds and then divided by the total amount of instructional time (in seconds) spent under each respective instructional feedback technique. This provided the number of words mastered (words read or words learned) per minute of instruction for each individual session (for sessions one through 20). To obtain a cumulative measure of efficiency, the number of words mastered per minute was added across sessions.

Treatment Integrity

To verify the systematic implementation of instructional procedures (treatment validity), a trained independent observer completed treatment integrity checklists for each of the three instructional conditions (see Appendices A - F). Treatment integrity checklists were completed for 20% of instructional sessions. The independent observer was provided with a checklist of each step or procedure implemented during instruction. Procedures involving proper use of materials, implementation of instructional approaches, and recording of data onto student data chart (i.e. words read correctly, words read incorrectly, new words, sentences with expression and total instructional time) were observed. During an observation of instructional procedures, the independent observer checked off each step of instruction as it was completed accurately. The check was completed by the observer circling “yes” if the procedure was carried out accurately and “no” if the procedure was carried out inaccurately. The observer also circled “no” if steps were not followed sequentially. For example, step one of the repeated readings and phonics analysis with word boxes is an initial reading if a novel passage. If the observer sees that the investigator presents the student with instructional level passage and provides scripted directions accurately, for the one-minute initial reading as described in
step one, the observer circles “yes”. This signifies all conditions for step one were met during the observation. The observer continues to evaluate the integrity of instruction by circling yes or no for each step described on the treatment integrity checklist.

Interobserver Agreement

Interobserver agreement is calculated by independent observers to determine the percentage of agreement with the experiment in recording oral reading fluency (number of words read correctly in one minute) and miscues for repeated readings (words read incorrectly, a measure of word recognition) Interobserver agreement is calculated by, dividing the total number of agreements by the total number of agreements plus disagreements and multiplying the sum by 100. Interobserver agreement in this study was at 100% agreement.

The formula for interobserver agreement is:

\[
\frac{\text{Number of Agreements}}{\text{Number of Agreements} + \text{Disagreements}} \times 100 = \% \text{ Agreement}
\]
CHAPTER 3

RESULTS

This chapter presents the results of the study according to the research questions posed in chapter 1. Here, the instructional effectiveness and efficiency of each of the approaches to corrective feedback (phonic analysis, interspersal of unknown to known words, and traditional whole word) is addressed. Results on the dependent variables of fluency and word identification are presented for each instructional corrective feedback condition. The three instructional conditions are compared to evaluate the overall effectiveness and efficiency of each approach in helping children to read words in connected text quickly and accurately (fluently) and recognize words for which feedback was provided. The means and ranges of words read (a measure of fluency) and words learned (a measure of word identification) are presented for each instructional condition or group and for each individual participant. Pre-assessment (baseline), progress monitoring, and post-assessment results measured by the Dynamic Indicators of Basic Literacy Skills, 6th Edition (DIBELS) are reported. Independent observer agreement calculations on the dependent variables and procedural integrity are also provided.
1) Which type of corrective feedback method, word boxes (phonic analysis), interspersal unknown to known, or traditional whole word, is most effective for helping children read words in a passage fluently (quickly and accurately)?

Instructional effectiveness is a measure of cumulative learning as a result of instruction. This study investigated which corrective feedback approach resulted in the most words read per one-minute repeated readings. Table 3.1 provides group means and ranges of words read during repeated readings, a measure of reading fluency, across each of the three instructional conditions. As reported in the methods section, chapter 2, nine participants were randomly assigned to one of three instructional feedback conditions, with three participants in each instructional group.

<table>
<thead>
<tr>
<th>Condition/Group</th>
<th>Group Mean</th>
<th>Group Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonic Analysis</td>
<td>259.4</td>
<td>172-324</td>
</tr>
<tr>
<td>Interspersal of Known to Unknown Words</td>
<td>282.5</td>
<td>254-324</td>
</tr>
<tr>
<td>Traditional Drill</td>
<td>283.3</td>
<td>241-330</td>
</tr>
</tbody>
</table>

Table 3.1 Means and Ranges of Words Read by Group

Words Read (Instructional Effectiveness) As illustrated in Table 3.1, the students receiving the phonic analysis (word box) corrective feedback obtained a group mean words read score of 259.4 (range = 172-324) words read per one-minute repeated
readings. In the interspersal unknown to known words instructional condition, students obtained a group mean score of 282.5 (range = 254-324) words read. Student's receiving the traditional drill (whole word) type of corrective feedback for miscues during repeated readings, obtained a group mean of 283.3 (range = 241-330) words read. Group mean scores indicate that students in the traditional condition obtained the greatest average words read by only a slight margin, although a graphical representation of the data indicate little variance between the traditional and interspersal conditions in cumulative words read (instructional effectiveness). See Figure 3.1 for an idiographic representation of cumulative words read for each group, a measure of instructional effectiveness across each instructional feedback condition.

2) Which type of corrective feedback method is most efficient (as measured by how many words are read fluently per minute for each instructional condition) for helping children read words in a passage fluently?

Instructional efficiency is a measure of learning rate, or the number of words mastered per instructional minute (Skinner, Belfiore, & Watson, 1995, as cited in Cates et al., 2003). Learning rates of reading fluency were calculated by multiplying the number of words read in a session by 60 seconds and then dividing by the total amount of instructional time in seconds. Table 3.2 provides group means and ranges of learning rates of reading fluency across each instructional condition.
<table>
<thead>
<tr>
<th>Condition/Group</th>
<th>Group Mean</th>
<th>Group Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonie Analysis</td>
<td>35.7</td>
<td>17.7-88.0</td>
</tr>
<tr>
<td>Interspersal of Known to Unknown Words</td>
<td>56.6</td>
<td>24.1-97.0</td>
</tr>
<tr>
<td>Traditional Drill</td>
<td>78.1</td>
<td>47.2-134.5</td>
</tr>
</tbody>
</table>

Table 3.2 Means and Ranges of Learning Rates of Reading Fluency by Group

Learning Rate of Reading Fluency (Instructional Efficiency) As illustrated in Table 3.2, the students receiving the phonie analysis (word box) corrective feedback obtained a group learning rate of reading fluency mean score of 35.7 (range = 17.7-88.0) words read per instructional minute (instructional time is the total time in seconds it takes to provide a student with corrective feedback). In the interspersal unknown to known words instructional condition, students obtained a group mean score of 56.6 (range = 24.1-97.0) words read per instructional minute. Student's receiving the traditional drill (whole word) type of corrective feedback, obtained a group mean of 78.1 (range = 47.2-134.5). Group scores indicate that the students in the traditional condition obtained the highest average learning rate of reading fluency. See Figure 3.2 for a graphical representation of cumulative learning rate of reading fluency, a measure of instructional efficiency, across each instructional feedback condition.
Figure 3.1 Cumulative Words Read (Instructional Effectiveness)

Figure 3.2 Cumulative Learning Rate of Reading Fluency (Efficiency)
3) Which type of corrective feedback method is most effective for increasing children's word identification (words learned) during repeated readings?

This study also investigated which corrective feedback approach resulted in the most words learned, a measure of word identification. Words learned are the miscues, in which children were provided corrective feedback and in which children identified (read) correctly in a repeated reading immediately following instruction. Table 3.3 provides group means and ranges of words learned across each of the three instructional conditions.

<table>
<thead>
<tr>
<th>Condition/Group</th>
<th>Group Mean</th>
<th>Group Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonic Analysis</td>
<td>4.4</td>
<td>1-10</td>
</tr>
<tr>
<td>Interspersal of Known to Unknown Words</td>
<td>3.4</td>
<td>0-8</td>
</tr>
<tr>
<td>Traditional Drill</td>
<td>4.7</td>
<td>1-12</td>
</tr>
</tbody>
</table>

Table 3.3 Means and Ranges of Words Learned by Group

**Words Learned (Instructional Effectiveness)** As illustrated in Table 3.3, the students in the phonic analysis (word box) instructional condition obtained a group mean score of 4.4 (range = 1-10) words learned with corrective feedback. In the interspersal unknown to known words instructional condition, students obtained a group mean score of 3.4 (range = 0-8) words learned. Student's receiving the traditional drill (whole word) type of
corrective feedback, obtained a group mean of 4.7 (range = 1-12). Group scores indicate that the students in the traditional condition obtained the highest average words learned, however a graphical representation of cumulative words learned (instructional effectiveness) illustrate scores are clustered, and similar between the traditional and phonic analysis groups. Refer to Figure 3.3 for an idiographic representation of cumulative words learned (instructional effectiveness) across each instruction feedback condition.

4) Which type of corrective feedback method is most efficient for increasing children's word identification skills (words learned) during repeated readings?

Learning rates of word identification were calculated by multiplying the number of words learned in a session by 60 seconds and then dividing by the total amount of instructional time in seconds. Table 3.4 provides group means and ranges of learning rates of word identification across each instructional condition.

**Learning Rate of Word Identification (Instructional Efficiency)** As illustrated in Table 3.4, the students receiving the phonic analysis (word box) corrective feedback obtained a group learning rate of word identification mean score of 0.51 (range = 0.22-0.87) words learned per instructional minute (instructional time is the total time in seconds it takes to provide a student with corrective feedback). In the interspersal unknown to known words
instructional condition, students obtained a group mean score of 0.62 (range = 0-2.4) words read per instructional minute. Students receiving the traditional drill (whole word) type of corrective feedback, obtained a group mean score of 1.3 (range = 0-5.45). Group scores indicate that the students in the traditional condition obtained the highest average learning rates of word identification. See Figure 3.4 for an idiographic representation of cumulative learning rate of word identification, a measure of instructional efficiency, across each instructional feedback condition.

<table>
<thead>
<tr>
<th>Condition/Group</th>
<th>Group Mean</th>
<th>Group Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonic Analysis</td>
<td>0.51</td>
<td>.22-.87</td>
</tr>
<tr>
<td>Interspersal of Known to Unknown Words</td>
<td>0.62</td>
<td>0-2.4</td>
</tr>
<tr>
<td>Traditional Drill</td>
<td>1.3</td>
<td>0-5.45</td>
</tr>
</tbody>
</table>

Table 3.4 Means and Ranges of Learning Rates of Word Identification by Group
Figure 3.3 Cumulative Words Learned (Instructional Effectiveness)

Figure 3.4 Cumulative Learning Rate of Word Identification (Efficiency)

51
Individual Results

Tables 3.5 and 3.6 provide the fluency and word identification data for each individual participant. Table 3.5 illustrates each participant’s mean and range of words read during repeated readings calculated from the 20 instructional sessions provided. Table 3.6 depicts each participant’s mean and range of words learned with corrective feedback for all sessions.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Condition</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alan</td>
<td>Phonic Analysis</td>
<td>83.3</td>
<td>53-101</td>
</tr>
<tr>
<td>Ricky</td>
<td>Phonic Analysis</td>
<td>88.2</td>
<td>76-146</td>
</tr>
<tr>
<td>Sam</td>
<td>Phonic Analysis</td>
<td>88</td>
<td>62-118</td>
</tr>
<tr>
<td>Mathew</td>
<td>Interspersal</td>
<td>90.3</td>
<td>65-110</td>
</tr>
<tr>
<td>Robert</td>
<td>Interspersal</td>
<td>103</td>
<td>84-118</td>
</tr>
<tr>
<td>Danny</td>
<td>Interspersal</td>
<td>89.6</td>
<td>72-107</td>
</tr>
<tr>
<td>Anna</td>
<td>Traditional</td>
<td>81.05</td>
<td>59-106</td>
</tr>
<tr>
<td>Brett</td>
<td>Traditional</td>
<td>104.4</td>
<td>74-146</td>
</tr>
<tr>
<td>Jeremy</td>
<td>Traditional</td>
<td>97.9</td>
<td>77-118</td>
</tr>
</tbody>
</table>

Table 3.5 Means and Ranges of Learning Rates of Word Identification by Group
This paragraph provides means and ranges of reading fluency or words read and word identification or words learned for each participant. Students in the phonic analysis corrective feedback condition included, Alan who obtained a mean fluency score of 83.3 (range = 53-101) and a mean word identification score of 1.2 (range = 0-4), Ricky who earned a mean fluency score of 88.2 (range = 76-146) and a mean word identification score of 1 (range = 0-3), and Sam with an obtained mean fluency score of 88 (range = 62-118) and a mean word identification score of 2.2 (range = 0-7). Students who received the interspersal of unknown to known words corrected feedback included the following: Mathew with an obtained mean fluency score of 90.3 (range = 65-110) and a mean word identification score of 1 (range = 0-4), Robert who earned a mean fluency score of 103 (range = 84-118) and a mean word identification score of 1.4 (range = 0-4) and Danny with an obtained mean score of 89.6 (range = 72-107) and a mean word identification score of 2.3 (range = 0-4). Finally, in the traditional feedback condition, Anna earned a mean fluency score of 81.05 (range = 59-106) and a mean word identification score of 1.5 (range = 0-4), Brett obtained a mean fluency score of 104.4 (range 74-146) and a mean word identification score of 2.5 (range = 0-9), and Jeremy with an earned mean fluency score of 97.9 (range = 77-118) and a mean word identification score of 4.5 (range = 0-3).
<table>
<thead>
<tr>
<th>Participant</th>
<th>Condition</th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alan</td>
<td>Phonic Analysis</td>
<td>1.2</td>
<td>0-4</td>
</tr>
<tr>
<td>Ricky</td>
<td>Phonic Analysis</td>
<td>1.0</td>
<td>0-3</td>
</tr>
<tr>
<td>Sam</td>
<td>Phonic Analysis</td>
<td>2.2</td>
<td>0-7</td>
</tr>
<tr>
<td>Mathew</td>
<td>Interspersal</td>
<td>1.0</td>
<td>0-4</td>
</tr>
<tr>
<td>Robert</td>
<td>Interspersal</td>
<td>1.4</td>
<td>0-4</td>
</tr>
<tr>
<td>Danny</td>
<td>Interspersal</td>
<td>2.3</td>
<td>0-4</td>
</tr>
<tr>
<td>Anna</td>
<td>Traditional</td>
<td>1.5</td>
<td>0-4</td>
</tr>
<tr>
<td>Brett</td>
<td>Traditional</td>
<td>2.5</td>
<td>0-9</td>
</tr>
<tr>
<td>Jeremy</td>
<td>Traditional</td>
<td>4.5</td>
<td>0-3</td>
</tr>
</tbody>
</table>

Table 3.6 Means and Ranges of Words Learned by Individual

**Baseline and Progress Monitoring.** The Dynamic Indicators of Basic Literacy Skills, 6th Edition (DIBELS) was used to collect pre-assessment (baseline) and post-assessment reading fluency scores as well as progress monitoring data collected after session 10. See chapter 2 for a description of DIBELS procedures. Table 3.7 provides individual reading fluency scores collected for pre-assessment, progress monitoring and post-assessment. Seventy-eight percent of students increased reading fluency scores from pre-assessment to progress monitoring (all except Danny and Anna). Improvements in reading fluency from progress monitoring to post-assessment were seen in 75% of participants (all except Mathew and Robert) Ricky was not counted in the calculation of...
this percentage due to his move out of the school district after session 18. Overall, 89% of students increased their reading fluency scores from pre-assessment to the end of the intervention.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Condition</th>
<th>Baseline/Pre-Assessment</th>
<th>Progress Monitoring</th>
<th>Post-Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alan</td>
<td>Phonic Analysis</td>
<td>48</td>
<td>55</td>
<td>45</td>
</tr>
<tr>
<td>Ricky</td>
<td>Phonic Analysis</td>
<td>73</td>
<td>77</td>
<td>96</td>
</tr>
<tr>
<td>Sam</td>
<td>Phonic Analysis</td>
<td>76</td>
<td>78</td>
<td>96</td>
</tr>
<tr>
<td>Mathew</td>
<td>Interspersal</td>
<td>45</td>
<td>68</td>
<td>59</td>
</tr>
<tr>
<td>Robert</td>
<td>Interspersal</td>
<td>69</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Danny</td>
<td>Interspersal</td>
<td>69</td>
<td>55</td>
<td>74</td>
</tr>
<tr>
<td>Anna</td>
<td>Traditional</td>
<td>55</td>
<td>50</td>
<td>58</td>
</tr>
<tr>
<td>Brett</td>
<td>Traditional</td>
<td>70</td>
<td>80</td>
<td>87</td>
</tr>
<tr>
<td>Jeremy</td>
<td>Traditional</td>
<td>73</td>
<td>94</td>
<td>96</td>
</tr>
</tbody>
</table>

Table 3.7 Pre-Assessment, Progress Monitoring, and Post-Assessment Fluency by Individual

Interobserver Agreement

Interobserver agreement was calculated for the dependent variables, words read and words learned, for 20% of the total instructional sessions (36 out of 180 sessions).
Percent agreement was obtained by, dividing the total number of agreements by the total number of agreements plus disagreements and multiplying that figure by 100. The percent agreement for this study was 100%.

The formula for interobserver agreement is:

\[
\frac{\text{Number of Agreements}}{\text{Number of Agreements} + \text{Disagreements}} \times 100 = \% \text{ Agreement}
\]

**Procedural Integrity.** Procedural integrity was monitored through the use of treatment integrity or procedural checklists created for each corrective feedback instructional condition (see Appendices A, B, and C) for 20% of the sessions. An independent observer, who was trained in the procedures of the study, completed this checklist. Session integrity was 100% for all sessions observed. In other words, the procedures for instruction and use of materials were consistently followed during the study.
CHAPTER 4

DISCUSSION

This study investigated the effects of three specific types of delayed corrective feedback for words read incorrectly during repeated readings (oral reading fluency instruction) of connected text to identify which technique, if any, was most effective and which was most efficient for improving student’s oral reading fluency and word identification skills. In this chapter, findings of the current study are presented below, according to the four research questions. Results are further discussed in light of past research. Limitations of the present study, as well as suggestions for future research and implications for practice are also provided.

1) Which type of corrective feedback method, word boxes (phonic analysis), interspersal unknown to known, or traditional whole word, is most effective for helping children read words in a passage fluently (quickly and accurately)?

The first research question posed in this study sought to identify the most effective type of corrective feedback approach in helping student’s improve fluency of words read during oral repeated readings. Results indicate that although the group mean fluency
score for the traditional feedback condition is slightly greater than the mean score for the interspersal group (see Table 3.1), the graphical representation of cumulative words read (see Figure 3.1) illustrates results for the two groups are very similar. In other words, children’s cumulative fluency gains were almost identical under the traditional and interspersal feedback conditions. Both approaches proved to be very effective in helping children to improve words read in a passage fluently. Let us not discount the improvements in fluency that appears under the phonic analysis corrective feedback condition as well. This approach was also quiet effective in improving participant’s cumulative words read. Albeit, figure 3.1 shows that the word box method was less effective than the other two approaches particularly in sessions 10 through 20.

In comparing the current study to an investigation conducted by Cates et al. in 2003, results on the effectiveness are alike. Cates et al. (2003) findings showed that the cumulative number of words mastered across all three conditions to be similar. A graph depicting instructional effectiveness showed that cumulative words learned for all three conditions (i.e. two types of intersperal methods and a traditional drill and practice) to be clustered. In the current study, students cumulative fluency scores under all three conditions are also clustered, specifically in sessions one through 9, but at session 10 the traditional and interspersal methods break away leaving the phonic analysis method at somewhat of a disadvantage in comparison. Perhaps the important consideration here is that, like the Cates et al (2003) investigation, which used the same calculations to determine cumulative words learned by group (i.e. cumulative word read here) as the current study, all three approaches to feedback are close in terms of the effects that were seen on participant’s cumulative reading fluency.
Findings of the current study support research on the effectiveness of guided oral repeated readings that specifically include frequent practice and feedback, as a method that has a noticeable impact on children’s reading fluency attainment (Sample, 2005). Furthermore, significant empirical data support the results of the current study with reference to the effects of repeated reading on improving student’s reading fluency. Dowhower (1987) and Rasinski (2001) represent two investigations that also concluded repeated reading as an effective method for improving fluency skills. Increases in reading fluency were clearly demonstrated in the present study, and not by happenstance, but rather a result of the implementation of repeated reading in all three instructional conditions.

When comparing the results of the current study to previous research in the interspersal of unknown to known words in general, findings are similar. Past research on the effects of interspersing unknown to known material has been conducted in many areas of curriculum (i.e. math, spelling, and reading). In almost all cases cumulative gains in learning have been reported (Cuvo, Davis, & Gluck, 1991, Dunlap, 1984), as was demonstrated in the current investigation. The current study however, used a specific type of interspersal procedure called the incremental rehearsal technique (see Chapter 1 for a description), which has been shown a more effective approach when compared with other types of interspersal techniques (i.e. drill sandwich) for promoting the retention of learning (MacQuarrie et al., 2002). MacQuarrie et al. (2002) investigation identified the incremental rehearsal approach to be significantly more effective than a traditional drill and practice a drill sandwich in improving retention of information. The current study
found somewhat varied results, with the incremental rehearsal technique and the traditional drill resulting in almost the same cumulative learning in reading fluency.

The current study was also aimed at expanding upon research on the effectiveness of a contemporary phonics approach to literacy instruction compared to that of whole word instruction (i.e. traditional drill and interspersal). Findings of this particular investigation demonstrate the whole word approach is more effective in increasing reading fluency than the phonics approach (i.e. word boxes). Results corroborate Browder and Xin’s 1998 metanalysis of 48 separate studies since 1980, which also supported sight word or whole word instruction as a very effective approach in producing rapid skill acquisition. When considering these results, take into consideration a noteworthy drawback of whole word instruction that Browder and Xin (1998) mentioned in their investigation. Which is that sight word instruction falls short of demonstrating that students understand words, because often students who are learning sight words, when learning to read, lack important word identification skills that could be acquired under a phonics approach to instruction. For instance, the ability to separate letter sounds in order to discriminate between words (Browder & Xin, 1998).

2) Which type of corrective feedback method is most efficient (as measured by how many words are read fluently per minute for each instructional condition) for helping children read words in a passage fluently?

Cates et al. (2003), determined student learning is affected by efficient instruction that maximizes the number of learning opportunities and minimizes the amount of time
involved in those learning opportunities. The most instructionally efficient approach is considered the one in which students learn the greatest amount of material in the shortest amount of time. The findings of this investigation indicate the method most efficient for improving student’s reading fluency was the traditional drill technique. Under the traditional condition, children were found to have the greatest cumulative learning rate of reading fluency (see Figure 3.2). That is, this method was most efficient for helping children to read the greatest number of words, during repeated readings, in the least amount of instructional time. Children receiving traditional corrective feedback for miscues obtained the highest mean reading fluency rates of all three instructional conditions (see Table 3.2). The interspersal of unknown to known words was found to be the next most efficient, with the phonic analysis group showing the lowest cumulative learning rate of reading fluency.

According to Cates et al. (2003), albeit “many interventions can enhance learning (i.e. they are effective), not all are likely to be equally efficient” (p. 602). Efficient interventions make the most of instructional time, by offering students the greatest opportunities for learning. Cates et al., makes a persuasive argument for considering instructional efficiency, and so this investigation aimed to find the most efficient method for teachers to use in the classroom with repeated readings to improve reading fluency. Intriguingly, the results of the current study related to efficiency correspond to the findings in the Cates et al., (2003) investigation. When the amount of instructional time is taken into consideration, both studies found that students as a group learned more words under the traditional drill condition. It makes sense that the traditional drill was determined to be most efficient in this case when considering this approach with respect
to the other two types of corrective feedback used in the study. Traditional drill is a flashcard method. It is quick because students practice miscues (i.e. word read incorrectly during repeated readings) in a drill fashion reviewing each error presented on a flashcard, with immediate verbal feedback provided by the instructor for mispronunciations only. Even with many errors the corrective feedback technique only takes a short time (i.e. approximately 1 to 2 minutes).

Now let us consider the other two approaches. The incremental rehearsal technique, which is one type of interspersal of unknown to known items, provides students with greater exposure to unknown words increasing the likelihood of retention of learning (MacQuarrie et al., 2002), however it is probably not the most efficient approach do to the routine administration which requires a series of exposures to the same unknown (to be learned) words (see chapters 1 and 2 for a description of incremental rehearsal). The word box technique offers students the opportunity to gain skill in letter-sound correspondence (Joseph, 1998, 1999, 2000a, 2000b, 2000c, Joseph & Davault, 2004), an important precursor to letter word identification, as well as accurate and rapid reading (Maletasha & Aaron, 2002). Unfortunately in terms of its efficiency, this contemporary phonics technique can be time consuming, especially as the number of words instructed on increases (see chapters 1 and 2 for a description of word boxes). Information regarding the effects of these three types of corrective feedback on children’s learning rate of reading fluency adds to existing research that has not yet considered efficiency of oral reading instruction in the area of reading fluency.
3) Which type of corrective feedback method is most effective for increasing children's word identification (i.e. accuracy) during repeated readings?

Here we shift from reading fluency to word identification as the dependent variable. The current study explored the effectiveness of each type of corrective feedback, provided for words previously read inaccurately, on student's word recognition (i.e. accuracy) during repeated oral reading. Results indicate the traditional whole word approach was slightly more effective when comparing group means (see Figure 3.3). Note however, that cumulative words learned, which is a measure of word identification, were very similar for both the traditional and phonics technique throughout instructional sessions. Figure 3.3 illustrates a comparison of each instructional condition on student's cumulative words learned. Table 3.3. shows the mean words learned by group is only ever so slightly greater for student's in the traditional condition than the group mean seen in the phonic analysis condition. The interspersal method was determined to be the least effective method for producing improvement in students word identification during oral repeated reading instruction. Findings of the current study indicate that the traditional and phonic analysis corrective feedback methods were both very effective for helping students to read previous miscues accurately during repeated readings, and that although cumulative gains were established under the interspersal technique, this method was less effective than the other two approaches.

To date, there has been little research on the utility of word boxes used specifically as a method of corrective feedback for miscues during repeated readings. An abundance of past research has indicated that this phonics analysis method aids children with reading
problems with the acquisition of phonemic awareness and overall word identification skills (Joseph 1998, 1999, 2000a, 2000b, 2000c). This study contributes to the current body of knowledge, by demonstrating the effectiveness of word boxes as a successful technique for increasing word identification skills when used as corrective feedback for errors during oral reading instruction, particularly with fluency instruction (i.e. repeated readings).

There is also very minimal research currently on interspersal training with oral reading instruction, specifically on the effectiveness of this method as correct feedback for improving word identification skills in conjunction with repeated reading. The current study does not support this method to be the most effective under the conditions of the study. Results of study vary with respect to MacQuarrie et al., (2002), which found the incremental technique significantly more effective for helping children retain newly learned information when compared to another interspersal approach. Although we know that in the present study the incremental rehearsal method was not as effective for producing cumulative words learned when compared to traditional and phonic analysis, the utility of this approach in relation to other interspersal techniques may hold true. This is a conclusion that cannot be determined from the current study, albeit we do know that children who receive corrective feedback for miscues during oral fluency instruction do experience cumulative learning as a result (see Figure 3.3).

There has been a considerable amount of past research supporting the traditional whole word drill as a successful approach producing rapid skills acquisition of children with disabilities (Browder & Xin, 1998). This current study adds to previous research
with results that indicate traditional drill is very effective as a corrective feedback
technique for improving word identification skills during oral reading fluency instruction.

4) **Which type of corrective feedback method is most efficient for increasing children's**
word identification skills (i.e. accuracy) during repeated readings?

Previous research on efficiency of instruction contends student learning rate is
influenced by efficient instruction (Cates et al., 2003). The idea is that efficient
instruction maximizes the number of learning trials and minimizes the amount of time
involved in learning trials (Cates et al., 2003). Here we will look at the differences in the
three instruction conditions with regard to cumulative learning rate of word identification
to see which method provided students with the greatest number of opportunities for
instruction in the shortest amount of instructional time (i.e. learning rate). Findings
indicate the traditional drill was most efficient for improving student’s word
identification skills. Under the traditional condition, children were found to have the
highest cumulative learning rate of word identification (see Figure 3.4). That is this
method was most efficient for helping children to learn the greatest number of words in
the least amount of instructional time. Figure 3.4 illustrates the cumulative learning rates
of word identification for all three corrective feedback conditions. The graph clearly
demonstrates the traditional drill as most efficient. Note that the present study found the
traditional drill to be the most efficient in cumulative learning rate of reading fluency as
well. The traditional drill and practice was determined the most time efficient approach to
helping students read connected text fluently, as well as accurately. The graph also shows

65
that the phonic analysis and interspersal techniques were very close in overall efficiency. That is, both approaches produced very similar learning rates in word identification.

When considering time in the evaluation of instructional procedures, results of the present study correspond to findings reported in Cates et al. (2003). Both studies found the traditional drill to be the most efficient method. These findings may prove important for building upon existing research in the arena of instructional efficiency. This study is of particular interest because it is the first to consider the efficiency of types of corrective feedback to use with oral reading fluency instruction. Findings of the current study demonstrate the efficiency of traditional drill and practice as corrective feedback for not only improving reading fluency, but also word identification (i.e. accuracy) during oral repeated reading.

Limitations

Despite the current findings that support the cumulative effectiveness of all types of corrective feedback used in the current study, and the clear demonstration of the traditional whole word drill as the most efficient method of corrective feedback to use with repeated reading to improve reading fluency, as well as word identifications skills for children with delays in reading, the current study is not without limitations. First, the current study was conducted with a small sample of nine students with only three students in each instructional condition. The small sample size reduces the ability to generalize the results without further empirical support for such findings. As a result, additional research that replicates the current study is needed to support the results of the present study.
A second limitation involves keeping instructional procedures used to administer the phonic analysis approach constant through each instructional session. It was difficult for example, to ensure that the transition from instructing on one word to the next during the word box condition remained constant in each instructional instance. Students are required to be more patient with the approach as the materials are manipulated from the rehearsal of one word to the next, because transition to each new word often requires the location of a set of different letters to use in the word box technique. The student would sometimes want to help the instructor find the letters for the next word to be practiced, however there were other times in which the student refused to help. Variations in the transitioning from one word to the next, possibly contributed to variations in instructional time. For instance, the investigator may have found the letters more quickly than the student in cases in which the student was not interested in helping find the letters for the next word to be taught. Future research should make an effort to hold these instructional administration variables constant across all sessions and conditions.

Third, the current study compared only three types of corrective feedback to use for errors during oral repeated reading, there are many other approaches that could also be used in addition to the three presented here. For example, investigators may choose to compare different ratios of unknown to known words with interspersal methods. Also, this study chose the word box approach, however there are many other phonic analysis approaches that could be used and compared for effectiveness, as well as efficiency of instruction. Additional research could explore different types of corrective feedback to be used with oral fluency instruction.
Fourth, the current study did not provide students with immediate feedback during repeated readings; instead a specific delayed feedback approach was used in each condition (i.e. traditional drill, phonic analysis, and interspersal of unknown to known words). This was done so as not to disturb students during one-minute repeated readings. The effects of immediate feedback during oral repeated readings could be studied by removing the timing of the repeated reading. Future researchers might consider investigating these different approaches to immediate and delayed corrective feedback.

Conclusion

This study investigated the effects of three specific types of delayed corrective feedback for words read incorrectly during repeated readings (oral reading fluency instruction) of connected text to identify which technique was most effective and which was most efficient for improving participant’s oral reading fluency and word identification skills. Results indicated, participant’s cumulative fluency gains were almost identical under the traditional drill and interspersal of unknown to known corrective feedback conditions. These two approaches were most effective. Cumulative gains in reading fluency were also seen in the phonic analysis group, although the overall effectiveness of this approach was less than the other two methods of feedback. When instructional time was considered, children in the traditional drill condition were found to have achieved the highest cumulative learning rate of reading fluency. Traditional feedback was the most efficient. A similarity was revealed between the traditional and phonic analysis group in the cumulative words learned or instructional effectiveness, a measure of word identification. Both of these methods were found very effective for increasing student’s accuracy during oral repeated readings. Finally, results indicated
children receiving the traditional corrective feedback for errors during oral reading had the highest learning rate of word identification. As with reading fluency, this technique was most efficient for helping children reading the most words accurately in the shortest amount of instructional time.

These findings could have significant implications in the field of education and school psychology. School psychologists may use this information when collaborating with teachers who are looking for efficient methods of oral reading instruction. Teachers are required to organize their time by the most efficient means possible. When given a choice between different interventions, educators would likely use the intervention that has been found effective as well as time efficient. In this case, it is the traditional approach.

Studies such as the current one, also introduce various methods of corrective feedback teachers can use with confidence to ensure students are going to experience cumulative gains in learning effectiveness over time.
LIST OF REFERENCES


Joseph & Devault, 2004. Repeated readings combined with word boxes phonics technique increases fluency levels of high school students with severe reading delays. *Preventing School Failure, 49*(1), 22-27.


APPENDIX A

TREATMENT INTEGRITY CHECKLIST: REPEATED

READINGS AND WORD BOX
### Treatment Integrity Checklist: Repeated Readings and Word Box

#### Intervention Procedures *(Criterion Level = 90 words correct per minute on two consecutive readings)*

<table>
<thead>
<tr>
<th>Step 1: Initial Reading (only done the first time a new passage is presented)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Present the student with instructional level reading passage. Provide directions: <em>&quot;Start here (point to starting point in text). Read out loud as quickly as you can. If you come to a word you do not know just try your best. I will tell you when to stop. Are you ready? Okay, begin.&quot;</em> Reading is timed for one-minute. After one-minute instructor says, &quot;Stop.&quot;</td>
<td>YES</td>
</tr>
</tbody>
</table>

#### Step 2: Word Box

**BEGIN TIMING SESSION**

Place the word box materials in front of the student (i.e. dry-erase board/marker, plastic/foam alphabet letters, and note cards) and say, *"Now we are going to practice the words that you had some trouble reading."*

**Word Box Script:**

1. On a note card, write the first word read inaccurately during the oral reading.
2. Draw a large rectangle on the dry erase board. Separate the rectangle into boxes that correspond to the number of word sounds or phonemes. Do this by drawing one or more vertical lines to make boxes for individual word sounds. Each box should be equal in size. (i.e. three boxes for phonemes heard in the word D-O-G)
3. Place the note card above the dry erase board. Point to the word and say, *"This word is... (say word here i.e. DOG)."
4. Place the plastic letters of the word underneath the divided rectangle, with letters under each box corresponding to sounds heard in the word. (i.e. D-O-G)
5. Slowly slide the letters (or letter group) up one-by-one into their corresponding sections while saying each letter (or letter group) sound.
6. Run finger under word and pronounce word again slowly, putting emphasis on each phoneme. Say the word once again blending sounds together.
7. Slide letters back beneath the rectangle. Now it is the student’s turn. Say, "Now you try. Say each sound of the word as you slide the letter(s) into the correct section of the rectangle" If correct praise student (i.e. "Great job!") If incorrect, model procedure and allow student to try again.
8. Positional Analysis: Ask the student where he/she hears each sound of the word. Be sure to vary the order of the phonemes. For example if the word is DOG, ask “Where do you hear the /g/ sound? Where do you hear the /d/ sound?” Continue until student correctly identifies all word sounds. If student provides incorrect response provide feedback on correct sound position. (i.e. “That’s not quite right, in the word ‘DOG’ the /g/ sound is at the end.” Allow child to try again.
9. Finally ask, "What is this word?"

*Repeat Word Box technique for each remaining word read incorrectly in oral reading.

#### Step 4: Repeated Reading

Present the student with instructional level reading passage. Provide directions: *"Start here (point to starting point in text). Read out loud as quickly as you can. If you come to a word you do not know just try your best. I will tell you when to stop. Are you ready? Okay, begin."* Reading is timed for one-minute. After one-minute instructor says, "Stop."

***STOP TIMING SESSION***
<table>
<thead>
<tr>
<th>Step 5: Student Data Collection Chart</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete <strong>Repeated Readings</strong> portion of chart with the following information: # correct words, # incorrect words, # new words, # sentences with expression, &amp; total time in sec.</td>
<td>NO</td>
</tr>
</tbody>
</table>
APPENDIX B

TREATMENT INTEGRITY CHECKLIST: REPEATED READING AND INCREMENTAL REHEARSAL
Treatment Integrity Checklist: Repeated Readings and Incremental Rehearsal

Criterion Level = 80 words correct per minute on two consecutive readings

<table>
<thead>
<tr>
<th>Intervention Procedures</th>
<th>Circle One</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Initial Reading</strong> (only done the first time a new passage is presented)</td>
<td>YES</td>
</tr>
<tr>
<td>Present the student with instructional level reading passage.</td>
<td>NO</td>
</tr>
<tr>
<td>Provide directions: <em>Start here (point to starting point in text). Read out loud as quickly as you can. If you come to a word you do not know just try your best. I will tell you when to stop. Are you ready? Okay, begin.</em> Reading is timed for one-minute. After one-minute instructor says, “Stop”.</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2: Student Data Collection Chart</strong></td>
<td>YES</td>
</tr>
<tr>
<td>Fill out Initial Reading. Record the following: passage #, words read correctly, &amp; unknown words.</td>
<td>NO</td>
</tr>
</tbody>
</table>

**Step 3: Incremental Rehearsal**
**BEGIN TIMING SESSION**

Prepare note cards with a 6:1 ratio of known to unknown words; there should be 7 note cards; six with known words and one with an unknown word. Say, *"Now we are going to practice some words."*

<table>
<thead>
<tr>
<th>Incremental Rehearsal Script:</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Present the first unknown word, then the first known word.</td>
<td>NO</td>
</tr>
<tr>
<td>2. Present the first unknown word, then the first and second known word.</td>
<td></td>
</tr>
<tr>
<td>3. Present the first unknown word, then the first, second, and third known word.</td>
<td></td>
</tr>
<tr>
<td>4. Present the first unknown word, the n the first, second, third, and fourth known word.</td>
<td></td>
</tr>
<tr>
<td>5. Present the first unknown word, then the first, second, third, fourth, and fifth known word.</td>
<td></td>
</tr>
<tr>
<td>6. Present the first unknown word, then the first, second, third, fourth, fifth, and sixth known word</td>
<td></td>
</tr>
</tbody>
</table>

*When an unknown word is learned by a student and is read correctly in a subsequent repeated reading, the unknown word becomes a known word and an old known word is removed from the note card list.*

**Step 4: Repeated Reading**

Present the student with instructional level reading passage. Provide directions: *"Start here (point to starting point in text). Read out loud as quickly as you can. If you come to a word you do not know just try your best. I will tell you when to stop. Are you ready? Okay, begin."*

Reading is timed for one-minute. After one-minute instructor says, “Stop.”

**STOP TIMING SESSION**

**Step 5: Student Data Collection Chart**

Complete Repeated Readings portion of chart with the following information: # correct words, # incorrect words, # new words, # sentences with expression, & total time in sec.

| YES | NO |
APPENDIX C

TREATMENT INTEGRITY CHECKLIST: TRADITIONAL

WHOLE WORD RECOGNITION
**Treatment Integrity Checklist: Traditional Whole Word Recognition**

Criterion Level = 80 words correct per minute on two consecutive readings

<table>
<thead>
<tr>
<th>Intervention Procedures</th>
<th>Circle One</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Initial Reading</strong> (only done the first time a new passage is presented)</td>
<td></td>
</tr>
<tr>
<td>Present the student with instructional level reading passage.</td>
<td></td>
</tr>
<tr>
<td>Provide directions: &quot;Start here (point to starting point in text). Read out loud as quickly as you can. If you come to a word you do not know just try your best. I will tell you when to stop. Are you ready? Okay, begin.&quot;</td>
<td></td>
</tr>
<tr>
<td>Reading is timed for one-minute. After one-minute instructor says, &quot;Stop&quot;.</td>
<td>YES</td>
</tr>
<tr>
<td><strong>Step 2: Student Data Collection Chart</strong></td>
<td>NO</td>
</tr>
<tr>
<td>Fill out Initial Reading. Record the following: passage #, words read correctly, &amp; unknown words.</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3: Incremental Rehearsal</strong></td>
<td></td>
</tr>
<tr>
<td><strong>BEGIN TIMING SESSION</strong></td>
<td></td>
</tr>
<tr>
<td>Prepare note cards with the words that the student missed during the oral reading. Say, &quot;Now we are going to practice some words that you had trouble reading.&quot;</td>
<td></td>
</tr>
<tr>
<td>Traditional Whole Word Recognition Script:</td>
<td></td>
</tr>
<tr>
<td>1. Present each note card one at a time; the instructor says the word first and has the student repeat.</td>
<td></td>
</tr>
<tr>
<td>2. Each note card is presented again and the student is asked to read the words.</td>
<td></td>
</tr>
<tr>
<td>3. The instructor provides corrective feedback when necessary.</td>
<td>YES</td>
</tr>
<tr>
<td><strong>NO</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Step 4: Repeated Reading</strong></td>
<td></td>
</tr>
<tr>
<td>Present the student with instructional level reading passage.</td>
<td></td>
</tr>
<tr>
<td>Provide directions: &quot;Start here (point to starting point in text). Read out loud as quickly as you can. If you come to a word you do not know just try your best. I will tell you when to stop. Are you ready? Okay, begin.&quot;</td>
<td></td>
</tr>
<tr>
<td>Reading is timed for one-minute. After one-minute instructor says, &quot;Stop.&quot;</td>
<td></td>
</tr>
<tr>
<td><strong>STOP TIMING SESSION</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>NO</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Step 5: Student Data Collection Chart</strong></td>
<td></td>
</tr>
<tr>
<td>Complete Repeated Readings portion of chart with the following information: # correct words, # incorrect words, # new words, # sentences with expression, &amp; total time in seconds</td>
<td>YES</td>
</tr>
<tr>
<td><strong>NO</strong></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D

INCREMENTAL REHEARSAL SCRIPT
Incremental Rehearsal Script

1. On six note cards, write a word read accurately during the oral reading.

2. On one note card, write a word read inaccurately during the oral reading.

3. Present the first unknown word, then the first known word.

4. Present the first unknown word, then the first and second known words.

5. Present the first unknown word, then the first, second, and third known words.

6. Present the first unknown word, then the first, second, third, and fourth known words.

7. Present the first unknown word, then the first, second, third, fourth, and fifth known words.

8. Present the first unknown word, then the first, second, third, fourth, fifth, and sixth known words.

*When an unknown word is learned by a student and is read correctly in a subsequent repeated reading, the unknown word becomes a known word and an old known word is removed from the note card list.*
APPENDIX E

WORD BOX SCRIPT
Word Box Script

1. Present the student with a dry erase board that contains a drawn rectangle.

2. Prior to presenting the word, divide the rectangle into the number of sections which corresponds to the phonetic segmentation of the word about to be presented.

3. Place a note card with the word above the dry erase board and say, "This word is "CAT""

4. Place the letters of the word underneath the divided rectangle.

5. Say, "Watch me make the word and listen as I sound it out"

6. Push the letters up into their corresponding sections while saying each letter (or letter group) sound. "C-A-T"

7. Run your finger underneath the word slowly and slowly pronounce the word putting slight emphasis on each phoneme. Run your finger underneath the word again this time much faster and say the word without segmentation.

8. A.) Push the letters back down beneath the rectangle and say "Now it's your turn! Say each sound of the word as you place the letter(s) in the proper section of the rectangle."
   - If correct, say "Good Job!"
   - If incorrect, model the correct procedure and prompt the student to give the correct response.

B.) Also have student run finger underneath the word as in #7

9. Positional Analysis
   - "Where did you hear the /a/ sound?" (etc.)
   - Student should push corresponding letter into the correct section.
   - If correct, say "Good job! The /a/ sound is in the middle of the word Cat."
   - If incorrect, model the correct procedure and prompt the student to give the correct response.
     Ex. "Let's try again, c-a-t, the /a/ sound is heard here..." (push "A" into the middling position of the rectangle)... "in middle of the word cat."

10. Ask the student "What's this word?"
    - If student hesitates or is having trouble, prompt him/her to sound the word out.

85
APPENDIX F

TRADITIONAL WHOLE WORD RECOGNITION SCRIPT
Traditional Whole Word Recognition Script:

4. Present each note card one at a time; the instructor says the word first and has the student repeat.

5. Each note card is presented again and the student is asked to read the words.

The instructor provides corrective feedback when necessary.