A COMPARATIVE STUDY
OF ASSISTED PRACTICE AND SELF-REGULATION:
INTERVENTIONS TO IMPROVE
FLUENCY AND COMPREHENSION FOR STRUGGLING
READERS

by

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Abstract

The aim of this study was to investigate the efficacy of two interventions to improve reading fluency and reading comprehension for forty struggling readers ages 8-10. A “Strategies Group” was instructed in use of reading fluency strategies; the students were encouraged to self-reflect on errors to find ways to correct them. A “Repeated Reading Group” emphasized repeated/timed reading. Both groups received additional instruction in phoneme awareness and phonics. Results showed individual gains on curriculum based measures of reading fluency for participants in both groups. Gains on more distal measures of reading fluency and reading comprehension were not statistically detectable. The results have clear implications for teaching practice.

Keywords:

reading fluency, repeated reading, reading comprehension, reading strategies
To Patrick

for his love, support, guidance, and calm demeanour.

To my parents, family and friends

for their support and ability to take my mind off of the pressure. Thank you for taking the time to ask me how things were going and for keeping me motivated to finish.

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CHAPTER 1

Introduction

For many students the ability to read and comprehend occurs easily. For others learning to read is a difficult process. The problem for many such children is not just basic word identification. Unfortunately, quick word identification does not necessarily lead to reading fluency. Reading fluently involves more than reading a certain number of words per minute (NICHD, 2000). Children who read with fluency have acquired knowledge of text attributes and are able to read with prosody (Allington, 1983; Dowhower, 1987; Fitzgerald & Shanahan, 2000). A fluent reader reads automatically, accurately and organizes text into meaningful phrases at an appropriate rate (Kuhn & Stahl, 2000). Research has shown that despite improvements in decoding and word reading accuracy, difficulties with reading fluency are difficult to remediate (Lyon, 1997).

Reading connected text fluently and effortlessly is a goal that is rarely met by children and adults with reading disabilities (Vaughn et al., 2000). Children with reading difficulties read slowly, word by word, may make errors in decoding phoneme-grapheme relations or may make omissions, substitutions and repetitions. These struggling readers can be characterized as non-fluent readers.
"Non-fluent" refers here to slow, halted and inaccurate oral reading, lacking in appropriate phrasing and expression.

Prior to the launch of the National Reading Panel report on reading fluency in 2000, reading fluency research was lacking. In the 1990's much of the research focused on early intervention. Remediation of word level skills and attention to processes like word identification and phonological awareness dominated the field of reading research. Substantial research on early reading interventions and phonological awareness training for early primary students exists (Blachman, 1994). However, a considerable number of children continue to struggle with reading into the intermediate grades. Limited research of late primary and intermediate students who continue to struggle with reading despite years of instruction is available (O'Connor et al. 2002).

1.1 Interventions for Improving Fluency

Repeated reading (RR), as originally conceptualized by Dahl (1974) and Samuels (1979), is the most widely researched and most frequently cited method for improving reading fluency. RR is based on an information processing model which posits that fluent readers are those who decode text automatically therefore conserving attention and energy for comprehension (Meyer & Felton, 1999). In simple terms, repeated reading means that a student is required to reread text at their instructional reading level, either silently, orally or a combination of both, until mastery occurs. They are timed when they read and their words per minute and number of errors are graphed (Rashotte & Torgesen, 1985; Meyer & Felton, 1999).
Although there are many variations of the repeated reading method, two main approaches dominate reading fluency research: assisted repeated reading and unassisted repeated reading. Assisted repeated reading involves working with an adult or peer who models appropriate reading of the text or the student is provided with a taped model of fluent reading. Other forms of guided reading also accompany assisted reading like: 1) choral reading or neurological impress, where the model reader and student read together at a rapid pace and 2) echo reading where the model reader reads just ahead of the learner. Unassisted repeated reading means that the student repeatedly reads independently with no model of fluent reading provided (Meyer & Felton, 1999; Kuhn & Stahl, 2003).

Research shows that repeated reading is an effective method for improving reading rate and word accuracy (Rashotte & Torgesen, 1985; Dowhower, 1987; Sindelar, Monda & O’Shea, 1990; Chard, Vaughn & Tyler, 2002). Whether RR also improves children’s reading comprehension requires further investigation and therefore RR was chosen as the preferred method of instruction for this reading intervention study.

Many researchers have examined the relationship between reading fluency and decoding (LaBerge & Samuels 1974; Biemiller, 1977/78; Allington, 1983) but few studies have investigated the suspected correlation between fluency and comprehension for poor readers beyond the primary grades.

Further, few interventions in use involve a metacognitive component in which children reflect on their reading fluency performance. Having children reflect upon their oral reading fluency
performance may strengthen the efficacy of the repeated reading intervention. To date, support for the idea that cognitively reflecting upon the products of reading may improve reading performance is found primarily in the reading comprehension literature.

For example, research has shown that skilled readers are strategic when they read: their goal is to understand what they read and they do this by self-regulating, visualizing and making adjustments to their reading approach depending on the type of text being read (Palinscar & Brown, 1984; Pressley et al, 1994; Westby, 2004). Proficient readers are motivated, seek information and use existing knowledge to scaffold new information as they read. They re-read, reflect on the information, construct summaries and may read more slowly when they deem a passage to be relevant. These readers fix any comprehension difficulties they may have by looking up words, stopping to think and putting text into their own words (Palinscar & Brown, 1984; Pressley et al, 1994; Westby, 2004). Good readers may or may not be conscious of the things they do to monitor their own reading comprehension, but all competent readers are actively engaged in processing text. When interviewed about what they do when they read, most successful readers can easily reflect on the strategies they use. This is not the case for many struggling readers. Importantly, interventions to improve the reflective practices of struggling readers have been shown to result in gains in reading comprehension (Pressley et al., 1994; Pressley, 2002).

Although the research findings supporting the efficacy of strategy instruction for improving children's reading comprehension are robust, whether having children reflect upon what they are doing as they try to read fluently improves oral reading fluency is not well understood. One possibility is that helping children become more
reflective and strategic about what they are doing as they read may result in improvements in their oral reading fluency. Alternatively, having children stop and focus on the strategies they are using while reading may interfere with and slow the oral reading process by distracting them from the task of trying to read fluently.

1.2 Research Questions

The purpose of this study was twofold. First, the study examined the efficacy of two different approaches for improving the oral reading fluency of poor readers in the intermediate grades. In one intervention, children were instructed using a repeat reading strategy that has been empirically validated in previous research (Rashotte & Torgesen, 1985; Chard, Vaughn & Tyler, 2002). In the other intervention, children were instructed to reflect upon the processes by which they were learning to read more fluently and to use this knowledge to improve oral reading performance. A second aim of the research was to investigate whether or not the two reading fluency interventions improved the children's reading comprehension.

The following two questions guided the study:

1) Is an intervention that instructs children to reflect upon their oral reading practice and to use this knowledge to improve their oral reading rate superior to a repeated reading intervention at improving children's oral reading fluency?

2) Do interventions to improve oral reading fluency result in gains in reading comprehension for children who are poor readers in the intermediate grades?
CHAPTER 2

Literature Review

This review of the literature is organized into four sections. First, models that explain children’s reading fluency development are discussed. Second, theories that attempt to address why students may struggle with reading fluency are examined. Next, a review of intervention studies is followed with an endorsement of strategies instruction.

2.1 Development of Reading Fluency

In an early study of reading fluency, Biemiller (1977/1978) examined the relationships between oral reading rates for letters, words and text and overall reading achievement in 281 children in grades 2-6 and 20 adults over the age of 20 years. Biemiller used two measures to assess reading achievement. The Metropolitan Achievement Test (MAT) was used to assess reading comprehension and a miscue analysis was used to measure the frequency of errors in the rapid automatic naming of letters, words and the reading of passages. “Multiple regression analysis was used to examine the contributions of letter and word time variance to text time variance, and the contributions of all 3 times to MAT reading scale variance” (p.231). Letter time variance alone contributed the largest portion of text time variance for all grades.
This finding suggests the existence of individual differences in speed of identification of letters and figures and individual differences in the use of orthographic knowledge. Less able children required more time to read letters, words in isolation and text than more capable or older children or adults. Less time was required to identify words in context than letters or words in isolation. Younger children take longer to read words in isolation than letters, while older children take about the same time to identify either letters or words. In a discussion of results, Biemiller asked a pertinent question: “Why do good readers identify words as fast as letters while poor readers take longer to identify words?” (p. 248). This query has been the topic of debate amongst researchers for years.

Reading requires multilevel processing, including the decoding of individual words, to derive meaning from text as a whole (Logan, 1997). Chall (1996) presented a broad model of reading development that includes six stages through which readers proceed. At the earliest stage of reading, described by Chall (1996) as Stage 1: Literacy Roots, children are learning about the world and that print has a communicative function.

In the second Stage of Chall’s model of reading development, Initial Literacy, self-monitoring begins to take place (Chall, 1996). Most children in Stage 2 are gaining knowledge about sound-symbol relationships. As they acquire reading sub-skills like phonemic awareness and word identification they move to the fluency phase of development or Stage 3 (Chall, 1996). According to Chall, readers in Stage 3 consolidate what they learned earlier and develop the ability to read words on sight and internalize strategies to read unfamiliar words.
Most students move quickly from Stage 1 to Stage 3 and as the years progress they become accomplished readers and reach Stage 6. At this final Stage of reading development students are able to analyze, synthesize and apply what they read (Chall, 1996; Fitzgerald & Shanahan, 2000). Many students with reading difficulties seem to remain locked in Stage 2. They may read in a monotone voice, word by word, hesitating to decode even the most frequently occurring words. Students with reading difficulties read dysfluently despite even the most valiant efforts by parents and educators to intervene. Developing reading fluency does not come easily for these students (Young & Bowers, 1995).

2.2 Constraints on Reading Fluency

According to Stanovich (1986), attempts have been made to link a number of cognitive processes to reading ability. Research has shown (LaBerge & Samuels, 1974; Biemiller, 1977/1978; Allington, 1983; Stanovich, 1986; Meyer & Felton 1999; Wolf, Bowers & Biddle, 2000) that sources of reading dysfluency may include: lack of phonological awareness, word recognition difficulties, deficits in visual processing, slow information processing skills, slow naming speed and limited exposure to print. There is also evidence supporting the assertion that some linkages are more robust than others (Stanovich, 1986; Meyer & Felton, 1999; Wolf, Bowers & Biddle, 2000). Meyer and Felton (1999) list three major causes of reading dysfluency:

1. A breakdown in lower level processes such as phonological processing and/or orthographic processing that affect the timing and coordination of these systems.
2. Deficits occurring after perceptual identification has been completed (e.g., slow retrieval of names, meaning or both).

3. Syntactic processing deficits exhibited by lack of prosody and rhythm in oral reading.

Other researchers argue that deficits in two cognitive-linguistic abilities, phonological awareness and rapid automatic naming, are the most prominent contributors to overall reading difficulties (Young & Bowers, 1995; Torgesen et al., 1999; Bowers & Newby-Clark, 2002).

**Double-Deficit Hypothesis**

Wolf, Bowers and Biddle (2000) proposed a double-deficit hypothesis of reading disability which posits that the integration of poor phonological processing and naming-speed deficits lays at the core of the most serious reading disabilities. Students with deficits in phonological awareness only will likely have poor decoding accuracy, whereas students with deficits in rapid naming only will likely have poor sight word recognition skills (Wolf, Bowers & Biddle, 2000). Children with deficits in both areas are thought to be at even greater risk for dysfluent reading than a child with a problem in only phonological awareness or rapid naming (Wolf, Miller & Donnelly, 2000). In school, this may mean that children with only one deficit are referred for short term support in reading, but students with deficits in more than one area will likely remain in remedial reading programs over extended periods of time (Blachman, 1994).
Rapid Naming

Extensive research is available to support the notion that severely impaired readers have naming speed deficiencies (Wolf & Bowers 1999). Naming speed refers to the ability to name familiar visual symbols such as numbers, letters, colours and simple objects under timed conditions (Wolf, Bowers & Biddle, 2000).

Rapid automatic word recognition is vital to proficiency in reading (Stanovich, 1986). In order for students to read fluently they need to be able to decode words accurately and quickly. If a reader drains their cognitive capacity in their effort to accurately identify even the most frequently occurring words, little capacity is left to comprehend text (Nathan & Stanovich 1991).

Research has shown that reading fluency is linked to overall reading competence, and more specifically reading comprehension (Biemiller, 1977-1978; Dowhower, 1987; Shinn et al., 1992; Tan & Nicholson, 1997; Fuchs, Fuchs & Hosp, 2001; Kuhn & Stahl, 2003). Although there is some debate among researchers as to the nature of the relationship between fluency and comprehension, there is general consensus that an increase in one leads to an increase in the other (Vaughn et al. 2000; O'Connor et al. 2002).

Children become proficient readers by learning to read words by sight and by decoding or using contextual cues to read unfamiliar words (Ehri, 1998). If children read too slowly and are inaccurate in their decoding, they may have extreme difficulty comprehending text. The focus, effort and concentration needed to decode words depletes cognitive resources necessary for making inferences, predictions, connections and sense of the text being read (Nathan
Comprehending text involves complex processing of words, phrases and sentences. Interruption of the integration of these processes can interfere with a child's ability to understand what they read (Young & Bowers, 1995). If the main goal of reading is to construct meaning from text, interventions to improve non-fluent reading among children with reading difficulties may also be effective at improving comprehension and are thus worthy of investigation.

LaBerge & Samuels (1974) introduced a model of automatic information processing, which postulated that slow word recognition reduces reading fluency. They argued that only when lower level reading skills (e.g., knowing letter sounds, meanings of words etc.) become automatic is the reader able to allocate effort toward acquiring comprehension skills.

Almost 30 years later, Jenkins, Fuchs, van den Broek, Espin and Deno (2003) and Bowers and Newby-Clark (2002) provided additional evidence to support LaBerge & Samuels's (1974) claim that slow word recognition leads to poor comprehension of text. Jenkins et al. compared skilled and non-skilled fourth grade readers' ability to read lists of single words and words embedded in text and found that skilled readers outperformed students with reading disabilities (RD) on measures of accuracy and speed when reading lists of words and words in context. The reading problems of children with RD were not specific to reading in context, providing support for the idea that RD students' difficulties with reading fluency appeared to stem from limited word identification skills.
Similarly, Bowers and Newby-Clark (2002) argued that poor reading fluency is an outcome of a deficit in naming speed. In this view, children with slow naming speed are less likely to use orthographic information when reading words similar to words they already know. Bowers and Newby-Clark presented an informal model of reading skill acquisition that illustrates the complexity of the interrelated cognitive processes and instructional practices that affect reading. In this model, phoneme awareness and rapid naming are independent contributors to reading skill. Word attack scores seemed to be more associated with phonemic awareness than rapid naming while word reading speed was strongly related to rapid naming.

**Matthew Effect**

There is general consensus that reading practice leads to increased fluency (NICHD, 2000). Children who find reading difficult often avoid it. For students who struggle with reading, reading text is unrewarding, fatiguing and frustrating (Stanovich, 1986). Struggling readers find themselves at a double disadvantage. Non-fluency leads to less time spent reading. Dysfluent readers may be deterred from practicing reading because they find it onerous. Subsequently, the children that require the most reading practice are the least motivated to read and spend less time actively engaged in reading than do skilled readers (Beimiller, 1977; Allington, 1983; Bowers & Newby-Clark, 2002).

Moreover, students who are non-fluent readers read less often and their orthographic knowledge is adversely affected. According to Ehri (1992) students who are sufficiently exposed to seeing letter patterns in words will be more successful at amalgamating the
visual code and pronunciation of the word and therefore will be able to read those words quickly. The less exposure students have to letter patterns the less likely they will be able to link the word with the correct pronunciation. Subsequently, the more likely they will be to avoid reading and the less chance these children will have to form orthographic images of words (Bowers & Newby-Clark, 2002).

As described by Stanovich (1986), children who are already comfortable reading text will choose to engage in reading activities independently and more often than those who find reading difficult. As the school year progresses good readers become better readers because they spend more time practicing reading than poor readers. Strong readers continue to build their word skills, reading becomes more enjoyable for them and they maintain their interest in reading. The challenge for educators is to determine the particular areas of weakness impacting poor reading performance and design an appropriate program for remediation. In their quest for an effective instructional approach, teachers turn to reading research to see “what works.”

### 2.3 Reading Fluency Interventions

Many reading fluency studies are available that have included students from primary to high school grades. Various methods for improving oral reading fluency have been used. Research continues in the field of reading in an effort to determine the instructional approaches that are most successful for improving oral reading fluency. For instance, some researchers propose that improving phonological awareness should be the first step (Lovett, et al. 2000). Disappointingly, intervention research has demonstrated that instruction in phonemic awareness improves
phonemic awareness but does little to improve reading fluency (Meyer & Felton, 1999). Many students with reading difficulties who have been able to improve their decoding skills have continued to struggle with reading fluency (Del Rosario Ortiz González, Garcia Espinél and Guzmán Rosquete 2002; Vaughn et al., 2000). Researchers have reported (Blachman, 1994; Torgesen, Wagner & Rashotte, 1994) that as many as 30% of children at risk for reading difficulties and 50% or more of children with special needs do not benefit from research-backed phonological awareness programs. Such students have been described in the research as treatment resisters and non-responders (McMaster et al. 2005). The results of Allor, Fuchs & Mathes (2001) substantiate the claim that students with difficulties beyond phonological delay may not respond to phonological awareness training. Torgesen, Wagner and Rashotte (1997) concluded that there is limited knowledge about how to effectively remediate the more severe forms of developmental reading disability and how to help these children become independent and fluent readers. It is clear that the process of reading is complex and multifaceted, so phonological awareness may not be the single strongest predictor and therefore should not be the sole focus of intervention in reading disabilities (Torgesen, Wagner & Rashotte 1994).

Most prevalent are studies that involve a repeated reading component (Rashotte & Torgesen, 1985; Dowhower, 1987; Sindelar, Monda & O’Shea, 1990; Mercer, Campbell, Miller, Mercer & Lane 2000; Kuhn & Stahl, 2003; Chard, Vaughn & Tyler 2002). In addition, interest in the effectiveness of strategies instruction is also gaining momentum. (Palinscar & Brown, 1984; Pressley, 1992; Wong, 1994; Butler, 1995; Loranger, 1997; Wong, et al., 2003; Manset-Williamson & Nelson 2005).
Repeated Reading

Repeated reading is not a new technique. Rashotte and Torgesen (1985) compared two different repeated reading conditions in order to determine: 1) whether improved fluency and comprehension were dependent on the degree of word overlap (words shared among passages to be read) and 2) whether repeated reading is more effective than the same amount of non-repetitive reading. Participants were 12 learning disabled students in grades 2-5. Students were required to read a total of 44 100-word passages. In condition one, the stories used for repeated reading contained a degree of word overlap and in condition two, the stories, also used for repeated reading contained three times as many overlapping words. These two conditions were compared to a control condition (non-repetitive reading) where all students read the same number of passages as those in condition one and two, but only read each passage once. The authors concluded that gains in reading speed were affected by the degree of word overlap among stories however; word commonality amongst stories had less effect on error reduction or improvement in comprehension. Reading speed comparisons between repeated reading and non-repetitive reading conditions revealed no significant differences.

Two years later, Dowhower (1987) designed a repeated reading experiment using 18 grade 2 students whose reading performance fit Chall’s (1996) Stage 2. The purpose of the study was to investigate the effect of assisted and unassisted repeated readings on rate, accuracy, comprehension and prosody. Results indicated that significant gains were made across all dependent measures for both treatment groups. No significant differences were reported between the two types of interventions.
Sindelar, Monda, and O’Shea (1990) compared the effectiveness of repeated reading for instructional versus mastery level readers. 25 learning disabled (LD) and 25 non-learning disabled (nonLD) students in grades 3-5 participated in the study. Students were grouped according to classification (LD or nonLD) and reading level (instructional or mastery) and instructed to read a passage once and then a different passage three times. Readings were timed for one minute and words per minute (wpm), errors per minute (epm), and ability to retell were measured for each passage read. Results showed that mastery level and instructional level readers benefited the same from repeated reading. Study findings suggest that repeated reading is equally effective for both LD and nonLD students.

Another repeated reading program targeting reading fluency was the Great Leaps Reading Program (Campbell, 1995). Mercer, Campbell, Miller, Mercer and Lane (2000) developed an experimental 3 group study to determine the success rate of the Great Leaps Reading Program that was designed to remediate the reading fluency skills of learning disabled students in grades 5-9. Each group received the treatment for a different time period (3 years, 2 years and 6-9 month intervention). The program featured one-to-one fluency-building activities such as phonics instruction, word identification, and repeated reading. The comparison of pretest/posttest results showed that all 3 groups improved their reading fluency skills significantly. Unfortunately outcome measures of reading comprehension were not included in the study, therefore whether the Great Leaps Reading program effectively increases children’s reading comprehension cannot be determined.
Reading fluency gained more attention from researchers after the publication of the National Reading Panel (NRP) report in 2000. One of the NRP criteria for studies to be included was that they examined the impact of repeated reading or some form of guided oral reading instruction on reading achievement. The NRP examined instructional literature addressing reading fluency and independent silent reading initiatives and found effect sizes of 0.55 on individual measures of reading accuracy and 0.44 on measures of reading fluency. An overall effect size of 0.41 was found for guided oral reading. The authors determined that guided repeated oral reading had a moderate impact on the reading achievement of students participating in the studies. One recommendation of the NRP was to implement guided repeated oral reading programs in classrooms (NICHD, 2000).

Two years later, in a synthesis of 24 studies on reading fluency interventions, Chard, Vaughn and Tyler (2002) found that reading rate, accuracy and comprehension of learning disabled students was improved through repeated reading interventions. Most importantly, the findings suggest that certain aspects of repeated reading interventions were more effective than others. Features such as teacher modeling, oral reading, repeated reading of familiar text with teacher feedback and set criteria for increasing text difficulty are vital components of a successful repeated reading program.

Research on fluency instruction was also the focus of a review by Kuhn and Stahl (2003). The authors intended to conduct a meta-analysis but were only able to find a few articles that included control groups yet found many baseline articles. Additional complications included the range of effect sizes (0.13-2.79) and the
variation of different treatment conditions. Their analysis included a total of 71 studies dealing with assisted reading, repeated reading, classroom reading fluency interventions and studies investigating segmenting of text and isolated word recognition. Thirty-one studies were included in their discussion of repeated reading and assisted reading. Of the 31 studies presented, 15 assessed the results of unassisted repeated reading programs. In most of the studies, the participants were required to re-read the passages three times. In six of the studies, repeated reading interventions produced significant improvement in reading achievement; eight studies had no effect and in one study, repeated reading improved fluency of familiar text but did not transfer to new, unrehearsed text. Overall, where there were gains in fluency, gains were also made in reading comprehension.

The other 16 studies reviewed by Kuhn and Stahl (2003) involved assisted reading. Assisted reading refers here to reading instruction that involves an adult working with a student in some capacity and included choral reading, reading-while listening, repeated reading and other modifications. In all cases, the participant was provided with a model of fluent reading. In Carbo (1978), Carbo (1981), and Chomsky (1978) taped books were used for students to listen to, read along with and practice repeated listening and repeated reading. Improvements in children's reading rate and accuracy were found in 7 out of 16 studies using assisted reading (Kuhn & Stahl, 2003).

Recently, Therrien (2004) successfully conducted a meta-analysis of experimental and quantitative intervention studies aimed at increasing reading fluency that addressed the following questions:
1. Is repeated reading effective in increasing reading fluency and comprehension?

2. What components within a repeated reading intervention are critical to the success of the program?

3. Do students with cognitive difficulties benefit from repeated reading?

Studies that measured transfer and/or non-transfer effects were included. Transfer was defined as the students' ability to make gains when reading new, unpracticed text after having repeatedly read a different text. Non-transfer measures assessed students' ability to fluently read or comprehend the same passage after repeatedly reading that text.

Findings indicated that students with and without learning disabilities benefit from repeated reading instruction. All students saw a moderate gain in fluency (LD ES=.77 and NLD ES=.76). A smaller mean effect size was seen for all students on comprehension measures (LD ES=.59 and NLD ES=.48). Effect sizes were based on differences between pretest and posttest scores.

Therrien's inclusion of studies that measured transfer effects is an important element to consider when designing any intervention study. In the case of reading fluency interventions, researchers may see gains in the reading rate and accuracy of a certain level of text or gains made using the same passage, but generalization may not occur when students are presented with new text. Researchers in the field of strategies instruction are well aware of the importance of transfer (Butler, 1998). As a result of the transfer problem, more longitudinal, sophisticated and effective strategy intervention
approaches have been developed (Butler, 1998, Pressley et al. 1992, Pressley et al., 1994). Often, the main goal of strategies intervention is to train participants to transfer their knowledge of strategies taught and become self-regulated learners. The goal is to improve the participant's ability to apply the appropriate strategy at the right time in the correct way. With this in mind, it seems important to include a strategies component in a reading fluency intervention. If students learn strategies to improve fluency, they may be more likely to use those strategies when they encounter new and more difficult text in the classroom.

2.4 Strategies Instruction

Research shows, (Pressley, 1992; Loranger, 1997) that the following are components of effective strategy instruction:

1. Strategies instruction occurs across curriculum.
2. Strategies are introduced to students through direct explanation and modelling.
3. Teachers discuss and model strategic behaviour by thinking aloud emphasizing to students that strategy use is a conscious process.
4. Teachers encourage students to understand that strategic behaviour is important to academic success.
5. Teachers motivate students to acquire strategies and use them in new situations.
6. Teachers emphasize and activate background knowledge during text processing in order to encourage students to contribute to the dialogue.
7. Gradually students are taught to activate background knowledge on their own.
8. Teachers encourage flexibility in applying and adapting strategies, as well as in interpreting text.
Cognitive strategy instruction enhances student learning, produces effective learners and is a means for helping students acquire knowledge and become self-regulated learners (Wong, 1994). “Cognitive strategies are cognitive processes that the learner intentionally performs to influence learning and cognition” (Wong, et al., 2003, pp.383). According to several researchers, effective strategy instruction involves teaching the strategy in context, informing students of the strategy to be used, how to use it and when (Butler, 1995, Palinscar & Brown, 1984).

Fostering self-regulation is the main goal of strategy instruction (Butler, 1995). Self-regulated learners analyze the task, then set task-specific goals and monitor their progress toward the goals (Butler, 1998). In Butler (1998), findings from three studies investigating the effectiveness of strategic content learning (SCL) to promote self-regulation were reported. SCL is an approach that was designed to promote strategic learning for students with learning disabilities rather than having a specific list of strategies for teachers to prescribe (Wong et al, 2003; Butler, 1995). SCL promotes students' development of self-regulation and metacognition and addresses the problems other approaches have with transfer of knowledge (Butler, 1998). In simple terms, the focus of instruction is to: 1) help students to identify goals based on the nature of a task and the students' specific problems with the task, 2) find approaches to attain the goals, 3) monitor the effectiveness of the strategies chosen, 4) modify approaches accordingly (Butler, 1995). In the first study, two university students were trained by the researcher and then all three tutored 13 college and university students with learning disabilities in the SCL approach. The participants were required to learn and apply the SCL techniques when studying their coursework. The other two studies investigated
the effectiveness of SCL for college students with learning disabilities. Over two years, a total of 21 college students participated. Each student received support for one year. Pre/post assessment included measures of the following: active strategy development and transfer, metacognition, self-efficacy and task performance. 87% of the students made gains in task performance. Students' metacognitive knowledge about tasks, strategies and monitoring improved between pre and posttest.

Although SCL has been shown to be an effective approach for adult post-secondary students with learning disabilities, there are components to SCL, like strategies being individually tailored, that suggest that SCL may be beneficial for younger students with learning difficulties.

Most recently, Manset-Williamson & Nelson (2005) conducted a comparative study of two strategic reading interventions aimed at improving decoding, fluency and reading comprehension for students in grades four to eight. Two multidimensional reading programs were provided one to one, for six weeks. The programs offered the same phonemic awareness and reading fluency instruction and differed only in the delivery of reading comprehension training. One group received guided reading instruction where strategies for improving reading comprehension skills were merely introduced in the hopes that self-regulation of these strategies would later occur. The other group received explicit strategies training in goal setting, progress monitoring and self-regulation. On measures of word attack and reading fluency there were no differences in gains between groups. However, participants in the explicit strategies group made significant gains over the students in the guided reading group on the oral retelling
measure of reading comprehension. The overall result was that a balanced strategic reading approach is effective for students with learning disabilities regardless of whether the strategies are implicit or explicit.

2.5 Summary

Existing research shows (Mercer et al., 2000; Therrien, 2004) that repeated reading is an effective method for improving reading rate and accuracy. A simple rereading intervention that includes reading text independently, reading the same passage again at a faster rate with an adult, and then reading it again alone as fluently as possible has been shown to be an effective procedure for improving reading fluency of students with reading disabilities (Wong, Harris & Bultler, 2003). Researchers have found that exposure to and direct instruction and modeling of strategies are effective means of providing strategies and promoting self-regulation for students with learning difficulties. These are students who would otherwise not be inclined to or aware that strategies can be used to enhance learning (Manset-Williamson & Nelson 2005; Butler, 1998).

The study reported herein was designed to compare the impact a combination of repeated reading and strategies instruction would have over repeated reading practice alone.

In addition to determining an effective method for improving oral reading fluency for struggling readers, it was of interest to investigate the suspected correlation between reading fluency and comprehension. If gains were made in reading fluency would reading comprehension also improve?
CHAPTER 3

Method

3.1 Research Design

A quasi-experimental design was used in this study. Participants matched on age and verbal ability were divided into two intervention groups. One group, the Strategies group (Strategies), received an intervention that included: repeated reading, strategy instruction and phonemic awareness training. Children in the Strategies group were encouraged to reflect upon the reading process. The second group or Repeated Reading (RR) group engaged only in repeated reading and phonemic awareness training. Outcome measures included curriculum based estimates of children's gains in reading fluency over time and experimental pre-post measures of oral reading fluency and reading comprehension.

3.2 Participants

A volunteer sample was selected consisting of children who attended a summer reading program at a university in the lower mainland of British Columbia. Children were referred to this reading program by their teachers and/or parents. All children in the study sample were included on the basis that:
• they were all proficient in the English language,

• their ages all fell in the range of 8 to 10 years,

• they were all referred by their teachers or parents as children with learning difficulties,

• their performance on the Woodcock Johnson III Tests of Achievement (Woodcock, McGrew, & Mather, 2001) fell at or below the 35%tile on broad reading scores, and

• they were not attending another summer reading program.

Prior to registration in the program children were tested on measures of reading and verbal ability. Children were tested one on one by a certified teacher who was also a graduate student in Education. Screening testing took place in a quiet room and took approximately 45 minutes.

3.3 Measures

Screening Measures


The following subtests from the Woodcock Johnson III Tests of Achievement were administered. According to the WJ III technical manual, internal consistency and test-retest reliability of the WJ III subtests were .80 or higher.

WJ III Letter Word Identification. Children’s ability to orally read written words presented in isolation was evaluated. The total score was calculated as the number of words read accurately.
**WJ III Reading Fluency.** During this task, participants read as many sentences as they could in three minutes. The score on this subtest was determined by the number of sentences read without errors during the 3 minute time period.

**WJ III Passage Comprehension.** This subtest is a cloze activity where children were asked to read a sentence or passage and orally, provide a word or phrase that was missing in a sentence.

**WJ III Word Attack.** On this subtest, children were presented with nonsense words in print and asked to read them aloud. The total score was calculated as the number of nonsense words accurately read.

**Stanford-Binet Intelligence Scale, 4th Edition.** (SB4; Thorndike, Hagen & Sattler, 1986).

**Stanford-Binet Vocabulary.** This test was administered to match children on verbal ability. Examinees were provided with a spoken word and were required to orally define words. Reliability estimates for the SB4 VIQ, range from .95 to .98.

**Comprehensive Test of Phonological Processing.** (Wagner, Torgesen, & Rashotte, 1999). The Comprehensive Test of Phonological Processing (CTOPP) is a standardized measure that assesses phonological awareness, phonological memory, and rapid naming. The rapid naming tests measure the children's efficient retrieval of phonological information from long-term memory, as well as their ability to execute a sequence of operations quickly and repeatedly. Reliability over time was estimated by the test-retest method, and ranged from .70 to .97 for individual subtests.
Rapid Digit Naming. Examinees were required to name non-sequential single digits listed in horizontal rows from left to right as quickly and accurately as possible. The number of errors and time taken to name the array were measured.

CTOPP Rapid Letter Naming. This subtest required children to name random, upper case letters in horizontal rows from left to right as quickly as possible. The number of errors and time taken to name the array were measured.

CTOPP Elision. This subtest measured children's ability to listen to a word and delete a phoneme from the beginning, middle, or end of the word to make a new word. For example, the student was asked to say the word 'popcorn' and then asked to say the word 'popcorn' without saying 'pop'.

CTOPP Non-Word Repetition. Examinees were asked to repeat a nonsense word that the examiner provided orally. The total score on this task was the number of words accurately repeated.

Curriculum Based Measures

Individual Reading Scores

Individual reading fluency gain scores were collected from 18 children who read the same five reading passages from the Great Leaps Reading Program (Campbell, 1995). The first 100 words from each story were used to obtain a grade equivalent level using the Flesh Kincaid readability scale.

Table 1 lists the story titles, grade equivalent level and the order the stories were read over the three week intervention.
Table 1 Great Leaps Reading Passages

<table>
<thead>
<tr>
<th>Title</th>
<th>Grade Equivalent</th>
<th>Order Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kate's Fish Camp</td>
<td>2.3</td>
<td>1</td>
</tr>
<tr>
<td>My Family</td>
<td>1.6</td>
<td>2</td>
</tr>
<tr>
<td>My Grandpa</td>
<td>4.4</td>
<td>3</td>
</tr>
<tr>
<td>Duck and the Train</td>
<td>1.9</td>
<td>4</td>
</tr>
<tr>
<td>Ode to Pizza</td>
<td>1.2</td>
<td>5</td>
</tr>
</tbody>
</table>

Two measures of reading fluency were obtained for each story read under two conditions (unpracticed and practiced): 1) total words read/minute (WPM) 2) total words read correctly/minute (WCPM).

Children read each story once and were timed for one minute. Words per minute and errors for each child participant were recorded on an individual graph. Next, children were given the opportunity to repeatedly read the passage both assisted and unassisted. After practicing, they read the passage again. The children's rate of reading in words read per minute and their reading errors were graphed.

Generalization Measures

Comprehensive Reading Assessment Battery (C.R.A.B.) (Fuchs, Fuchs & Hamlett, 1989)
The C.R.A.B. was used as a measure of word fluency, text fluency and reading comprehension. Form A was used pre-test and Form B was used post-test. The Flesh Kincaid readability scale was used to determine grade levels for each passage Form A= G.E. 2.8 and Form B= G.E. 3.0.

This test required children to first read aloud from one folktale for three minutes. Examiners marked insertions, omissions, mispronunciations, substitutions and repetitions. Self-corrections were not considered errors. The reading errors were subtracted from the total words read in three minutes; this number was divided by three to obtain the words per minute score. Children’s answers to the comprehension questions were scribed by the examiner.

Next students were given a randomized list of words to read in one minute. Words were generated from the story read. Words per minute scores were calculated by subtracting their errors from the total number of words read. The same procedure was used for the post-testing using Form B as a transfer measure three weeks later.

**Reading Materials**

Daily reading passages were selected from the Great Leaps Reading Program (Campbell, 1995). Both the instructor and the student had a copy of the text.

**3.4 Procedures**

**General Overview**

Fifty-seven child participants were assigned to intervention and control groups using a stratified random procedure based on age
and verbal ability. The groups were: Strategies (S, n=20), Repeated reading (RR, n=20) and Control group (CA matched control, n=17). All children in the intervention and control groups received reading instruction daily (Monday to Friday) over 3 weeks (15 sessions); each session lasted one hour for a total of 15 hours instruction.

The interventions were administered by two qualified teachers (certified by the British Columbia College of Teachers). An undergraduate Education student was assigned to each group to work as a research assistant to help with timed reading, graphing children’s results and teaching phonemic awareness lessons. To control for variation in outcomes due to teacher effects, the instructional sessions were counterbalanced across teachers.

Prior to and at the conclusion of the intervention program, each child was administered several measures of reading by research assistants. Each session took approximately ten minutes. All sessions were tape-recorded.

**Intervention Groups**

**Strategies Group**

The intervention for the strategies group in this study was designed to improve reading fluency using three components: phonemic awareness training, repeated/timed reading and strategies instruction.

**Phonemic Awareness/Phonics Training**

Daily group lessons involved introducing vowel digraphs and consonant digraphs (ey, ai, a_e, eigh, oi, oy, oa, oo, tion, ar, er, or,
The sounds to be studied that day were written on the chalkboard. The sounds were modeled and children were encouraged to repeat the sounds. The way the mouth is shaped to form the sounds was discussed. Word games were then played using nonsense and real words containing the sound taught that day. After the group lesson, children then began to work on repeated reading of passages. When they were finished with the repeated reading they engaged in word games to enhance their orthographic knowledge. Games like: “Hangman” using nonsense words, Boggle, phoneme concentration and word making using letter dice were played.

Repeated/Timed Reading

Children took part in daily timed and repeated reading activities with opportunities to self-reflect on their reading performance. Group instruction and one-to-one instruction occurred. During the one-to-one sessions, children were tape recorded and timed for one minute while reading an unpracticed 100-200 word passage from the Great Leaps Reading Program (Campbell, 1995). After practicing the passage approximately three times, independently and with an adult, the children were timed again. The number of words read per minute and number of errors made were graphed.

Error Analysis/Self-Reflection

Tape recordings provided an opportunity for children to listen to themselves read, conduct an error analysis and discuss ways to reduce the number of errors made and to self-reflect on the types of errors they were making. Individual student needs were identified by the instructor and/or the child. After listening to a recording of themselves reading, a dialogue between the instructor and child
ensued to determine errors made and discuss ways to overcome them. A typical dialogue:

_Instructor:_ What did you notice about your reading that time?

_Child:_ I noticed that I was trying to rush and made some silly mistakes.

_Instructor:_ What can you do the next time you read to make sure that doesn’t happen?

The child would have to draw on their metacognitive skills to come up with an appropriate strategy to apply.

_Child:_ “If I use my finger to track the words as I read, that might slow me down enough not to make silly mistakes with words that I know, but still allow me to read fast enough to reach my words per minute goal.”

“Touching the text with the finger” strategy would not be appropriate for a student who read very slowly and was accurate in decoding and word identification. For that child, the strategy may be to read along with the instructor and for the instructor to model appropriate pace. Participants in the study were ages 8-10 years and therefore needed a lot of adult guidance. For many of these struggling readers, using reading strategies was not something they were used to or particularly skilled at doing.

**Strategies Instruction/Goal Setting**

Participants in the Strategies group were individually taught strategies to improve reading speed, accuracy and prosody. The
individual coaching sessions ended with children setting a word per minute goal to reach during the next day’s timed reading test. With strategies in mind and goals set, the child was then instructed to read the same passage repeatedly both independently and with an adult modeling fluent reading of the passage.

Children were encouraged to reflect upon their use of: 1) phrasing, expression and prosody, 2) word attack skills 3) correction of errors such as repetitions, substitutions, omissions, additions 5) goal setting 6) their finger to track and reduce reading rate

As shown in Table 2, approximately 50% of the session was allocated to phonemic awareness/phonics activities and 50% of the time was spent on repeated/timed reading.

Table 2  Typical One Hour Session –Strategies Group (S)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00am-9:15am</td>
<td>-direct instruction of phonemes ai, a_e, eigh, ay&lt;br&gt;-word games using words/ nonwords with phonemes taught</td>
</tr>
<tr>
<td>9:15am-9:30am</td>
<td>-one by one children timed for one minute reading text at instructional level to one of the instructors&lt;br&gt;-tape recorded&lt;br&gt;-child listens to tape&lt;br&gt;-discuss types of errors made ways to improve and strategies to use to increase time and accuracy&lt;br&gt;-error analysis documented&lt;br&gt;-words per minute and number of errors made are graphed, teacher provides feedback on children’s performance that day&lt;br&gt;-student is given opportunity to discuss strategies they may use when they are timed on the same passage later in the session</td>
</tr>
<tr>
<td>9:30am-9:45am</td>
<td>-children practice reading same passage with adult, and on their own approximately 3 times</td>
</tr>
<tr>
<td>9:45am-10:00am</td>
<td>-group meets to review fluency strategies, play word games, reading fluency games and review phonemes taught</td>
</tr>
</tbody>
</table>
Repeated Reading (RR)

The components of the RR intervention included: phonemic awareness training and repeated/timed reading.

Phonemic Awareness Training

Participants in RR were provided with the same daily phonemic awareness lessons as Strategies group members.

Repeated/Timed Reading

Children in the RR group were provided with the opportunity to engage in daily timed and repeated reading activities. Like the Strategies group, RR participants were given 100-200 word passages to read from the Great Leaps Reading Program (Campbell, 1995). They were timed for one minute; results graphed and were instructed to repeatedly read the passage independently and with an adult. Once they read the same passage approximately three times, they were timed again and their results were graphed. Their daily timed readings were not tape recorded and opportunities for self-reflection or goal setting were not provided. Children in the repeated reading group did not conduct an error analysis and were not coached to reflect on their performance or provided with strategies to improve speed, accuracy or prosody. An instructor was available to read with the student or listen to the student read, but was not permitted to provide modeling of fluent reading. The role of the adult in this group was to ensure that each child who read a passage was timed, and that he/she practiced the passage by repeatedly reading the text silently or orally at least three times and then timed again. No instruction for improvement or discussion of the child’s progress occurred in this group. This group was
merely given the opportunity to be timed and engage in repeated readings both independently and with an adult.

As shown in Table 3, 50% of the time was allocated to phonemic awareness activities and 50% of each session was spent on repeated/timed reading. Notably, the amounts of time devoted to phonemic awareness were the same in both the Strategies and Repeated Reading groups.

Table 3  Typical One Hour Session –Repeated reading (RR)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00am</td>
<td>-direct instruction of phonemes for e.g., ai, a_e, eigh, ay</td>
</tr>
<tr>
<td>9:15am</td>
<td>-word games using words/ nonwords with phonemes taught</td>
</tr>
<tr>
<td></td>
<td>-one by one children timed for one minute reading text at their approximate instructional level to one of the instructors</td>
</tr>
<tr>
<td></td>
<td>-words per minute and number of errors are graphed and not discussed</td>
</tr>
<tr>
<td>9:15am</td>
<td>-child reads passage again with adult and twice more on their own</td>
</tr>
<tr>
<td>9:45am</td>
<td>-child is timed reading the same passage again</td>
</tr>
<tr>
<td></td>
<td>-results graphed</td>
</tr>
<tr>
<td>9:45am</td>
<td>-group meets for more word games, review of phonemes and</td>
</tr>
<tr>
<td>10:00am</td>
<td>reading fluency games</td>
</tr>
</tbody>
</table>

Control Group

Of the 57 participants chosen, 17 chronological-age controls received daily, individualized tutoring from an undergraduate student enrolled in the teacher education program in the Faculty of Education. Sessions were one hour, five days per week for three
weeks. Lessons were individualized to address areas of weakness in reading for each child. Activities to develop reading skills were used and included: phonemic awareness/phonics training and comprehension strategies training.

Social Validity

A questionnaire was completed by participants on the second to last day of the study and was administered as a group activity. An adult read each statement and response choices to the children. Children were told not to put their name on the questionnaire to encourage honesty and reduce anxiety when responding. Instructions and statements were repeated if requested.

Thirty-six children completed the questionnaire which consisted of 14 statements. Twelve statements required children to circle one of the following responses: "Yes", "No", "Sometimes", "Don't Know". Two statements required students to complete the following sentences: 1) "My favourite activity at camp was_______________" 2) "I would like you to know that__________________".
CHAPTER 4

Results

4.1 Participants

The descriptive statistics, means and standard deviations for the fifty-seven children participating in the study are shown in Table 4. The data were submitted to a multivariate analysis of variance (MANOVA SPSS version 13.0) to check that groups were closely matched in age, reading fluency (WJ III reading fluency) and verbal ability (Stanford Binet: Vocabulary). The MANOVA that compared groups on age corrected standardized scores on measures of reading fluency and verbal ability was not significant, Wilks' Lambda = .96, \( F(4, 106) = .61, p > .05 \). Mean group performances on these selection measures were statistically equivalent.

<table>
<thead>
<tr>
<th></th>
<th>Strategies (n=20)</th>
<th>Repeated Reading (n=20)</th>
<th>Control (n=17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Months</td>
<td>114.70 8.73</td>
<td>111.15 9.75</td>
<td>107.94 10.26</td>
</tr>
<tr>
<td>SB Vocabulary</td>
<td>99.70 8.46</td>
<td>96.40 11.54</td>
<td>101.65 10.75</td>
</tr>
<tr>
<td>WJ III Reading Fluency</td>
<td>90.85 10.08</td>
<td>91.15 9.97</td>
<td>91.00 25.26</td>
</tr>
</tbody>
</table>

*p<.05
Although children in the study were matched on age and reading fluency/verbal ability, children varied in their ability to read the leveled texts within the Great Leaps Program. According to the publishers of The Great Leaps Program the series of stories within each level of the program increase in difficulty for children in the age-range represented in this study. The readability of each passage in The Great Leaps Reading Program varied from grade 1.2 (Ode to Pizza) to grade 4.4 (My Grandpa); however, stories did not progress in difficulty as suggested by the program publishers.

To correct for this variation in readability and to allow for comparisons of reading fluency scores from one story to the next for each child, a corrected fluency score was obtained by weighting the WCPM (words correct per minute) score by the Flesch Kincaid grade-equivalent estimate. For example, if a student read 80 total words in one minute and made 5 errors while reading Kate's Fish Camp (GE. 2.3) the weighted, corrected fluency score would be \((80-5) / 2.3 = 33\).

4.2 Intervention Outcomes

It was important to determine whether children in the intervention groups made treatment gains over time. Eighteen children in the sample (strategies group, n=9 and repeated reading group, n=9) read the same 5 stories over the course of the study. The MANOVA that compared children on reading fluency and verbal ability was not significant. Wilks' Lambda = .87, F (2,15) = .36, p > .05.
Several analyses were conducted. First, performance differences between the Repeated Reading and Strategy groups on the five stories were compared at baseline, (i.e., on the unpracticed condition) using a repeated measures ANOVA on WCPM scores. A group x story interaction was found, Wilks’ Lambda = .58, F (4, 13) = 2.28, p > .05. Groups, on average, performed the same at baseline on all five stories.

A repeated measures ANOVA on the WCPM scores on each story after practicing showed no significant group differences; Wilk’s Lambda = .58, F (4, 13) = 2.31, p > .05. The interaction between groups and story approached, but did not reach statistical significance, F (4, 64) = 1.44, p < .08. Within group individual differences also approached, but did not reach statistical significance, F (4, 64) = 1.64, p < .09. When the analysis was repeated with weighted WCPM scores (i.e., correcting for variance due to readability of passages), average group performances on the individual stories increased over time: Wilks’ Lambda = .04, F (4, 13) = 71.85, p < .01; however, the group x story interaction was not significant, F (4, 13) = .84, p > .05.

Taken together, the results of this analysis suggest that reading fluency, as indicated by a words correct per minute score, of children in both the Repeated Reading and the Strategies group increased over time; however, there were no differences between groups in reading outcomes.

To further evaluate within group, individual effects, a profile analysis comparing individual children’s performance on the WCPM measure under unpracticed and practiced conditions on the five stories was conducted. See Table 5 for mean words correct per
minute scores of both unpracticed and practiced passages for each of the five stories.

Table 5  Mean WCPM Scores on Unpracticed and Practiced Readings

<table>
<thead>
<tr>
<th>Story</th>
<th>Unpracticed M</th>
<th>Unpracticed SD</th>
<th>Practiced M</th>
<th>Practiced SD</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kate's</td>
<td>69.72</td>
<td>20.02</td>
<td>98.72</td>
<td>24.21</td>
<td>47.69</td>
</tr>
<tr>
<td>Family</td>
<td>67.06</td>
<td>24.30</td>
<td>89.89</td>
<td>24.63</td>
<td>52.76</td>
</tr>
<tr>
<td>Grandpa</td>
<td>67.72</td>
<td>18.43</td>
<td>92.22</td>
<td>24.19</td>
<td>97.82</td>
</tr>
<tr>
<td>Duck &amp;</td>
<td>73.89</td>
<td>27.84</td>
<td>99.00</td>
<td>29.43</td>
<td>62.25</td>
</tr>
<tr>
<td>Train</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pizza</td>
<td>79.22</td>
<td>25.59</td>
<td>98.22</td>
<td>26.20</td>
<td>19.85</td>
</tr>
</tbody>
</table>

*p<.05

WCPM = Words per minute were calculated through one-minute timed readings. Errors were subtracted from total number of words read.

As shown in Figures 1-5, considerable variation in individual differences in performance within groups were found. Not all children made equal gains from baseline (unpracticed) to the practiced condition. Mean words correct per minute scores for practiced readings both weighted and unweighted for text difficulty are presented in Tables 6 and 7.
Figure 1  Story One Individual Gains

Kate’s Fish Camp

Strategies  Repeated Reading

Words Correct Per Minute

A B C D E F G H I J K L M N O P Q R

time

1

2
Figure 2  Story Two Individual Gains

![Graph showing individual gains over time for strategies and repeated reading.](image)
Figure 3  Story Three Individual Gains

Grandpa

Words Correct Per Minute

Strategies  Repeated Reading

20 40 60 80 100 120

A B C D E F G H I J K L M N O P Q R

time 1 2

43
Figure 4  Story Four Individual Gains

Duck & Train

![Graph showing words correct per minute over time for Strategies and Repeated Reading.

Strategies
Repeated Reading

Words Correct Per Minute

A B C D E F G H I J K L M N O P Q R

Time
1
2
Table 6 Weighted Words Correct Per Minute Reading Fluency Scores (Practiced)

<table>
<thead>
<tr>
<th>Group</th>
<th>Kate's M SD</th>
<th>Family M SD</th>
<th>Grandpa M SD</th>
<th>Duck &amp; Train M SD</th>
<th>Pizza M SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategies</td>
<td>44.83 10.84</td>
<td>56.53 15.37</td>
<td>21.64 4.49</td>
<td>49.77 13.09</td>
<td>78.61 20.03</td>
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<tr>
<td>Repeated Reading</td>
<td>41.01 10.47</td>
<td>55.83 16.34</td>
<td>20.28 6.56</td>
<td>54.44 18.06</td>
<td>85.09 24.24</td>
</tr>
</tbody>
</table>

Mean words correct per minute scores were obtained through one minute timed readings of a practised passage. Errors were subtracted from total words read. Total correct words per minute were divided by text difficulty for a words correct per minute weighted by text difficulty score.
Table 7 Unweighted Words Correct Per Minute Reading Fluency Scores (Practiced)

<table>
<thead>
<tr>
<th>Group</th>
<th>Kate's M</th>
<th>SD</th>
<th>Family M</th>
<th>SD</th>
<th>Grandpa M</th>
<th>SD</th>
<th>Duck &amp; Train M</th>
<th>SD</th>
<th>Pizza M</th>
<th>SD</th>
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<tr>
<td>Strategies</td>
<td>103.11</td>
<td>24.95</td>
<td>90.44</td>
<td>24.59</td>
<td>95.22</td>
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<td>94.56</td>
<td>24.88</td>
<td>94.33</td>
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<tr>
<td>Repeated Reading</td>
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<td>24.09</td>
<td>89.33</td>
<td>26.14</td>
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<td>28.86</td>
<td>103.44</td>
<td>34.31</td>
<td>102.11</td>
<td>29.09</td>
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</table>

Mean words per minute scores were obtained through one minute timed readings of a practiced passage. Errors were subtracted from total words read for a words correct per minute score.

Reading Fluency and Reading Comprehension - Generalization

Next, it was of interest to compare whether gains in word reading fluency and reading comprehension were equal among the Strategies, Repeated Reading and the Control group. A repeated measures analysis of variance was performed on the pre and post-test performance on C.R.A.B. measures of word fluency, text fluency and reading comprehension. For all three variables, two effects were tested: time main effect (pretest vs. posttest) and time-by-group interaction effect. The assumption of equal variances among groups was tested using the Levene’s test and the assumption was met. Table 8 shows the pre and posttest means and standard deviations by intervention group for all C.R.A.B. variables using raw scores.
Table 8  Pre/Posttest Means and Standard Deviations

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<tr>
<th>Measure</th>
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<th>n</th>
<th>Pretest M</th>
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<td>Total</td>
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<td>58.37</td>
<td>22.66</td>
<td>25.93</td>
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<tr>
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<td>Strategies</td>
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<td></td>
<td>Reading</td>
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<td>Total</td>
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<td>68.72</td>
<td>65.54</td>
<td>33.18</td>
<td>31.57</td>
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<td>4.82</td>
<td>2.90</td>
<td>2.53</td>
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<tr>
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<td>Total</td>
<td>57</td>
<td>4.23</td>
<td>3.79</td>
<td>2.66</td>
<td>2.19</td>
</tr>
</tbody>
</table>

Scores obtained from C.R.A.B.

No statistically significant time or time by group interaction effects were observed for any of the measured variables (Wilks' Lambda was used). Eta squared was employed to describe the effect size. The time effect $F(2,53)=.00, p=.99, \eta^2=.00$ and for time by group $F(4,106)=.76, p=.55, \eta^2=.03$.

A univariate analysis of variance (SPSS version 13.0) was also performed to compare all three groups on reading comprehension, text fluency and word fluency. The Levene's tests concluded that the assumption of equal variances was met across groups for the posttests for comprehension $p=.06$ and text fluency $p=.11$ but the assumption was not met for the word fluency posttest at $p<.05$. The group effect for word fluency was not significant $F(2, 56) =2.79$, $p=.10$. 

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Social Validity

Overall, participants in both intervention groups responded favourably to the programs as measured by the social validity questionnaire.

In response to the statement, "I had fun at reading camp", 28 (78%) responded “Yes”, 8 (22%) responded “Sometimes”, 0 responded “No”. When asked if they thought their reading skills had improved 27 (75%) responded “Yes”, 8 (22%) responded “Don’t Know” and 1 (2.8%) responded “No”. 17 (47%) respondents finished the statement “I would like you to know that_________” with “I had fun” or “I had a great time”.

4.3 Summary

In summary, the results show that on average, children in both intervention groups made gains on the curriculum based measures over time, however, group differences in performance were not statistically discrepant from each other or from the control group that received one-to-one instruction to improve general reading skills. Moreover, the improved performance on curriculum based measures of children in the treatment groups did not translate to improved performance on the C.R.A.B. outcome measures of reading fluency or reading comprehension.
The main goal of this study was to evaluate the efficacy of two interventions designed to increase children's reading fluency and to determine whether improvement in reading fluency as a result of intervention also impacted reading comprehension. It was anticipated that when children are encouraged to self-reflect upon reading fluency strategies that they use, improvements found both in reading fluency and reading comprehension skills would be greater than those found when children were taught to increase reading fluency through practice alone. These improvements were expected because children in the Strategies group were expected to be more self-reflective regarding the strategies that they use to gain meaning from text. It was anticipated that the additional strategies instruction children in the Strategies group were exposed to would make them more metacognitively aware of the reading process and improve their reading fluency rate and accuracy to a level that would allow them to attend more closely to the meaning of the text.

The findings showed, however, that group means on measures of reading fluency were not statistically different. Children in both the RR and the Strategies groups made gains in reading fluency over time. Importantly, however, these differences did not translate into
gains in reading comprehension. A strategies component did not result in improved reading fluency compared to engagement in repeated reading alone. The results of this study suggest that guided repeated reading practice is sufficient for improving reading fluency rate and accuracy.

The finding that children in the Strategies group did not make greater gains than the Repeated Reading group requires further explanation. Research has shown that struggling readers do not use metacognitive strategies easily (Manset-Williamson & Nelson 2005; Butler, 1998); therefore it is possible that focusing on the strategies to improve reading fluency actually interfered with children’s ability to attend to the meaning of text. Children may have found that dividing their attention between strategies to improve reading fluency and strategies to understand what they had read taxed the cognitive resources available and resulted in a cost to overall comprehension. Second, the study length of only 3 weeks duration may have been too short to realize treatment effects. It would be interesting to conduct a similar study over a longer period of time to determine if increasing the children’s ability to use specific strategies has implications over the long term that are not realized in the short term. Notably, a large proportion of time in the Strategies group was spent modelling strategies to students and instructing them in error analysis; it is possible with more independent practice, the intervention would be strengthened.

The finding that reading comprehension was not improved with gains in reading fluency is consistent with findings from a meta-analysis of 31 studies of reading fluency interventions conducted by Kuhn & Stahl (2003). The authors reported that of the 10 studies that employed samples of intermediate aged children, only 4
investigations reported gains in reading comprehension; whereas studies that used samples of older children found greater treatment effects. Interventions to improve reading fluency may be of greater benefit to reading comprehension for older adolescents than for children in the upper elementary grades.

5.1 Implications for Teaching Practice

For some children, mastery of the reading process is slow to develop. By the time poor readers enter the intermediate grades, many of their same-age peers have become proficient readers (Fuchs & Fuchs, 2005). According to Mercer et al (2000) by fourth grade 20% of children are dysfunctional readers and approximately 75% of poor readers in grade three continue to be poor readers in grade nine. It is important for intermediate teachers to understand that struggling readers in their classes can benefit from instruction. Providing explicit and differentiated reading instruction to meet the needs of the diverse learners that exist in every intermediate classroom is essential.

Some of struggling readers are deficient in basic sight word identification skills, decoding and fluency as well as having difficulty with reading comprehension skills (Fletcher, Morris & Lyon, 2003). The problem teachers of intermediate grades face is how to include direct instruction of reading sub-skills for these struggling readers while at the same time meeting the needs of children who are proficient in reading sub skills and are ready to synthesize and analyze text. Differentiating instruction to address the wide range in text reading ability that exists among children in many intermediate
classes presents many challenges for teachers (Fuchs & Fuchs, 2005). Research has shown that approximately 40% of intermediate children with reading difficulties in inclusive classrooms make little progress in the reading process and are reading below a basic level of achievement (Mercer et al. 2000, O'Connor et al. 2002).

The findings from this study suggest that effective intervention to improve reading fluency need not be overly involved or time consuming. Incorporating repeated reading into an existing reading program can improve reading fluency for students in the early intermediate grades and the use of explicit strategies instruction may not be a necessary component of a reading fluency intervention to ensure positive outcomes. An repeated reading intervention that includes modeling of appropriate reading rate, accuracy and prosody may be sufficient to improve reading fluency. The cost of the repeated reading intervention on teacher time and resources is far less than would be required for the metacognitive strategy intervention. Notably, five of the six research assistants that were interviewed upon completion of the study felt the Strategies group intervention was labour intensive and time consuming compared to the workload required for the Repeated reading group. One research assistant commented, “It would be very difficult to facilitate the Strategies group intervention in a typical resource room with one teacher and a group of six students. You would need a minimum of two staff members in order to provide the instruction and the testing.” Another research assistant stated, “The Repeated reading intervention was easier to implement. The students seemed to be less bogged down thinking about the strategies use and seemed to have more opportunity to focus on repeatedly reading the passages.”
Further, findings from this study are consistent with previous research (e.g., Dowhower, 1994) that shows repeated reading as being, "...deceptively simple but extraordinarily powerful..." (p.343). Repeated reading is an effective reading fluency tool for daily use in elementary and secondary school programs and can be successfully delivered in two formats: 1) as a supplement to the classroom reading program or 2) as a separate program delivered outside of the general education classroom. Resource teachers can develop and implement individualized or small group reading fluency programs on a regular basis. In addition, parents, volunteers and support workers can be trained to implement repeated reading fluency programs for children to use at school or at home.

As discussed earlier, one of the reasons that struggling readers remain behind their peers may be due to their reluctance to practice reading. The less they practice the wider the gap in their reading ability compared to that of their capable peers. It is essential that the reading program or intervention that is presented to students is enjoyable and meaningful for them. Reduction of anxiety through reading games and documenting progress by graphing their successes can create reading experiences that are palatable to older learners with reading difficulties.

To conclude, the overall purpose of this study was to investigate the effectiveness of two intervention approaches to improve reading fluency for intermediate children. Although no clear advantage emerged for the repeated reading over the metacognitive strategy instruction; the study highlights the importance of continuing to address reading fluency problems in children beyond the primary grades.
Appendixes

Appendix A

Reading Fluency and Comprehension Study
July 4 – 22, 2005
Anecdotal Reports

Student Name: ____________________________
Personal Goal: _____ WPM _____ Errors

<table>
<thead>
<tr>
<th>Date</th>
<th>Reading Rate (WPM)</th>
<th>Error Rate</th>
<th>Anecdotal Report</th>
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## Appendix B

### Error Analysis

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<th>Type of Error Made</th>
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<td>Repetition</td>
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<tr>
<td>Skipped word (omission)</td>
</tr>
<tr>
<td>Added an extra word (insertion)</td>
</tr>
<tr>
<td>Mispresentation</td>
</tr>
<tr>
<td>Phrasing/intonation</td>
</tr>
<tr>
<td>No stop at punctuation</td>
</tr>
<tr>
<td>Pace too slow/uneven</td>
</tr>
<tr>
<td>Uneven Breathing</td>
</tr>
<tr>
<td>Too Quiet</td>
</tr>
<tr>
<td>No expression</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Total # of Errors</td>
</tr>
</tbody>
</table>

**self-corrections are not counted as errors**
Appendix C

Program Summary

Student, Class Size, and Duration of Study:
Male Student attended a reading fluency study for one hour, 5 days per week for 3 weeks, although he was absent one day in the first week. There were eight students in his group, ranging in age from 8-10 years, and two teachers.

Program Goals and Objectives:
The program goals were to increase reading fluency and accuracy. This included the identification of reading attitude as well as the reading strengths and weaknesses that need focus. The readings were from The Great Leaps Reading Program 4th Ed. (1998) by Kenneth U. Campbell, Diarmuid, Inc. Florida. Sub-skills taught included phoneme awareness, word identification, decoding, and syllabication. Instruction also included goal setting and repeated readings. To motivate students to reach their personal reading goals, they received positive reinforcement with verbal comments and small prizes; they also graphed their number of words read per minute and the number of errors made. The intervening activities provided were word families, speedy sentences, word board games, and nonsensical word games that combined phonemes and affixes.

Student's Reading Behaviour and Response to Intervention:
Your child displayed a positive attitude toward reading. Proficiency was evident in both his sight word vocabulary and in phonemic awareness. He was self-motivated and read expressively, exhibited variable intonation, and took pleasure in the challenge of meeting his personal reading goals. He attended well to punctuation and read at an appropriate rate. Repeated readings helped to increase his reading fluency. The specific activities that he enjoyed were "Hangman" and the word board game "Vowel Bingo". He showed that he is building confidence as a fluent reader.

Recommendations:
- Areas to focus on include dividing new multisyllabic words into syllabic and subsyllabic units.
- At home, daily reading of materials that interest him would help to increase fluency.
- Repeated readings of favoured materials would aid fluency.
Appendix D

Student Survey

Please answer the questions by putting a circle around your answer.

1. I had fun at reading camp.  
   YES  
   NO
2. I thought reading camp was boring.  
   YES  
   NO
3. I started liking reading because of reading camp.  
   YES  
   NO
4. I have always liked reading.  
   YES  
   NO
5. I liked the timed reading.  
   YES  
   NO
6. I liked the cold reading the best.  
   YES  
   NO
7. I liked the hot reading the best.  
   YES  
   NO
8. I liked reading by myself.  
   YES  
   NO
9. I liked reading to a teacher.  
   YES  
   NO
10. I met a new friend at this camp.  
    YES  
    NO
11. I think my reading improved.  
    YES  
    NO
12. I was at the reading camp last year.  
    YES  
    NO
13. My favourite activity at camp was ________________________________
14. I would like you to know that ________________________________
### Appendix E

#### Timed Readings—Strategies Group

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<th>Date</th>
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<th>Hot</th>
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Name: ___________________________ Personal Goal: ______ WPM ______
### Appendix F

**Timed Readings-Repeated Reading**

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