I, Maria Oddo, M.Ed.____________________________________, hereby submit this work as part of the requirements for the degree of:
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It is entitled:
Reciprocal Peer Tutoring Using Repeated Reading: A Systematic_______
Replication Using Small Groups of Students_____________________

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Reciprocal Peer Tutoring Using Repeated Reading:
A Systematic Replication Using Small Groups of Students

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Abstract

This study investigated the effects of small group peer-mediated repeated reading practice on reading fluency and comprehension for students at risk for reading failure. Previous research has investigated the efficacy of peer-mediated repeated reading interventions carried out by student dyads. This research extends the existing research by further investigating the impact of repeated reading on oral reading fluency and comprehension when carried out in a small group format with students in a fourth grade classroom. Results indicated that repeated reading practice in a small group format was effective in improving levels of reading fluency and reading comprehension skills of four targeted students, but there did not appear to be enough data to interpret trend (Christ, 2006). Evidence also indicated immediate class-wide changes in fluency and comprehension but these effects were diminished in follow-up. Acceptability ratings showed that the format was easy to implement and acceptable to stakeholders.
Reciprocal Peer Tutoring Using Repeated Reading:
A Systematic Replication Using Small Groups of Students

Reading is critical to success in today’s society. Students first learn to read and then read to learn. While some children readily learn to read, others need explicit reading instruction. Historically, there have been extensive federal efforts to improve the quality of education. In 2002, President Bush signed the *No Child Left Behind Act* (NCLB) into law. *NCLB* puts the focus on instruction and methods that have been proven to work (NCLB, 2002). An emphasis on research-based instruction has been proposed as a means of addressing academic problems for all children. The purpose of this study was to systematically replicate results of the effectiveness of peer-mediated repeated reading (RR) strategies by using small groups of students to tutor one another.

The National Reading Panel (NRP) provides an analysis of research-based strategies that have been found to be effective in improving reading achievement (National Institute of Child Health and Human Development, 2000; hereafter NICHD). A selected group of reading researchers identified five components as essential for effective reading instruction through a meta-analysis. The panel reported that phonemic awareness, phonics, fluency, vocabulary, and text comprehension are skills that must be explicitly taught in order for students to become successful readers (NICHD, 2000). The current study is concerned with fluency and comprehension.

Fluency entails the ability to read text accurately, rapidly, and with correct expression, and is an essential feature of competent reading (Allington, 1983). Comprehension involves the ability to relate reading material to one’s own knowledge in order to gain an understanding of the text. Many researchers believe that fluency and comprehension are highly related. For example,
Samuels (1979) proposed that there is a fundamental link between oral reading fluency and increased comprehension. He argued that students who can read text fluently without stopping to decode words can attend to comprehension more fully. Likewise, Grossen and Carnine (1991) offer that students who misidentify more than 5% of the words in textual material or read at a rate of less than 100 words per minute (for students at or above second grade) have decoding problems that will impede their comprehension of reading material. Although reading comprehension is recognized as essential to the reading process, fluency is an often overlooked part of reading instruction. According to Fuchs et al. (2001a), this may be due to the fact that fluency is often considered to result from other types of reading instruction and direct instruction in this area is not seen as necessary. However, the NRP (NICHD, 2000) found that nearly 44% of fourth-grade students do not read with fluency and that this contributes to problems with comprehension.

**Strategies to Improve Reading Fluency**

According to the NRP (NICHD, 2000), competent reading requires skills that extend beyond the single-word level to contextual reading, and this skill can best be acquired by practicing reading words in a meaningful context. Despite the variety of methods used to improve students’ fluency and comprehension skills, not all of these practices are equally effective. The NRP (NICHD, 2000) analyzed two widely used basic reading strategies: guided repeated oral reading and another approach in which the learner is simply encouraged to read more—as in sustained silent reading models (SSR). In their meta-analysis, the NRP (NICHD, 2000) found evidence to support guided repeated reading, but not for approaches such as SSR. More specifically, guided repeated oral reading is suggested by the NRP as one explicit strategy to improve oral reading fluency in struggling readers.
Samuels (1979) describes guided repeated oral reading as a strategy that consists of re-reading a short and meaningful passage until a satisfactory level of fluency is reached. The NRP (NICHD, 2000) explains that guided repeated oral reading techniques share several key features. First, most of these procedures require students to read and reread a text. This repeated reading usually is done a set number of times or until a pre-specified level of proficiency has been reached. Second, many of these procedures increase the amount of oral reading practice that is available through the use of a range of methods including one-to-one instruction, tutors, audiotapes, peer guidance, or other means. Third, some of the procedures have carefully designed feedback routines for guiding the reader’s performance. Overall, the NRP found that guided repeated oral reading instruction was effective and calculated a weighted (by the number of subjects in the study or comparison) effect size average of .41, suggesting that guided repeated oral reading has a moderate impact upon reading achievement (NICHD, 2000).

After analyzing guided repeated oral reading procedures, the NRP (NICHD, 2000) concluded that these procedures had a consistent and positive impact on fluency and comprehension as measured by a variety of test instruments and at a range of grade levels. Furthermore, the analysis of the NRP indicated that repeated reading procedures improve reading ability of students without reading impairments through at least grade 4, and those with reading problems throughout high school.

A literature review was conducted to further examine the research support for the repeated reading (RR) strategy. Research databases (ERIC, Academic Search Premiere, Primary Search, Professional Development Collection, and Psychology and Behavioral Sciences Collection) were searched (July, 2006) using the following keywords or phrases: repeated reading; repeated reading and intervention; peer-mediated repeated reading; peer-mediated
interventions; peer tutoring and reading and small groups; peer-mediated and reading and small groups; peer tutoring and repeated reading and small groups; peer tutoring and elementary and reading; peer tutoring; and peer-mediated and elementary. The following section further describes research support for repeated reading (RR) strategies.

In a meta-analysis, Therrien (2004) found that RR improved the reading fluency and comprehension of both students without disabilities and students described as learning disabled. Effect sizes were calculated (by the original author) for nontransfer measures (i.e., measures of students’ ability to fluently read or comprehend the same passage after reading it multiple times) and transfer measures (i.e., measures of students’ ability to fluently read or comprehend a new passage after having read dissimilar passages multiple times). Across all nontransfer measures, the mean fluency effect size (ES) increase was .83 and mean comprehension ES increase was .67. Across all transfer measures, mean fluency ES increase was .50 and mean comprehension ES increase was .25. Therrien (2004) also did a component analysis of RR and found that the following components were important for effective instructional strategies: adult implementation, cueing, three to four repetitions of text, corrective feedback, and use of a performance criterion.

As suggested above, early findings have suggested that RR increased students’ oral reading rate and comprehension (e.g. Dowhower, 1989; O’Shea, Sindelar, & O’Shea, 1987). More recently, Eckert, Ardoin, Daly, and Martens (2002) investigated the effects of RR methods, in which a student first listened to a fluent adult read (often referred to as listening passage preview) and then read a passage aloud three times (repeated reading), on students’ oral reading. They found that the use of these methods increased oral reading fluency (ORF) for all six elementary student participants, including two students with deficits in reading decoding and
comprehension. Specifically, students increased the number of words read correctly per minute on practiced passages during the instructional phase by a factor ranging from 1.3 to 2.4 over the baseline rates (e.g., rates increased from approximately 35 to 85 words per minute for one student). The results of this study are particularly interesting because the instructional strategy was conducted only twice a week for 15 minutes per session over an 8-week period.

In fact, many studies have found that RR results in increased fluency (e.g., Begeny & Martens, 2006; Begeny & Silber, 2006; Devault, & Joseph, 2004; Eckert, Ardoín, Daisey, & Scarola, 2000; Eckert, et al., 2002; Gardner, Cartledge, Seidl, Woolsey, Schley, & Utley, 2001; Gilbert, Williams, & McLaughlin, 1996; Green, Alderman, & Liechty, 2004; Kuhn, 2005; Layton & Koenig, 1998; Mercer, Campbell, Miller, Mercer, & Lane, 2000; Moskal, 2006; Nelson, Alber, & Gordy, 2004; Rashotte & Torgesen, 1985; Rasinski, 1990; Rose & Beattie, 1986; Sindelar, Monda, & O’Shea, 1990; Strong, Wehby, Falk, & Lane, 2004; Vaughn, et al., 2000; Weinstein & Cooke, 1992), comprehension (e.g. Freeland, Skinner, Jackson, McDaniel, & Smith, 2000; Krug, Davis, & Glover, 1990; Marchand-Martella, Martela, Orlob, & Ebey, 2000), or both fluency and comprehension (e.g. Denton, Fletcher, Anthony, & Francis, 2006; Dowhower, 1987; Fuchs, et al., 2001b; Fuchs & Fuchs, 2005; Hiebert, 2005; Homan, Klesius, & Hite, 1993; Levy, Abello, & Lysynchuk, 1997; Levy, Nicholls, Kohen, 1993; O’Shea, et al., 1985; Stoddard, Valcante, Sindelar, O’Shea, & Algozzine, 1993; Staubitz, Cartledge, & Yurick, 2005; Therrien, 2004; Therrien, Wickstrom & Jones, 2006; Valleley & Shriver, 2003; Yurick, Robinson, Cartledge, Lo, & Evans, 2006). Among these studies, RR methods take a variety of formats, such as (a) a direct instruction approach, in which students chorally read repeatedly or chorally read with the teacher’s oral reading and then repeatedly read a passage (i.e., Hiebert, 2005; Homan, et al., 1993; Kuhn, 2005; Strong, et al., 2004); (b) unassisted RR where the child
silently reads and rereads the same passage to himself/herself (i.e., Krug, et al., 1990; Levy, et al., 1993; Moskal, 2006); (c) taped previewing, in which students listen to a tape recording of a passage of text before reading along with or without the recording several times (i.e., Denton, et al., 2006; Dowhower, 1987; Gilbert, et al., 1996; Rose & Beattie, 1986; Weinstein & Cooke, 1992); (d) a peer-mediated approach, in which student dyads read a passage to one another for a predetermined number of repetitions or until a fluency criterion is met (i.e., Begeny & Martens, 2006; Begeny & Silber, 2006; Fuchs, et al., 2001a; Fuchs & Fuchs, 2005; Fuchs, Fuchs, Thompson, Svenson, Yen, Otaiba, et al., 2001; Gardner, et al., 2001; Green, et al. 2004; Homan, et al., 1993; Marchand-Martella, et al., 2000; Rasinski, 1990; Staubitz, et al.; Vaughn et. al., 2000; Yurick, et al., 2006); (e) assisted RR where the child reads aloud to and along with a fluent adult (i.e., Devault & Joseph, 2004; Eckert, et al., 2000; Eckert, et al., 2002; Freeland, et al., 2000; Layton & Koenig, 1998; Mercer, et al., 2000; Nelson, et al., 2004; NICHD, 2000; Sindelar, et al., 2002; Stoddard, et al., 1993; Therrien, 2004; Therrien, et al., 2006; Valleyley & Shriver, 2003); and (f) a small group approach, in which groups of three to five students pair off and take turns orally reading a passage (i.e., Begeny & Martens, 2006; Begeny & Silber, 2006; Homan, et al., 1993; Kuhn, 2005).

Despite the encouraging data for repeated readings and the widespread use of these above-listed methods for carrying out repeated readings including small group approaches, few studies were found that investigated the effects of small group peer-mediated repeated reading practice on fluency and comprehension. Those studies that did use small group peer-mediated approaches carried out the repeated reading portion using student dyads rather than groups of three to five students. The following section describes studies that have investigated the effectiveness of peer-mediated repeated reading instruction on improving reading skills. All of
the studies described next carry out peer-mediated RR using student dyads rather than small
groups of three to five students. No studies were found in which small groups of three to five
students took turns repeatedly reading passages.

*Peer-mediated Repeated Readings (RR).* Among the advantages of peer-mediated
strategies are: frequent error identification, the practicing of correct responses, immediate
feedback and correction, and help and encouragement from peers (Utley & Mortweet, 1997).
Many studies have used peer-mediated strategies to deliver repeated reading instruction (i.e.,
Begeny & Martens, 2006; Begeny & Silber, 2006; Fuchs, et al., 2001a; Fuchs & Fuchs, 2005;
Fuchs, et al., 2001; Gardner, et al., 2001; Green, et al., 2004; Homan, et al., 1993; Marchand-
Martella, et al., 2000; Rasinski, 1990; Staubitz, et al., 2005; Vaughn et. al, 2000; Yurick, et al.,
2006). All of these studies used peer dyads to deliver repeated reading interventions.

For example, Vaughn et. al (2000) found that students who were low- to average-
achieving and students with reading disabilities who engaged in peer-mediated repeated reading
as student dyads improved reading rate and correct words per minute. The intervention was
carried out two to three times per week for 12 weeks. Twenty-eight to thirty-one sessions were
delivered in total and sessions averaged 25 minutes in this condition. Effect sizes (calculated by
the original author) were .42 for correct words per minute on the Test of Reading Fluency and
.33 for reading rate on the Gray Oral Reading Test-3.

Green, et al. (2004) found that second grade students who received peer tutoring, as
student dyads, using RR and individual tutoring from college students showed a median gain of
26 words read correctly per minute compared to peers (who did not receive the intervention) who
showed gains of 20 words read correctly per minute. The gain for students receiving this tutoring
was evident after meeting with tutors for 20 minutes, twice a week, for 10 weeks. According to
Deno, Fuchs, Marston, and Shin (2001), students at the second grade level should increase approximately 1 to 1.5 words read correctly per week when monitored with curriculum-based measurement (CBM) probes at the second-grade level. The findings from this study indicate that the instruction improved reading growth rates for six out of 13 students who achieved gains above 3 words read correctly per week. Additionally five out of six peer tutors and nine out of the 11 tutees were interested in participating again, and all students believed the peer tutoring helped them, providing a measure of social validity.

Staubitz, et al., (2005) evaluated the effects of a peer-mediated repeated reading intervention on the oral reading fluency and comprehension of six urban fourth- and fifth-grade students with and at-risk for emotional or behavioral disorders. They used a multiple baseline design across subjects to study the effects of repeated reading versus sustained silent reading on reading fluency, comprehension, and generalization to unpracticed passages under covert and overt timing conditions. The intervention was introduced on a staggered basis so that the three pairs averaged 32, 17.5, and 11.5 sessions of repeated reading lasting 10-15 minutes. Students participated in 123 intervention sessions in which peer dyads alternated in repeatedly reading a passage for 10 minutes. Visual analysis of the multiple baseline design indicated that all students improved both reading fluency and comprehension on practiced and unpracticed passages and that the addition of overt timing and charting produced the greatest improvements. This study was limited in its investigation of peer-mediated intervention due to its use of the experimenter in carrying out the intervention at times. More specifically, only about 47% of the sessions were peer-mediated, and 86% of the sessions in which the mastery criteria were met involved pairing with the experimenter.
Yurick, et al. (2006) conducted three experiments to examine the effects of peer-mediated repeated readings on students’ oral reading fluency and comprehension. Each repeated reading session consisted of students reading in pairs and alternating paragraphs for 10 minutes, repeatedly reading the passage until time expired. Students received an average of 19 repeated reading sessions across four months in Experiment 1, 38.5 sessions across six and 2/3 months in Experiment 2, and 25.6 sessions across five months. Students used a scripted correction procedure when errors occurred and then participated in a 1-minute timed reading which was scored for number of words read correctly and errors. The three primary dependent variables that were investigated in this study were oral reading rate, accuracy, and comprehension. The investigators assessed comprehension using a cloze procedure when students reached a fluency criterion. Experiments 2 and 3 extended their findings by implementing the procedures in different grade levels and in different formats (total class and pull-out), and including generalization data. Multiple baseline designs were used to evaluate the results. Visual analysis of these graphs indicated that the peer-mediated repeated reading improved students’ (in grades 3, 4, and 5) oral reading rate, reading accuracy, and comprehension. Findings suggested that the improvement of reading fluency generalized to unpracticed grade-level passages.

Only a few studies (Begeny & Martens, 2006; Begeny & Silber, 2006; Kuhn, 2006) were found that investigated the effectiveness of small group peer-mediated reading fluency interventions. However, RR was still delivered as student dyads or with an adult within the small group intervention rather than with small groups of three to five students. For example, Begeny and Martens (2006) investigated the effectiveness of a small group fluency intervention that used a number of different instructional strategies (e.g. word-list training, listening passage preview, phrase drill error correction, and repeated reading) to examine the effects on 12 third-grade
students’ reading fluency and comprehension. The instructional sessions lasted approximately 15-20 minutes, and the entire study lasted about 9 weeks for one group and 11 weeks for the other group. The researchers provided small groups of students with intervention, but the RR component was still conducted with student dyads. The students received the instructional package as a small group and paired off for the repeated reading portion of the package. They found that students who were exposed to a peer-mediated instructional package that consisted of word-list training, listening passage preview, phrase drill error correction, and repeated reading components read more words per minute on trained passages and completed maze comprehension passages with higher accuracy and fluency (based on visual inspection of multiple baseline design). Students were divided into two instructional groups and results were analyzed between groups. Effect sizes [calculated by current author using following formula: Cohen's \( d = M_1 - M_2 / \sigma \); (Cohen, 1988; Parker et al., 2005)] were \( d = 3.7 \) for correct words per minute for Group 1 and \( d = 4.6 \) for Group 2. Effect sizes were \( d = 4.0 \) for words circled correctly per minute (maze) for Group 1 and \( d = 3.1 \) for Group 2. Additionally, students made statistically significant gains over time on nonpracticed passages of varying grade levels, on words lists containing both “trained” and “untrained” words, and on subtests of a commonly used standardized educational assessment tool (Woodcock Johnson-III).

**Summary of literature review.** Although there is substantial support for adult-mediated repeated reading and peer-mediated repeated reading strategies using student dyads, no research was found to support the use of peer-mediated repeated reading strategies with small groups of students (3 or more students). The potential advantage of using small groups of students is the conservation of teacher resources and time. Presumably, teachers can more easily monitor four groups of four students engaged in peer tutoring than eight pairs of students. Because the number
of students who need supplemental reading fluency instruction may often exceed resources, questions about how to most effectively and efficiently provide interventions must be addressed. If students who practice in groups of 4 make similar reading progress to students who are practicing as dyads, it may be more resourceful to implement reading fluency interventions in small groups.

This study was designed to extend and systematically replicate the existing peer-mediated repeated reading (RR) research conducted by Yurick et al. (2006) as well as a small group approach similar to that used in the study conducted by Begeny and Martens (2006). While Yurick et al. (2006) carried out the experimental conditions in their study as researchers, this study investigated the effectiveness of teacher implementation of the experimental conditions. Furthermore, Yurick et al. (2006) investigated the effectiveness of peer-mediated RR using student dyads. This research investigated the effectiveness of peer-mediated RR conducted with small groups of students.

The purpose of this study was to investigate the effects of small group peer-mediated repeated reading practice on reading fluency and comprehension for students at risk for reading failure. This study aims to further extend external validity arguments in using peer-mediated repeated reading interventions by extending research by group format and teacher implementation. Specifically, this study analyzed the effects of peer-mediated repeated reading using groups of three to five students on students’ oral reading fluency and comprehension.

Method

Participants and Setting

Teacher participant. A teacher volunteer was sought to take part in the study based on an interest in implementing strategies to improve oral reading fluency and comprehension for
students at-risk for reading problems. The teacher is a Caucasian female with 7 years teaching experience and 4 years of experience working at the target school. The classroom teacher taught the students the procedures, oversaw the peer-mediated repeated reading instruction for each participant, and collected assessment data.

*General school-wide selection for academic risk.* As part of the local school’s approach to service delivery, all students in the school were screened using Dynamic Indicators of Basic Early Literacy Skills (DIBELS, Good & Kaminski, 2001) three times per year. Additionally, classroom teachers use DIBELS to conduct additional classroom screening measures when they are concerned about the results of the initial school-wide screening. DIBELS are brief assessments that can be used to identify students (Kindergarten through 6th grade) with literacy problems and to monitor student progress. There are alternate versions of the assessments so they can be used repeatedly. DIBELS oral reading fluency assessments typically take approximately 2 minutes to administer. Students whose scores placed them within the “At Risk” or “Some Risk” categories assigned through DIBELS assessments are typically considered for additional intervention supports by schools. Good et al. (2002) established decision rules that utilize longitudinal predictive information to identify progressive benchmark goals for reaching subsequent early literacy goals and outcomes. They determined these goals from considering the data of all participants included in the DIBELS Data System. The levels were created so that a student is at “Low Risk” or “Established” if approximately 80% or more students with the score would achieve the goal for that measure. A categorization of “Some Risk” or “Emerging” is given if approximately 50% of students would achieve the goal. A student is considered to be in the “At Risk” or “Deficit” level if approximately 20% or fewer of the students with the score would achieve the goal.
Categorizations of “Some Risk” or “At Risk” indicate that the students are at some risk for reading failure and need more support. Specifically, students identified as “Some Risk” are said to be in need of “Strategic” support in the form of additional intervention. Students identified as “At Risk” are said to be in need of “Intensive” support in the form of a substantial intervention.

*Child participants targeted for reading intervention.* Based on the initial screening which indicated that a significant percentage of students in the classroom were “At Risk” or at “Some Risk” for reading problems (76% of students in the class were identified as “At Risk” or at “Some Risk” for reading problems; 4 students performing on or above reading level, 6 students at “Some Risk,” and 7 students “At Risk”), the classroom teacher determined that she wanted to institute a peer tutoring model that would include her whole class. This is a common practice in schools that is used in an effort to be efficient with resources and simultaneously address the academic needs of a majority of students. Likewise, repeated practice reading stories is an effective instructional practice for all students.

A second oral reading fluency screening was conducted (using the same procedures and materials from above) with students during the second DIBELS benchmark period. These data indicated that 41% of students continued to be at some risk for reading difficulties (10 students performing at or above reading level, 4 students at “Some Risk,” and 3 students “At Risk”). While this marked an improvement, the teacher still wished to institute a classwide program to address reading needs. At this time, all students DIBELS screening scores were placed in numerical order from lowest to highest in order to determine need. All students in the classroom initially received small group repeated reading practice ($N = 17$). However, 16 students (9 females and 7 males) took part in the study since one student opted out of the study after 4 weeks.
of tutoring because he believed his reading had improved (his reading scores had improved to goal-levels based upon assessment results and the teacher provided this student with seatwork instead). The data for the one student who opted out were not used in any analyses; all data analyses are based on the 16 students. These 16 students were assessed in reading fluency and reading comprehension before tutoring began, after 4 weeks of tutoring (approximate mid point of instructional intervention), and after 8 weeks of tutoring (at the end).

The reading scores of four students (fictitious names are Michael, Karen, Aaron, and Richard) with the lowest reading fluency scores in the class were assessed weekly. These targeted students were selected for more frequent monitoring based upon receiving the lowest reading fluency scores on the second DIBELS screening and teacher recommendation to include those students who had good attendance and good classroom behavior. Three male students and one female student were included in the study for more frequent data collection. One of the male students was identified with a learning disability during the school year. Although the teacher would have used this intervention and monitored student progress regardless of whether the study took place, parental permission and student assent were attained for all students in the class prior to beginning the study in order to use data for research purposes.

The teacher decided that four to five students per group would be the most manageable. Therefore the classroom was divided into four sections (see Table 1) and students targeted for weekly assessment were grouped and placed in one of the four sections collaboratively decided by the teacher and researcher. Since the class contained an uneven number of students, there were originally three groups of 4 students and one group of five students. However one group of four had a student who opted out of the study. Divisions were decided upon based on students’ oral reading fluency scores and teacher feedback. Students were placed in order from lowest to
highest reading scores and divided based on relative performance. Divisions were made so that each group was composed of a reader with (a) relatively high oral reading fluency scores, (b) relatively average oral reading fluency scores, and (c) low oral reading fluency scores and so that students were placed in groups in which they worked successfully together. In determining student groups, the teacher and researcher used Grossen and Carnine’s (1991) finding that students reading at a rate of less than 100 words per minute (for students at or above second grade) may have decoding problems that impede their comprehension of reading material. The teacher and researcher collaboratively decided on cut-off scores and used these to group students. Students reading less than 90 correct words per minute were categorized as students with “low oral reading fluency scores”; students reading 91-110 correct words per minute were categorized as students with “relatively average oral reading fluency scores”; and students reading 111 correct words per minute or more were categorized as students with “relatively high oral reading fluency scores.” This type of heterogeneous grouping is supported by research. For example, Mastropieri, Leinart, and Scruggs (1999) suggested that peer-tutoring in reading should consist of a stronger reader and a less strong reader. According to Karnes and Collins (1997), one effective instructional strategy is cooperative learning which among other things involves dividing classes into a small number of heterogeneous learning groups. They suggest that each group should be composed of students who differ in ability level (i.e. high, average, and low ability).

**Setting.** The research took place in a fourth-grade classroom that included 17 students (9 females and 8 males). The class was composed of 94% Caucasian and 6% Asian. The procedures used in this study were delivered in the morning during reading instruction. The classroom was in a suburban parochial school (Pre-Kindergarten through 8th Grade) in the Midwest.
Table 1

Group Characteristics

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<th>Raceᵇ</th>
<th>DIBELS Screening Scoresᶜ</th>
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<td>1ˢᵗ Screening</td>
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<td>Group 1</td>
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<td>50% F</td>
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<td>50% F</td>
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ᵃUnder gender, F represents the percentage of female participants and M represents the percentage of male participants. ᵆUnder race, C represents the percentage of Caucasian participants and A represents the percentage of Asian participants. ᵇDIBELS screening scores reflect the number of correct words per minute. ᵈThis participant was the target student identified with a learning disability. ᵉOne male student in Group 3 opted out of study.
Materials

Training materials, directions, scripts, and checklists that were used during the peer-mediated repeated reading instruction followed the same methods that were used by Yurick et al. (2006). In addition, the materials were reviewed by a teacher not involved in the study. The teacher’s feedback and suggestions were incorporated into the materials (i.e., wording and organizational elements were added to scripts so that the materials were more user-friendly for the teacher and students). The teacher who volunteered to take part in the study was also asked to provide feedback and modifications before the study began to make the materials more user-friendly (i.e., research schedule was modified, an additional day of training was provided, slight modifications to the organization of scripts). The teacher provided and explained the materials to the students with the current researcher’s support during student training (see Appendix A-D).

Measures

Screening

As introduced above, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS, Good & Kaminski, 2001) oral reading fluency (ORF) assessment for 4th grade was used for screening. DIBELS are designed to be short (one minute) fluency and comprehension curriculum-based measures used to regularly monitor the development of pre-reading and early reading skills. These measures and supporting documentation are available at http://dibels.uoregon.edu.

DIBELS ORF consists of a set of passages and administration procedures designed to (a) identify children who may need additional instructional support, and (b) monitor progress toward instructional goals. The passages are calibrated for the goal level of reading for each grade level. DIBELS ORF measures are standardized individually administered curriculum-based measures
of accuracy and fluency with connected text. The probes were created for the DIBELS measurement system and controlled for readability. Students are given three grade-level passages and asked to read aloud for one minute. Errors are words omitted, substitutions, and hesitations of more than three seconds. Words self-corrected within three seconds are not marked as an error. The oral reading fluency rate is the median number of correct words per minute across the three passages (Good, Simmons, & Kame’enui, 2001). All reading probes were administered individually by school personnel following the curriculum-based measurement standardized procedures described above (see also Good, Kaminiski, & Dill, 2002; Shinn, 1989). Measures of oral reading fluency from curriculum-based passages are used as indicators of reading achievement (Shinn, 1997). Students’ performance on these indicators is then compared to grade-level performance expectations to identify children at risk of reading disability.

As explained earlier (see General school wide selection for academic risk), all students in the classroom were targeted for intervention based on a high percentage of below-average DIBELS scores when compared to DIBELS benchmarks. Additionally, all students in the classroom were rank-ordered based on the ORF scores collected during the second screening. Targeted students were selected for more frequent data collection based on teacher recommendation and DIBELS screening scores that place them at the bottom of the class in terms of oral reading fluency.

While DIBELS ORF is widely used as a screening measure, specific reliability and validity information was not found for its use as a screening measure. However, DIBELS is a form of curriculum-based measurement and curriculum-based oral reading fluency measures have been extensively researched (e.g. Good & Jefferson, 1998; Marston, 1989) and have been found to have good reliability and validity. In fact, recent research has provided more evidence
for the effectiveness of CBM of reading for screening, referral, and classification (e.g. Fewster & MacMillan, 2002; Wilson et al., 1992). For example, Fewster and MacMillan (2002) found that CBM scores predict classroom placement: special education, remedial, general education, and honors class. Research also supports the utility of oral reading fluency assessment as reliable, valid, and useful predictor of student reading performance on high stakes state tests (Good, et al., 2001).

**Dependent Variables**

*Adaptive progress monitoring.* As was mentioned earlier, initial screening results indicated a need for classwide intervention (76% of students at risk for reading failure). Specifically, four students were performing on or above reading level, six students were identified as being at “Some Risk,” and 7 students were identified as “At Risk”. A second oral reading fluency screening was conducted (using the same procedures and materials from above) with students during the second DIBELS benchmark period. These data indicated that 41% of students continued to be at some risk for reading difficulties (10 students performing at or above reading level, 4 students at “Some Risk,” and 3 students “At Risk”). Assessment schedules were developed based upon students’ relative performance on the screening assessments.

All students were assessed once before receiving the peer tutoring, once after 4 weeks of peer tutoring (approximate mid-point of tutoring), and once after 8 weeks of peer tutoring (end of tutoring). Four students with the lowest oral reading fluency scores in the class were assessed in oral reading fluency and reading comprehension at these times and more frequently to determine if the classwide strategies were helping. The assessments used were the same for all students.

*Oral reading fluency.* During intervention, students repeatedly practiced reading from a 150-400 word AIMSweb comprehension passage (maze) that had been left intact (no words
omitted). The reason this type of passage was selected was because it provided the teacher with a consistent measurement system for fluency and comprehension. Curriculum-based measurement was used to monitor student progress in oral reading fluency on these passages after practicing them. Specifically, students’ oral reading fluency was measured by counting the number of words read correctly per minute after practicing reading the AIMSweb passage.

After the students had practiced repeatedly reading an AIMSweb passage, they were asked to read aloud to their teacher from the passage for one minute. Words omitted, substituted, and hesitations of more than three seconds were scored as errors. Words self-corrected within three seconds were scored as accurate. The number of correct words per minute from the passage was the oral reading fluency rate.

The assessment consisted of a single reading passage, which students read aloud for one minute. The same scoring rules that were used for screening were also used for progress monitoring, but only one passage was used and the oral reading fluency rate was the number of correct words per minute. DIBELS ORF (Good & Kaminski, 2001) directions and scoring procedures were used to monitor progress. All reading probes were administered individually by the teacher following these standardized procedures.

ORF measures have been found to have a median alternate form reliability of .94 (Good, Wallin, Simmons, Kame’enui, & Kaminski, 2002). Test-retest reliabilities for elementary students ranged from .92 to .97; alternate-form reliability of different reading passages drawn from the same level ranged from .89 to .94 (Tindal, Marston, & Deno, 1983). Good and Jefferson (1998) provide a summary of criterion related validity of curriculum-based reading measurements. They included within-grade validity coefficients with publicly available criteria (includes published norm-referenced tests, published criterion-referenced tests, or tests from a
publisher’s basal reader series) in oral reading fluency. The median validity coefficient of concurrent, criterion-related validity for sixth grade oral reading fluency passages was found to be .66 (Good & Jefferson, 1998). Criterion-related validity was investigated in eight separate studies in the 1980s and coefficients are reported ranging from .52 - .91 (Good & Jefferson, 1998). Good and Jefferson (1998) found that all curriculum based measurements of reading had validity coefficients in the .60 to .80 range and offered that this supports the construct validity of reading.

Comprehension. The other dependent variable was students’ performance on AIMSweb maze probes after they had been practiced during intervention. Reading comprehension was assessed using the same passages as used during intervention. The maze task (Edformation, 2002) was used to assess comprehension gains. Maze is a multiple-choice close task that students complete while reading silently. The first sentence of a 150-400 word passage is left intact. Thereafter, every 7th word is replaced with three words inside parentheses. One of the words is the exact one from the original passage. Research has shown that this provides a reliable and valid measure of reading comprehension (National Center on Student Progress Monitoring, 2005).

Edformation has developed sets of Standard Reading Maze Passages for maze testing practices and for use in the AIMSweb formative assessment and improvement system. Maze-CBM reading comprehension passages for progress monitoring are a set of 30 graded and equivalent passages at each level, primer and Grades 1-8 (20 in First Grade), for frequent assessment of at-risk students. Administration, scoring rules, and norms are provided through AIMSweb. AIMSweb materials can be downloaded with the purchase of a materials license. The current researcher purchased a license to attain these materials. Students were provided with 3
minutes and asked to circle the word (given a choice of three) that best completed the sentence. Students’ answers were compared with the answer key. Correct answers were those that matched the answer key. All the correct answers were totaled and this number was the student’s score on the maze assessment. The National Center on Student Progress Monitoring (http://www.studentprogress.org/chart/chart.asp) conducted a review of progress monitoring tools in 2005. The results of their review indicated that the AIMSweb maze reading comprehension passages are reliable and valid for progress monitoring. They also found that they are sensitive to student improvement and improve student learning or teacher planning. Curriculum-based measurement oral reading fluency and the AIMSweb maze measures were used in this study to monitor and compare student progress in the repeated reading program.

The teacher individually monitored the four target students’ progress using oral reading fluency scores on practiced passages weekly. Immediately afterward, the AIMSweb maze probes were administered by the teacher to the four target participants once per week. Oral reading fluency and reading comprehension were monitored in the same manner, but less frequently (0 weeks, 4 weeks, and 8 weeks) for the rest of the class.

*Procedural Adherence and Reliability of Child Performance Measures*

*Adherence to Experimental Procedures (Post-Training)*

All scripts were provided by the researcher to the teacher and students in addition to an assessment record (see Appendix E) and a schedule. They outlined procedural steps for the methods that comprise the independent variable. The scripts were also used to measure adherence. The scripts contain a list of steps pertaining to the peer tutoring condition.

*Student self-check of adherence.* Students used a script and a log in order to better adhere to the procedures. They used the script as a guide and checked off steps as they were completed.
as a measure of adherence. Students were asked to complete this scripted checklist during each instructional session. This self-check was used as one means of measuring adherence to the experimental procedures. Adherence was calculated by dividing the total number of steps by the number of steps carried out correctly and multiplying by 100.

Students also maintained a log in order to provide the teacher and current researcher with additional information. They wrote their names, the date, the time, passage number, and the number of times the passage was reread on a log sheet. The purpose of this log was to record words and dates of any miscues committed by student groups during the repeated reading session. It also provided information on the length of time spent practicing.

_Teacher adherence self-check_. Student accuracy in carrying out the procedures was assessed directly by the teacher who observed student groups by following the student script during 33% of intervention sessions. The teacher observed each group during one intervention session weekly to observe procedural adherence. She indicated whether students completed the step accurately by placing a checkmark next to each step completed correctly. The percentage of steps completed accurately was calculated by dividing the total number of steps by the number of steps completed accurately and multiplying by 100. When the teacher was not directly assessing adherence, she directly intervened with students who were not carrying out the steps accurately. She modeled the steps and provided error correction and feedback. Additionally, the teacher logged the number of times she directly interacted with the students during tutoring and the length of time she spent with the students during tutoring.

_Researcher check of adherence_. The adherence to the control and experimental procedures was assessed directly for approximately 33% of the sessions by the researcher using the same checklist developed for the participants. The researcher determined whether the teacher
followed the steps for the condition appropriately by making a checkmark next to the item on the teacher checklist. The number of checkmarks for completed steps was divided by the number of potential steps and multiplied by 100 in order to get an estimate of adherence. The researcher also checked the students’ adherence to procedures once per week (approximately 33% of intervention sessions) by observing each group carrying out the intervention and checking off items on the student checklist when intervention steps were accurately completed. The number of checkmarks for completed steps was divided by the number of potential steps and multiplied by 100 in order to get an estimate of adherence.

Procedural adherence results. On average (across all adherence checks), student adherence to procedural steps was calculated based upon researcher’s adherence checks to be 95% across groups (Group 1 = 93%, Group 2 = 97%, Group 3 = 95%, Group 4 = 96%). Based on teacher calculations, student adherence to procedural steps was judged to be 97% across groups (Group 1 = 95%, Group 2 = 99%, Group 3 = 96%, Group 4 = 97%). The students were observed to have the most difficulty with reading the passage at least 3 times during the 10-minute period (on initial introduction of the passage; Day 1 of the three day cycle) and recognizing when peers made errors. Overall, students recorded that they had read passages an average of 3.9 times in a 10-minute period. The students were only required to read the passage 3 times, but were instructed to read it as many times possible during the ten-minute period.

The teacher logged the amount of time spent with each group. The teacher logged an average of approximately 10 minutes spent directly working with each group during training. On average the teacher logged that she had visited each group at least once during each intervention session. The teacher approximated on the logs that she spent an average of 1.28 minutes weekly with each group. As self-reported on teacher logs, the teacher spent a weekly average of 1.3
minutes ($SD = .46$) with Group 1, 1.4 minutes ($SD = .74$) with Group 2, 1.3 minutes ($SD = .71$), with Group 3, and 1.1 minutes ($SD = .35$) with Group 4. Therefore, it is argued that all groups received approximately equal amounts of teacher interactions.

Intervention procedural adherence also was measured by the researcher ($N = 19$). The teacher was observed to carry out 95% of procedural steps accurately during training and 88% of procedural steps during intervention. The step that the teacher typically had the most difficulty carrying out was the step that included monitoring student groups for accuracy and correcting student errors.

Assessment Reliability and Integrity

Standardized directions were used by the teacher as scripted in the DIBELS and AIMSweb assessments. In addition, the teacher’s assessment skills were calibrated with the current researcher, who is experienced with both assessments, before assessing any children. Interobserver agreement measures were collected for approximately 33% of the sessions across student participants.

The administration of assessments was observed by the current researcher to determine whether the assessments were carried out reliably by following the same scripted assessment protocol and co-scoring the probes. The maze assessment provided a permanent product that was co-scored to determine reliability (approximately 33% of assessments were co-scored). Interobserver agreement was calculated for each dependent variable during each observed session across all participants by dividing the number of agreements by the sum of agreements and disagreements and multiplying that number by 100. An agreement was scored for words correct per minute if both observers counted the same number of words and miscues read per minute by the participant. On the maze assessment, an agreement was scored if both observers
evaluated the comprehension response as correct. The current researcher evaluated adherence to the standardized procedures and scoring using the checklists provided by DIBELS and AIMSweb. Adherence to the standardized assessment procedures was calculated by dividing the total number of assessment steps by the number of steps completed and multiplying by 100.

Assessment reliability and adherence results. Administration of assessments by the teacher was observed by the current researcher for scorer reliability and adherence to procedural directions ($N = 17$ reliability and adherence checks for comprehension measure; $N = 23$ reliability checks and adherence checks for oral reading fluency measure). Scorer reliability for the oral reading fluency measure was found to be 99%. Scorer reliability for the comprehension assessment was found to be 100%. Adherence to the oral reading fluency assessment procedures was found to be 100% and adherence to the comprehension assessment procedures was found to be 99%.

Design and Experimental Conditions

This study used a multiple baseline (MBL), single-case research design across four child participants (Cooper, Heron, & Heward, 2007; McCormick, 1995). Each baseline represented unpracticed grade-level oral reading fluency scores and maze comprehension scores for each of the four targeted students. Although students were practicing in groups, only oral reading fluency data for specific individual children selected based on reading difficulties was used for decision-making in terms of the introduction of the experimental condition.

The multiple-baseline design was appropriate for classroom instruction because it offered a natural way for the teacher to implement a new strategy with a class (McCormick, 1995). The technique of staggering the introduction of an intervention allowed the teacher time to get the intervention up and going with a few students at a time. It provided the teacher with the
necessary time to ensure that each group of students was fluent with the procedures before introducing procedures to the next group of students.

Targeted students \( (n = 4) \) were assessed using the same probes on the same dates. All of the participants were exposed to two conditions, sustained silent reading of classroom novels (baseline) and small group repeated readings of grade-level passages (intervention).

The teacher was responsible for announcing the sections to the classroom. All students in one classroom were offered the intervention and four students’ scores were monitored weekly. As was mentioned previously, the class was divided into 4 sections/groups based on relative performance on screening measures and teacher recommendation (see Table 1). Group 1 began the intervention and 3 weeks later, Group 2 and Group 3 began the intervention, and finally 3 weeks later Group 4 began the intervention. The four targeted students were assigned to Group 1, Group 2, Group 3, and Group 4 respectively. Two targeted students received the intervention at the same time as part of two separate groups (Group 2 and Group 3). This was done due to time constraints that existed at the school that would not allow for 4 groups to have intervention times staggered. The teacher decided which groups would begin together. The teacher decided that she would like the first group to start by itself in order to get the intervention routine running smoothly before introducing it to a greater number of students. She then decided to have Groups 2 and 3 begin the intervention because the students were anxious to get started and it was easier for her to monitor one group of students that were not participating in the study at that time. Hayes, Barlow, and Nelson-Gray (1999) provide support for shifting two or more series at the same time within the multiple baseline design as is done in this study. The current researcher advised the teacher when the data were adequate to introduce each group to the peer-mediated RR and the teacher announced when each group would begin the peer-mediated RR.
Based on the literature review, there are large ranges of time spent in instruction. This study provided 10 minutes of intervention 3 times per week for 8 weeks (240 minutes). This amount of peer-mediated RR was selected as an appropriate minimal length of time to determine effects based on similar research on reading interventions in which the typical intensity of contact ranged from 195-4050 minutes (Cohen, 1988; De la Colina, Parker, Hasbrouck, & Lara-Alecio, 2001; Denton, Anthony, Parker, & Hasbrouck, 2004; Fuchs, Fuchs, Mathes, & Simmons, 1987; Marston, Deno, Dongil, Diment, & Rogers, 1995; Mathes & Fuchs, 1993; Simmons, Fuchs, Fuchs, Mathes, & Hodge, 1995; Torgesen et al., 2001; Vaughn, et al., 2000; Vaughn, Linan-Thompson, Hickman, 2003). For those studies that did not calculate the number of minutes of intervention, the duration of similar interventions ranged from four to 85 days (Daly & Martens, 1994; De la Colina, et al., 2001; Fuchs, Fuchs, & Compton, 2004; Gilbert, et al., 1996; Rashotte & Torgesen, 1985; Rose, 1984; Swain & Allinder, 1996; Rose & Beattie, 1986; Vellutino et al., 1996).

This study used combined criteria for intervention phase length that included steady state logic and fixed criteria. Steady state logic is basic to MBL designs (Cooper et al., 2007) and fixed time intervals have been used by many intervention researchers due to realities of settings (Iwata, et al., 1994; Kazdin, 1982). Furthermore, outcomes that can be expected over set time intervals are questions that need to be addressed by recent reforms (Response to Intervention-RTI; e.g. Fuchs, et al., 2004).

Oral reading fluency scores for the four targeted students provided baselines against which changes could be evaluated. The intervention was introduced to the first group of students after a stable baseline or trend in the desired opposite direction for ORF scores had been documented for the targeted student in Group 1; Michael. The peer tutoring was introduced to
Groups 2 and 3 once there was a stable level of responding or there was a trend in the desired direction (in ORF scores) for Michael. Finally, the peer tutoring was introduced to Group 4 once a stable level of responding or trend in the desired direction had been documented for the targeted students in Groups 2 and 3 (Karen and Aaron).

Plans for Changing Conditions

Since it was possible that each individual student would not achieve a stable level of responding, an alternative was developed for introducing the program to other students. Based on research and the practical constraints that exist for the school, and, consistent with response to intervention (RTI) research and the need for decision rules guiding intervention planning, the current author decided if a steady state had not been established for the targeted student in Group 1 after three weeks, Group 2 and 3 intervention would begin and the same process would be repeated for Group 4. As was mentioned earlier, the decision to shift Groups 2 and 3 together was based upon teacher recommendation and time constraints at the school.

De la Colina, et al. (2001) used a fixed time interval of three and five weeks respectively within their multiple baseline design when they examined the Read Naturally Program. Given the fact that this intervention took place within a school, it may be more beneficial to examine whether changes were observed after a fixed amount of time. This allows for an examination of the required amount of time spent in intervention before positive results can be anticipated. Therefore, while continuing baseline observations for varying lengths across the different subjects is appropriate from an experimental standpoint, withholding educational intervention would be ethically questionable.

Data Analysis
Data were analyzed using visual analysis and descriptive statistical analysis. Target student data for the MBL design were analyzed both within and between subjects using step-by-step preplanned comparisons (Hayes, et al., 1999). Within-subjects between conditions were analyzed by procedures recommended by Fisher, Kelley, and Lomas (2003). Fisher, et al. (2003) conducted three studies in which they developed and analyzed criteria for improving visual inspection and interpretation of single-case designs. The authors developed a dual criteria (DC) and conservative dual criteria (CDC) method for interpretation of single-case data. These methods are refinements of the split-middle (SM) method in which they use a regression line from baseline data and superimpose this line on the treatment phase. These methods include the use of the SM method and also include the use of a mean line from baseline data that is superimposed on the treatment phase. Using the DC methods two criteria must be met: (a) a prespecified number of treatment data points had to fall above the trend line based on the binomial method (as with the SM model), and (b) the same number of data points also had to fall above the mean line for a sample data set. The CDC method used the same prespecified number of points, but raised the height of the two criterion lines by .25 standard deviations (calculated from the baseline data points). The authors determined that these interpretation techniques improved interpretation accuracy.

Effect size was calculated using the Cohen’s d formula \( d = \frac{M_1 - M_2}{\sigma}; \) (Cohen, 1988; Parker et al., 2005). The percentage of nonoverlapping data (PND) was calculated by determining the proportion of data points in the intervention condition that exceeds the extreme value in the baseline condition. In an intervention intended to increase behavior, this would be the proportion of intervention data points that exceeds the highest baseline value. More specifically, PND was calculated by counting the number of intervention points that did not
overlap with baseline points, dividing by the total number of points, and multiplying by 100 (Scruggs, Mastropieri, & Casto, 1987). Class-wide assessments (n = 3) were graphed by using box plots of distributions for visually analyzing differences by conditions.

Procedures

Teacher training. Training was planned for 4 twenty-minute sessions and consisted of outlining and reviewing the research design and procedural steps using the scripts created (see Appendices A-E). The total amount of time logged as time spent in training was 95 minutes. The training was a collaborative endeavor in which steps and procedures were described by the current researcher, materials were shared with the teacher, and the teacher was provided the opportunity to ask for clarification. The teacher was asked to provide feedback and make suggestions regarding materials in order to make the materials user-friendly.

The teacher provided the training to the students. The training and intervention sessions were observed by the current researcher and modeling, coaching, and/or feedback were used during weekly meetings when the teacher had difficulty implementing the procedures. The teacher was provided with ongoing support and training with the materials before implementing procedures and during implementation. The teacher was determined to need additional support if adherence data indicate adherence to less than 70% of the training steps or procedural steps. Modeling and coaching were used when the teacher had specific questions regarding implementation and were used immediately when problems were noted with implementation. Feedback was to be used when specific implementation problems were noted or when the percentage of steps carried out accurately was less than 70%. Feedback was to consist of presenting student academic performance data (outcome data) and teacher intervention implementation data (process data) to the teacher in the form of a simple graph and discussing
any problems that arose with implementation. These steps were not needed during the study because the teacher’s adherence to procedural steps was never below 70%. Similar procedures have been shown to be effective (e.g. Noell, et al., 2000).

**Baseline- Sustained silent reading (SSR).** Prior to the introduction of peer tutoring, traditional general education reading instruction took place as the baseline condition. During this study, this condition consisted of sustained silent reading of grade-level novels. During this condition, selected students were assessed weekly by their teacher using grade-level oral reading fluency and maze comprehension scores. Students not included in the current session of the experimental condition (peer-mediated RR) were directed by the teacher to read silently for 10 minutes. Once a week, the teacher first individually asked targeted students to read an AIMSweb reading passage aloud while the teacher marked errors. Next, the teacher administered the same passage as a maze task, with words omitted, to assess comprehension on passages with the targeted students.

**Student participant training.** Training to teach students RR steps was conducted by the teacher in four 20- to 30-minute sessions over four school days after baseline data had been collected and before the repeated reading condition (see Appendix A). Student training was conducted once with the entire class and steps were reviewed again by the teacher with each group as students were introduced to the intervention. The first session of trainings conducted by the teacher consisted of modeling the entire process and focused on modeling and practicing the listeners’ role in the procedure. More specifically, the teacher modeled the steps for rereading the story three times and using the correction procedures. The second training session conducted by the teacher consisted of modeling the entire process and focused on modeling and practicing the reader’s role in the procedure. The third training session conducted by the teacher included
modeling how to independently practice procedures. The teacher then asked the students to independently practice the complete procedure (reading and correction procedure) while she observed and gave feedback. A fourth and final training was added for continued independent practice with the steps because students had not yet demonstrated adequate accuracy with the steps. When all students in the class demonstrated accurate skill (100% accuracy) in carrying out the procedure without prompting from the teacher, the small group repeated reading condition began. Accuracy in carrying out the procedure was assessed directly by the teacher who observed student groups by following the student script. She indicated whether students completed the step accurately and the percentage of steps completed accurately was calculated by dividing the total number of steps by the number of steps completed accurately and multiplying by 100. Adherence data and the amount of time spent in training were monitored by the current researcher during training. Adherence was measured by dividing the total number of steps by the number of steps completed accurately and multiplying by 100%. Yurick et al. (2006) used a similar training model. Before the program began, 2 students indicated on surveys that they were concerned that they may be teased for reading difficulties. As a result, during training, the teacher and researcher decided to specifically instruct students that this was a cooperative group and that any negative behavior would be corrected immediately. Additionally, a behavior management system was used to reinforce positive behaviors. Students were given tickets for following classroom rules that could be exchanged for small rewards (e.g. pencils, stickers, etc).

**Intervention: Peer-mediated repeated reading.** Three times per week, students were directed by the teacher to repeatedly read from a short AIMSweb reading passage (see Appendices A-D). Each student with the lowest reading skills was grouped with three to four classmates (see Table 1). The teacher and researcher selected students based on observations
about students who would work well together and (as described earlier) each group was composed of at least one student with relatively high oral reading fluency, one with relatively average oral reading fluency, and one with low oral reading fluency. The teacher directed the students to sit in a circle in the general education classroom and remain in close proximity. During the student training, the teacher directed students to obtain a folder that contained a script and a log (see Appendices A-D). The teacher set a timer for 10 minutes and instructed the students to begin reading. The students were directed by the teacher to alternate turns on each paragraph of the passage. When the students finished the passage, they would go to the beginning of the passage and read it again in the same fashion until they had read the passage at least 3 times. Students read one passage per week and then they were assessed on that passage. Yurick et al. (2006) used a similar methodology in which both the tutor and tutee were involved in RR.

Student groups were taught by the teacher during training to use a three-step scripted error correction procedure when a student commits a miscue during reading. The student who was assigned to read next was assigned the role of using the three-step procedure. The first step of the correction procedure was for the student to stop the reader and point to any word that the reader hesitated with, skipped, or misread. During the second step, the student told the reader the word. Finally, during the last step the student asked the reader to repeat the word and then continue reading. The purpose of the last step was to provide additional practice with the miscued word. Yurick et al. (2006) used a similar correction procedure in their study.

All students were assessed in reading fluency and reading comprehension before beginning the tutoring (all students were assessed once as part of general school-wide screening in reading fluency and comprehension; this classroom was assessed again by the teacher after the
schoolwide screening; targeted students were assessed multiple times in order to collect baseline data). Likewise all students’ progress in reading fluency and reading comprehension was monitored after 4 and 8 weeks of peer-tutoring. The four targeted students with the lowest oral reading fluency scores in the class were assessed weekly over approximately 8 weeks of intervention. To evaluate intervention effects for the four targeted students with the most significant reading needs, the teacher assessed each student at the end of each week using the same practiced passage and had the student read aloud from the passage for one minute while she marked errors. These scores were used to calculate the oral reading fluency dependent measures. Afterward, the teacher asked the four target students to complete a grade-level maze assessment each week (same passage that was practiced, but now with the words omitted).

Adequacy of Experimental Controls

In order to analyze resulting differences, planned controls for potential confounding variables related to experimental conditions were built into the study with reading logs and adherence checks. This study controlled for teacher role by estimating teacher-child interactions that could offer alternative explanations of outcomes (i.e., more teacher interactions, better outcomes regardless of type of instruction). As mentioned earlier, this was measured by having the teacher log the amount of time she spent directly intervening with students during the peer-mediated RR sessions.

Social Validity

Social validity was assessed in several ways throughout the study (see Appendices F-H). First, prior to the start of the study, meetings were held with school personnel to plan the study and attain interest in the research. The research was explained and any suggestions provided by
the teacher were incorporated into the plan. Ongoing communication was used to address concerns and questions and to make necessary changes.

Additionally, all of the students’ long-term goals followed AIMSweb and DIBELS recommendations (Edformation, 2002; Good & Kaminski, 2001). Graphs were created for each student on each skill being assessed. Goal lines were used to determine the effectiveness of the instruction. The effectiveness of the repeated reading instruction was determined by investigating the differences between the control and experimental conditions.

Social validity surveys were administered with students and the teacher before, during, and after the repeated reading instruction to assess the acceptability of goals, procedures and outcomes. A script acceptability questionnaire (adapted from Witt & Martens, 1983) was given to the teacher after the first week of implementation. An intervention rating profile (adapted from Erhardt et al., 1996) was given to the teacher three times (before the study began, at the midpoint of the study, and at the end of the study) during the study. Additional social validity questionnaires were created and given to students three times during the study (final day of training, week 4 of intervention, and week 8 of intervention). These questionnaires assessed satisfaction, perceived effectiveness, acceptability, feasibility of the procedures, and outcomes of the repeated reading instruction. All questionnaires were self-administered and anonymous.

Results

The purpose of the study was to investigate the effects of small group peer-mediated repeated reading practice on reading fluency and comprehension for students at risk for reading failure. The following sections will summarize reading outcomes and social validity results.
**Reading Outcomes**

The purpose of the study was to investigate the effects of small group peer-mediated repeated reading practice on reading fluency and comprehension for students at risk for reading failure. Results were analyzed at both the individual student and classwide level in a class of struggling readers. The results of this study can be found below (see Figures 1-4).

Figures 1 and 2 present the multiple baseline design in oral reading fluency and reading comprehension (respectively) for the four target students. Any discontinuous data is the result of academic breaks (school events, holidays, exams). Each data path in Figure 1 represents the individual oral reading fluency data for Michael (Group 1), Karen (Group 2), Aaron (Group 3), and Richard (Group 4). Each data path in Figure 2 represents the individual reading comprehension data for Michael, Karen, Aaron, and Richard within peer-mediated Groups 1, 2, 3 and 4 respectively. Each graph contains a goal line and an aim line. The goal line is drawn to display a visual reference point of expected levels (based on national DIBELS and AIMSweb standards) to be achieved by the end of the school year. The aimline provides a measure of expected growth required to reach expected goals. It is drawn from the median of the last 3 baseline points to the goal line.

*Reading fluency outcomes.* Based on visual analysis, in Figure 1 it appears that all four students benefited from additional repeated reading practice in groups. Baseline data in ORF for Michael display a low stable level. Minimal variability is displayed in the baseline data for Michael’s ORF. Baseline data in ORF for Karen display a low level. There is slight variability in the baseline ORF data for Karen. Baseline data in ORF for Aaron display a low relatively stable level. Aaron’s baseline data display slight variability. Baseline data in ORF for Richard also display a low level. Some variability is noted in Richard’s data with the last three data points
Figure 1. Multiple baseline in oral reading fluency for four target students

Oral Reading Fluency

---

Michael

Before Peer Tutoring

Group Peer Tutoring

Goal = 118 by end of year

Spring Break

---

Karen

Before Peer Tutoring

Group Peer Tutoring

Goal = 118 by end of year

Spring Break

---

Aaron

Before Peer Tutoring

Group Peer Tutoring

Goal = 118 by end of year

Spring Break

---

Richard

Before Peer Tutoring

Group Peer Tutoring

Goal = 118 by end of year

Spring Break
Figure 2. Multiple baseline design in reading comprehension for four target students.

Reading Comprehension

Before Peer Tutoring | Group Peer Tutoring
---|---
Michael
Score | Goal = 20 by end of year
School Date
Karen
Score | Goal = 20 by end of year
School Date
Aaron
Score | Goal = 20 by end of year
School Date
Richard
Score | Goal = 20 by end of year
School Date
becoming more stable.

Within subject changes in oral reading fluency for all students indicates an improvement in level when the reading program was introduced. Intervention data in ORF for Michael display an overall higher level when compared with the baseline level. Michael’s intervention data in ORF show minimal variability in the data with more stable data depicted by the last four data points. Intervention data in ORF for Karen display an overall high stable level (average reading level) that is an improvement when compared with the baseline level. Karen’s intervention data in ORF are characterized by minimal variability in the data. Intervention data in ORF for Aaron display a relatively stable and high level (average reading level) and demonstrate an improvement when compared to baseline. Minimal variability is displayed in the data. Finally, the intervention data for Richard display a higher level (average reading level) when compared with baseline data.

Michael and Aaron were the only students who displayed a positive trend after the intervention was introduced, but this trend appears to have been lost after the first 4 weeks of intervention. This may indicate a loss of experimental control for these students.

In addition to visual analysis, dual criteria (DC) and conservative dual criteria (CDC) methods (Fisher, et al., 2003) were used to interpret the oral reading fluency results for the four target students. Based on the DC method criteria, in the area of oral reading fluency, the program was effective for all four students. The results of all four students demonstrated that 100% of oral reading fluency intervention data points exceeded the superimposed baseline trend line and baseline mean. Similarly, based on the CDC method criteria, the program was effective for all four students in the area of oral reading fluency. More specifically, 100% of the students’ data exceeded the superimposed baseline trend line and baseline mean. Using the DC and CDC
methods, 87.5% of treatment data should exceed both the baseline trend line and baseline mean in order for the treatment to be considered effective. Therefore the program seems to be effective for all four students in the area of oral reading fluency. These graphed results may be found in Appendix I.

**Reading comprehension outcomes.** Based on visual analysis of data in Figure 2, it appears that all four students benefited from the tutoring program. Baseline data in comprehension for Michael display a relatively low stable level and minimal variability in the data. Baseline data in comprehension for Karen display an average level and minimal variability in the data. Baseline data in comprehension for Aaron display mostly a below-average level with some average data points and minimal variability in the data. Baseline data in comprehension for Richard display a below-average to average level and some variability in the data with the last three data points being most stable.

Intervention data in comprehension for Michael display a higher level but the overall level is still below average. Michael’s comprehension data show minimal variability during intervention. Intervention data in comprehension for Karen display a high stable level when compared with baseline and minimal variability in the data. Intervention data in comprehension for Aaron display a higher level when compared with baseline. There is minimal variability in Aaron’s comprehension data during intervention. Intervention data in comprehension for Richard display a higher level when compared with baseline and some variability in the data.

The dual criteria (DC) and conservative dual criteria (CDC) methods (Fisher, et al., 2003) were also used to interpret comprehension results. Based upon the DC and CDC method, only two students benefited from the reading program in the area of reading comprehension, Karen and Michael. More specifically, using both the DC and CDC methods, 100% of Michael’s data
exceeded both the superimposed baseline mean and baseline trend. Using both the DC and CDC methods, 87.5% of Karen’s data exceeded the superimposed baseline trend and 100% of her data exceeded the superimposed baseline mean. For Aaron and Richard the results were not as favorable in the area of reading comprehension. Based on DC and CDC method results, 62.5% of Aaron’s comprehension data exceeded the superimposed baseline trend and 100% of his comprehension data exceeded the superimposed baseline mean. For Richard, 37.5% of his comprehension data exceeded the superimposed baseline trend and 100% of his data exceeded the superimposed baseline mean. When using the DC and CDC methods, 87.5% of treatment data should exceed both the baseline trend line and baseline mean in order for the treatment to be considered effective. These graphed results can be seen in Appendix I.

Within subject changes in comprehension for all students indicate an improvement in level when the reading program was introduced. However, although Michael’s level improved slightly during intervention, he still displayed low comprehension data. All students display some minimal variability in data across phases that can be attributable to measurement error as well as performance variations.

*Overall visual analysis interpretation.* The general level of reading fluency and comprehension scores is higher after receiving the program for all four students. Three replications of the effect provide greater confidence in the reading program. The effects of the reading program appear relatively consistent across all four students with changes in level occurring immediately across students. Additional data may have been necessary in order to interpret trend. Experimental control appears to be lost for Michael’s comprehension data after the first four weeks of intervention and for Aaron’s comprehension data after the first five weeks of intervention. The students had relatively little intrasubject variability during baseline and
intervention. This intrasubject variability appears to take on similar characteristics across students which may be explained by inherent differences in the measurement passages (e.g. difficulty of passages for this particular group of students).

Based on between subject changes in oral reading fluency and reading comprehension, the data indicate a replication effect across the four students. This provides evidence of internal validity. However, there appears to be a loss of experimental control for Michael’s and Aaron’s comprehension data. Interpretation aids such as the DC and CDC methods showing that the program was effective in improving oral reading fluency level for all four students lend further support to internal validity arguments.

In summary, there appears to be a consistent repeated pattern across all four students indicating reading improvements. Changes in level were observed across all four students once the reading program was introduced. Likewise, there do not appear to be changes in the stability of data across baseline and treatment phases; there is little intrasubject variability across phases. Future researchers may wish to plan on collecting more data (Christ, 2006) since immediate changes in trend were not apparent. As mentioned above, extraneous variables cannot be ruled out (e.g. measurement errors, maturation, time, etc.) to explain fluctuations in data.

**Intervention summary statistics.** Michael, the only student in the study who was identified with a learning disability, was observed to make gains within oral reading fluency. The percentage of non-overlapping data for Michael was found to be 87.5%. Michael’s data had an effect size of $d = 3.2$ for oral reading fluency. The student’s results in the area of comprehension are more difficult to interpret. The percentage of non-overlapping data for Michael was found to be 75%. While the student made gains during the first few weeks, his data were inconsistent and
a clear trend in data was not established. Michael’s comprehension data had an effect size of $d = 1.7$.

Karen also appears to have made gains in reading fluency and reading comprehension. The percentage of non-overlapping reading fluency data for Karen was found to be 100%. Karen oral reading fluency data had an effect size of $d = 3.3$. The percentage of non-overlapping reading comprehension data was 100%. Karen’s comprehension data had an effect size of $d = 3.0$.

Aaron demonstrated gains in reading fluency and reading comprehension. The percentage of non-overlapping reading fluency data for Aaron was found to be 100%. Aaron’s oral reading fluency data had an effect size of $d = 4.8$. The percentage of non-overlapping reading comprehension data was 75%. Aaron’s comprehension data had an effect size of $d = 2.4$.

Richard demonstrated gains in reading fluency and reading comprehension. The percentage of non-overlapping reading fluency data for Richard was found to be 100%. Richard’s reading fluency data had an effect size of $d = 3.4$. The percentage of non-overlapping reading comprehension data for Student 3 was found to be 63%. Richard’s comprehension data had an effect size of $d = 2.0$.

*Classwide reading outcomes.* Figures 3 and 4 display the classwide results in oral reading fluency and reading comprehension respectively as box plots of oral reading fluency and reading comprehension results. Since the intervention was administered classwide ($N = 16$ students; 1 student dropped out of study and no data from that student is included), progress was monitored for the entire class before tutoring began, after 4 weeks of tutoring, and after 8 weeks of tutoring. These data are displayed in the following box plots in order to look at the overall effects of small
group tutoring (including targeted students). The minimum scores on the box plots represent the 25\textsuperscript{th} percentile and the maximum scores represent the 75\textsuperscript{th} percentile. Based on visual analysis of the overall results for the class, it seems the class made progress in both reading fluency and reading comprehension skills. There appears to be more variation in scores on the comprehension measure than on the oral reading fluency measure based upon the large range of Figure 3. Classwide results in oral reading fluency

![Oral Reading Fluency: Whole Class](image)

Figure 4. Classwide results in reading comprehension.

![Reading Comprehension: Whole Class](image)
scores that exists. In oral reading fluency, the average score, after 4 weeks of intervention, was equivalent to the high score in baseline. Likewise the lowest scores in intervention were equivalent to the average scores during baseline. On average it appears that students met the 4th grade oral reading fluency goals of 118 correct words per minute. In reading comprehension, the average score after intervention was higher than the highest scores at baseline. The class average in reading comprehension decreased from midpoint assessments to final assessments, but was still higher than the goal and higher than baseline scores. The lowest scores in reading comprehension during intervention were relatively close to the average scores during baseline.

Reading comprehension scores displayed a larger range of scores during intervention than during baseline. On average it appears that students met the 4th grade reading comprehension goal of 20 correct answers.

Across both reading fluency and reading comprehension, greater gains were apparent after 4 weeks of intervention. After 8 weeks of intervention, it appears that most students maintained the levels that were reached after 4 weeks of intervention, but many students did not appear to make additional gains.

*Social Validity*

Results of the teacher surveys indicated that the teacher found the intervention acceptable, thought the intervention was effective in improving reading skills, and liked the procedures. The teacher rated the scripts as easy to follow and implement in her daily routine. She also noted that scripts helped her to carry out the intervention consistently. Significantly, the teacher decided to continue using the intervention after the 8-week study had ended with each group. She also asked for suggestions on how to incorporate this strategy into her daily routine with classroom novels and chapter books. The teacher commented on one survey item, “I am
impressed with the dramatic improvements that I have seen, using this intervention. This certainly fits into my daily routine, and made substantial changes in many students’ reading scores.” The teacher noted some potential negative side effects and reported that some students who struggle in reading may be embarrassed to work on their reading with peers.

Student surveys were also very positive (14 students returned completed surveys). Eighty-two percent of students reported liking the reading tutoring program at the conclusion of the study. Ninety-three percent of students indicated that they liked reading more now than they did before the program. Ninety-six percent of students thought the program made them better readers and 82% wished to continue the program. When asked about the length of the intervention, 57% of students wanted the program to be for more time, 36% wanted the program to last the same amount of time, and 7% wanted the program to last less time. Before the program began, 2 students expressed concerns on surveys that they might be made “fun of” for their reading. As mentioned in the Methods section, the teacher and researcher instructed students that this was a cooperative group and that any negative behavior would be corrected immediately and a behavior management system was used to reinforce positive behaviors. There were no teacher-reported incidences with children making fun of one another for their reading skills and no more comments regarding fear of teasing were found on any of the surveys. Upon further examination of the surveys, one student indicated that he/she didn’t like the program because he/she liked to read chapter books. Additionally, two students indicated that they didn’t like to read and found practicing boring, but both thought the program helped them to become better readers. Overall, most comments about the program were favorable. In fact, four students asked if the program would be available over the summer and indicated that they thought the program was fun and helped them to read more words more quickly.
Discussion

Based on the results, it appears that all four targeted students made reading gains. Cohen (1988) cautiously defined effect sizes as "small, \( d = .2 \), "medium, \( d = .5 \)," and "large, \( d = .8 \)." Based on this definition, all four students demonstrated very large effect sizes in both reading fluency and comprehension. Karen, Aaron, and Richard all met grade-level goals in reading fluency and comprehension. While Michael made gains, he did not meet grade-level goals and may benefit from additional intervention to address reading fluency and reading comprehension difficulties. Therefore it is consistent with the data that Michael was identified with a learning disability in the year in which the study took place.

It has been suggested (e.g., Scruggs & Mastropieri, 1998) that PND scores above 90 represent very effective treatments, scores from 70 to 90 represent effective treatments, scores from 50 to 70 are questionable, and scores below 50 are ineffective. Based on these suggestions, it would appear that the intervention was “very effective” for Karen, Aaron, and Richard in oral reading fluency and “effective” for Michael. In comprehension, it would appear that the intervention was “very effective” for Karen, “effective” for Michael and Aaron, and “questionable” for Richard.

Based on the DC and CDC interpretation (Fisher, et al., 2003), all four students benefited from the program in oral reading fluency and 2/4 students benefited from the program in reading comprehension. The DC and CDC methods require that 7/8 intervention points be above both the baseline mean line and baseline trend line in order for an effect to be noted. All of the students met these criteria in oral reading fluency and 2/4 met the criteria reading comprehension based on the DC and CDC methods. This provides more evidence of internal validity.
Likewise, high adherence to procedures gives further support for internal validity of the findings. At the same time, measurement error that is the result of differences in the passages presented to students may have increased intrasubject variability in data.

Advantages and Limitations

This study appears to provide some support for group-administered repeated reading practices among peers for increasing performance level in reading. The teacher noted advantages for this instructional procedure with groups of students rather than pairs of students because she believed it saved her time in monitoring students. Both the teacher and students rated the intervention favorably in terms of effectiveness, acceptability, and feasibility. Perhaps the most impressive evidence for this is that the class chose to continue to participate with the intervention even after the study had ended. An important finding for teachers was that when students worked in groups, they naturally assigned themselves roles (e.g. one student kept the log, another student watched the time, another student logged errors, etc.). This may be another advantage to group work in that it saves students time and provides students with a sense of responsibility within their group. Another notable finding was that the students became self-reliant and the teacher was not required to tell students to retrieve their folders. In fact, some students asked if they could start their own timers. There are inherent advantages in having students gain this independence.

On the other hand, some limitations were noted. Repeated reading interventions are carried out a number of different ways. Some use performance criterions and others use a specified number of repetitions when determining when to advance to a new passage. Since three repetitions were already being used in carrying out repeated reading interventions at the school, this method was continued in this study. Therefore, a potential limitation of this study was the
lack of a performance criterion (e.g. reading 110 cwpm during repeated reading trials before advancing to the next passage) which is sometimes recommended when using repeated reading interventions. However, Weinstein and Cook (1992) did not find significant difference between fixed-rate criterion (90 WPM-C) and three consecutive fluency improvements for increasing fluency. Another potential limitation of this study was the stimulus or conditions sampling. For example, it is not clear whether results might be different if another peer had taken part, or other materials were used, and so on. The specific variables that were present in the study, such as the assessments and student selection characteristics, limit the generalizability of the findings. Furthermore, although group compositions were mixed, they could have been mixed differently and this may have led to different results. In addition, stimulus or conditions sampling was narrow (e.g. selection of content, selection of peer tutors, selection of teacher). A different limitation to the study was the use of practiced passages versus unpracticed passages when assessing fluency and comprehension gains. Additionally, assessments were administered at the end of the third intervention session each week. These last two methodological decisions also limit the generalizability of the findings. All of these limitations may affect outcomes. Therefore it is important that future researchers replicate the results of the study with different populations, assessment tools, etc. Likewise, future researchers may wish to assign peers roles within the group and allow students the opportunity for more independence with group procedures. Future researcher and teachers are cautioned to be vigilant with students to assure that students do not make fun of one another for skill deficits. While, this did not happen in this study, certain steps were taken to help prevent this problem (see Methods). Being made teased was a real concern since two students and the teacher indicated fear of this in their social validity surveys.
Furthermore, it is important to monitor students closely to assure that students are practicing correctly.

**Conclusions**

While it is important to replicate these findings in future studies, it appears that repeated reading interventions that are delivered using a small group approach are effective in improving reading performance. For all four targeted students, level changes replicated, arguing for internal validity for the intervention. There were few instances of overlapping data points, and only two instances of loss of experimental control (Michael and Aaron, Comprehension). Based on interpretation results using the DC and CDC methods (Fisher, et al., 2003), it appears that the program was effective for all students in oral reading fluency and half of the students in reading comprehension. Teachers may decide to supplement repeated reading strategies with other explicit comprehension strategies (e.g. summarization, question generation, previewing texts) in order to address additional reading comprehension difficulties (National Institute of Child Health and Human Development, 2000). Additional data may be required in order to establish interpretable trends. It is possible that these data support a functional performance hypothesis and demonstrates that skill deficits are harder to change. This research took place as a Tier 1 (classwide) intervention so ruling out performance deficits was not a consideration. Future researchers could replicate these findings at a Tier 2 (targeted, small-group interventions) or Tier 3 (individualized interventions) level in which performance deficits would be ruled out. Furthermore, it would be advantageous to extend data collection in order to evaluate trends. This research provides some support for interventions that take place for a fixed length of time. This finding may be important given the recent school reforms (e.g. RTI).
References


Devault, R., & Joseph, L. M. (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
### Training Script

Student Names: __________________________________________ Date: ________

Time (Begin):_________ Time (End):_________

Passage: __________________________________________

---

<table>
<thead>
<tr>
<th>Training Script</th>
<th>DAY 1: MODEL ENTIRE PROCESS AND FOCUS ON LISTENER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP:</strong></td>
<td><strong>COMPLETED? (circle one)</strong></td>
</tr>
<tr>
<td>1. Prepare the Practice Passage</td>
<td></td>
</tr>
<tr>
<td>• A practice passage will be provided to you</td>
<td>YES NO</td>
</tr>
<tr>
<td>• Make an overhead of the selected passage (to demonstrate procedures).</td>
<td></td>
</tr>
<tr>
<td>2. Introduce the concept of fluency.</td>
<td></td>
</tr>
<tr>
<td>• State that, “We are going to be working on our reading fluency. Fluency means how fast and accurately we read. One way to increase fluency is by rereading. The more we practice reading, the better we become at it.”</td>
<td>YES NO</td>
</tr>
<tr>
<td>3. Model the reading fluency procedure</td>
<td></td>
</tr>
<tr>
<td>• Place the transparency of the practice passage on the overhead and ask for 2 student volunteers to work with you.</td>
<td>YES NO</td>
</tr>
<tr>
<td>• Tell the students that they will be working in groups of 4 students. Student 1 will read first while Students 2, 3, and 4 follow along tracking each word with their finger.</td>
<td></td>
</tr>
<tr>
<td>4. Model the reading fluency procedure</td>
<td></td>
</tr>
<tr>
<td>• Tell the students that you will be Student 2 and that your job right now is to listen as Student 1 reads.</td>
<td></td>
</tr>
<tr>
<td>• Tell the students that Student 1 will be the first reader. Instruct Student 1 to deliberately say the wrong word, skip a word, and hesitate on a word.</td>
<td></td>
</tr>
<tr>
<td>• Instruct the other students to follow along with their fingers.</td>
<td></td>
</tr>
<tr>
<td>• Say to the class, “Watch me and the other students as Student 1 reads the practice passage to me. Notice what I say when the reader makes an error and notice that</td>
<td></td>
</tr>
</tbody>
</table>

---

66
I track each word with my pen/finger.

5. Model the reading fluency procedure
   - Tell Student 1 to read the first paragraph. Use the correction procedure when the reader makes an error:
     - If the reader reads a wrong word, skips a word, or doesn’t know a word.
     - Stop the reader and point to the word
     - Say the word
     - Have the reader repeat the word
     - Have the reader continue reading
   - Ask the class, “What did you observe me and the other listeners doing when Student 1 was reading the passage to me?”

The most important behavior you want students to notice is how the pen “tracked” the words as the student was reading. Tracking helps students keep their place as they read and makes marking errors easier.

6. Students whisper-read the practice passage.
   - Say, “Now it is your turn to try it. You will be working in groups of 4 students. When I say begin Student 1 will whisper-read the passage. Student 2 be sure to use the correction procedure when the reader makes a mistake. After Student 1 has read, Student 2 will read and Student 3 will provide error correction. After Student 2 has read, Student 3 will read and Student 4 will provide error correction. Finally, Student 4 will read and Student 1 will provide error correction.” “Ready, begin.”
   - Walk around the room and monitor that students are reading and using the correction procedure. If students are not using the procedures, provide prompt to use the correction procedures.
   - Tell the students to stop after 5 minutes.

7. Tell students that the last step is to complete their log and script. Demonstrate how to

   YES | NO
complete log and script using overhead transparencies. Tell students that the group will be responsible for getting logs and scripts completed each day.

- **SCRIPT**: “Each student will be assigned a number (Student 1, Student 2, Student 3, or Student 4). Each day you will put your name next to your student number at the top of the page and on the lines for each step. After you have completed each step, you will place a checkmark in the box.”

- **LOG**: “You will write your name next to your student number. You will record the date, the time that we start practicing, and the time that we end practicing. You will also record the number that is written on the top of the passage and the number of times your group read the passage. When someone in your group makes an error, the listener will write the error in the box. At the end of our practice you will bring your logs to me and I will finish the last section.”

<table>
<thead>
<tr>
<th><strong>Training Script</strong></th>
<th>DAY 2: MODEL ENTIRE PROCESS: FOCUS ON READER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use the same passage and overhead.</td>
<td>YES</td>
</tr>
<tr>
<td>2. Model the fluency group procedure.</td>
<td>YES</td>
</tr>
<tr>
<td>- Place the transparency of the practice passage on the overhead and ask for 3 student volunteers.</td>
<td></td>
</tr>
<tr>
<td>- Instruct Student 2 to use the correction procedure when you make a mistake:</td>
<td></td>
</tr>
<tr>
<td>- If the reader reads a wrong word, skips a word, or doesn’t know a word.</td>
<td>YES</td>
</tr>
<tr>
<td>- Stop the reader and point to the word</td>
<td></td>
</tr>
<tr>
<td>- Say the word</td>
<td></td>
</tr>
<tr>
<td>- Have the reader repeat the word</td>
<td></td>
</tr>
<tr>
<td>- Have the reader continue reading</td>
<td></td>
</tr>
<tr>
<td>- Say to the class, “Watch me as I read the passage. Notice that I am reading</td>
<td></td>
</tr>
</tbody>
</table>
carefully and tracking the words as I read.”
- Read the first paragraph using your finger/pen to track the words
- Deliberately read a wrong word, skip a word, or hesitate on a word.

3. Review with class.
- Ask the class, “What did you observe me doing when I was reading the passage?”
- The most important behavior you want students to notice is how you “tracked” the words as you read. Tracking helps students keep their place as they read and makes marking errors easier.
- Review the procedure for correcting errors.
  - If the reader reads a wrong word, skips a word, or doesn’t know a word.
  - Stop the reader and point to the word
  - Say the word
  - Have the reader repeat the word
  - Have the reader continue reading

4. Students whisper-read the practice passage.
- Say, “Now it is your turn to try it. You will be working in groups of 4 students. When I say begin Student 1 will whisper-read the passage. Student 2 be sure to use the correction procedure when the reader makes a mistake. After Student 1 has read, Student 2 will read and Student 3 will provide error correction. After Student 2 has read, Student 3 will read and Student 4 will provide error correction. Finally, Student 4 will read and Student 1 will provide error correction” “Ready, begin.”
- Walk around the room and monitor that students are reading and using the correction procedure. If students are not using the correction procedure prompt the students to follow the steps.
- Tell the students to stop after 5-minutes.
5. Tell students that the last step is to complete their log and script. Demonstrate how to complete log and script using overhead transparencies.

- **SCRIPT:** “Each student will be assigned a number (Student 1, Student 2, Student 3, or Student 4). Each day you will put your name next to your student number at the top of the page and on the lines for each step. After you have completed each step, you will place a checkmark in the box.”
- **LOG:** “You will write your name next to your student number. You will record the date, the time that we start practicing, and the time that we end practicing. You will also record the number that is written on the top of the passage and the number of times your group read the passage. When someone in your group makes an error, the listener will write the error in the box. At the end of our practice you will bring your logs to me and I will finish the last section.”

<table>
<thead>
<tr>
<th>Training Script</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Day 3: Independent Practice to Mastery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Discuss cooperative partnerships.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Say, “We will be working as a small group for 10 minutes each day.”</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>- Tell them that their groups are working relationships and not necessarily friendships. Tell them that you selected the fluency groups.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Tell them that groups will not practice at the same time at first. Group 1 will be the first group to start. While Group 1 is doing the small group tutoring, Groups 2 and 3 will be reading silently from their novel for 10 minutes. Tell them that you will review the steps and announce later when the other groups will begin.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Assign groups and student numbers.</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>- Groups will be created with the school psychologist and students targeted for the</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
study will be assigned to one of the 3 groups.

- Announce fluency groups and name one student as Student 1, one as Student 2, one as Student 3, and one as Student 4. (Student 1 is the strongest reader, but do not share this information with students). Simply state that Student 1 always reads first.
- Tell students where they will sit for fluency practices (e.g. in a circle).
- Set rules about noise levels expected during fluency practice (e.g. inside voices, whisper-reading, etc.)

3. Explain procedures.

- Inform class as to where the practice passages and folders will be stored.
- Tell students that they will take turns reading paragraphs for 10 minutes.
- Remind students of error correction procedure:
  o If the reader reads a wrong word, skips a word, or doesn’t know a word.
  o Stop the reader and point to the word
  o Say the word
  o Have the reader repeat the word
  o Have the reader continue reading
- Tell students that they will read the same passage at least 3 times.
- Tell students that they will complete a log when they are finished.

4. Have students practice together.

- Detail procedures for students: Student 1 always reads first which means Student 2 is using the correction procedure first. Student 2 reads next and Student 3 provides error correction. Student 3 reads next and Student 4 provides error correction. Student 4 reads and Student 1 provides error correction.
- Ask the class if they have any questions, if there are no questions, set the timer for
10 minutes. Announce, “Please Begin.”
- Using the “Group Practice Script” go around to each group of students and place a checkmark in the box if students completed the step accurately.
- Practice will continue until each group of students achieves 100% accuracy carrying out the steps.
- When the time is up say “Stop.”

5. Review how to complete log and script (use overhead transparencies) and teach students to return materials to a designated location
- SCRIPT: Each student will be assigned a number (Student 1, Student 2, Student 3, or Student 4). Each day you will put your name next to your student number at the top of the page and on the lines for each step. After you have completed each step, you will place a checkmark in the box.
- LOG: “You will write your name next to your student number. You will record the date, the time that we start practicing, and the time that we end practicing. You will also record the number that is written on the top of the passage and the number of times your group read the passage. When someone in your group makes an error, the listener will write the error in the box. At the end of our practice you will bring your logs to me and I will finish the last section.”
- Explain that each week they will practice a new passage. Each passage has a number at the top. Each week you will exchange your old passage for the next passage (numerically).

6. Tell students that each week you and the school psychologist will be checking their skills to see if the group work is helping. Ask the students if they have any questions.
Appendix B

Group Practice Log

DIRECTIONS: Please complete the following and turn into your teacher when you are finished.

Student 1: ___________________________________ Student 2: ___________________________________
Student 3: ___________________________________ Student 4: ___________________________________
Date: ____________________ Time (Begin):__________________ Time (End):__________________
Passage #:________________________________________ 
# Times Read: ________________________________________

DIRECTIONS: Please complete all the steps and write down any words that your group had difficulty reading in the box below.

Log of Errors:

To be completed by teacher:

Please indicate in the space below the number of minutes that you spent working directly with these students:

__________ minutes
Appendix C

Group Practice Script

**DATE:** __________

**STUDENT 1:** ___________________ **STUDENT 2:** ___________________

**STUDENT 3:** ___________________ **STUDENT 4:** ___________________

**STEPS:**

**DIRECTIONS:** Place a checkmark on the line after completing each step.

<table>
<thead>
<tr>
<th>Step</th>
<th>✔ Completed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Get your folder and begin to fill out log.</td>
<td></td>
</tr>
<tr>
<td>2. Student 1 ______________ reads 1 paragraph aloud from the novel while all students follow along silently.</td>
<td></td>
</tr>
<tr>
<td>3. Student 2______________ provides error correction while Student 1______________ reads.</td>
<td></td>
</tr>
<tr>
<td>4. Student 2 ______________ reads the next paragraph aloud while all students follow along silently.</td>
<td></td>
</tr>
<tr>
<td>5. Student 3______________ provides error correction while Student 2______________ reads.</td>
<td></td>
</tr>
<tr>
<td>6. Student 3______________ reads the next paragraph aloud while all students follow along silently.</td>
<td></td>
</tr>
<tr>
<td>7. Student 4______________ provides error correction while Student 3______________ reads.</td>
<td></td>
</tr>
<tr>
<td>8. Student 4______________ reads the next paragraph aloud while all students follow along silently.</td>
<td></td>
</tr>
<tr>
<td>9. Student 1______________ provides error correction while Student 4______________ reads.</td>
<td></td>
</tr>
<tr>
<td>10. If a group member reads the wrong word, skips a word, or doesn't know a word:</td>
<td></td>
</tr>
<tr>
<td>• Point to the word</td>
<td></td>
</tr>
<tr>
<td>• Say the word</td>
<td></td>
</tr>
<tr>
<td>• Have the reader repeat the word</td>
<td></td>
</tr>
<tr>
<td>• Tell the reader to continue reading</td>
<td></td>
</tr>
<tr>
<td>11. Repeat these steps for 10 minutes (Be sure you have read the passage at least 3 times).</td>
<td></td>
</tr>
</tbody>
</table>
Appendix D

Teacher Checklist

Date: ___________

DIRECTIONS: Place a check on the line after completing each step.

1. Announce that the fluency timings are to begin.
   - Groups retrieve folders
   - Groups begin to complete log

2. Set the timer for 10 minutes and say, “Begin.”
   - Students alternate reading paragraphs
   - Students not reading should be tracking words with their fingers
   - The student who will read next uses error correction procedure if mistakes are made
   - Students return their folders with all materials to the designated place.

3. Monitor student groups for accuracy.
   - Walk around the room and using the “Group Practice Script” check to see that students in each group are taking turns reading, using the correction procedure, and completing checklists.
     - Place a checkmark next to each step of the “Group Practice Script” that students complete accurately.
   - If students are not carrying out the steps correctly, stop the students, review the steps, and have them continue.

4. Stop groups at the end of ten minutes and tell them to return their materials to the folders.

5. Tell students to turn their logs into you and log the amount of time you spent directly working with students on the student log.

6. Assess oral reading fluency for 4 students targeted for study.

7. Administer AIMSweb MAZE assessment with 4 targeted students.
# ’s Reading Scores

<table>
<thead>
<tr>
<th>Date/ Time</th>
<th>Practiced ORF Score</th>
<th>Practiced MAZE</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>
Appendix F: Script Acceptability Questionnaire

Script Acceptability Questionnaire

Purpose: The purpose of this questionnaire is to get your feedback about the *intervention script* developed by you and the school psychologist for ________________.

Directions: Please circle the number which best describes your agreement or disagreement with each of the following statements about the *intervention script*. Please answer all questions even if you are unsure of your response.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The script is easy to follow.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. The script is easy to include in my daily routine.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. The script helps me carry out the intervention consistently.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. The script deals effectively with the reading problem.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5. The time developing the script was worthwhile.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. Scripts would be helpful for other problem situations.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

(adapted from Erhardt et al., 1996)

Comments:

Teacher initials: __________________ Consultant initials: __________________
Appendix G: Intervention Rating Profile-15

Purpose: The purpose of this questionnaire is to get your feedback about the **intervention** developed by you and the school psychologist for ________________.

Directions: Please circle the number which best describes your agreement or disagreement with each of the following statements about the **intervention**. Please answer all questions even if you are unsure of your response.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This is an acceptable intervention for the child’s reading difficulties.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. Most teachers would find this intervention appropriate for addressing reading difficulties.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. This intervention should prove effective in improving the child’s Reading.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. I would suggest the use of this intervention to other teachers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. Most teachers would find this intervention suitable for the Reading problem identified.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7. I would be willing to use this intervention in the classroom setting.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8. This intervention would not result in negative side-effects for the child.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9. This intervention would be appropriate for a variety of children.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10. This intervention is consistent with those I have used in classroom settings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>11. The intervention is a fair way to handle the child’s reading difficulties.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>12. This intervention is reasonable for the reading problem identified.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>13. I like the procedures used in this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>14. This intervention is a good way to handle this child’s reading problems.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>15. Overall, this intervention would be beneficial for the child.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

(Adapted from Witt & Martens, 1983)

Teacher initials: ___________________________  Consultant initials: ___________________________
Appendix H: Social Validity Questionnaires for Participants

Child Questionnaire 1
Reading Tutoring

*Please answer these questions with “yes” or “no.”*

1. Do you want to become a better reader? __________

2. Do you think practicing might help? __________
   
   If not, why not?

3. Do you think the tutoring program might help make you a better reader? __________
   
   If not, why not?

4. Do you think it would help to practice reading with other students? __________
   
   If not, why not?

5. Would you like to practice reading with other students? __________
   
   If not, why not?

6. Would you like to practice reading after-school? __________
   
   If not, why not?

Anything else you’d like to say about the tutoring program?
Child Questionnaire 2
Reading Tutoring

Please answer these questions with “yes” or “no.”

1. Do you like the reading tutoring program? ___________
   If not, why not?

2. Do you like to read more now than before this program? ___________
   If not, why not?

3. Do you think the program makes you a better reader? ___________
   If not, why not?

4. Do you like spending time practicing your reading? ___________
   If not, why not?

5. If you were to take part in this program again, would you want it to be for (circle one):
   the same amount of time     more time     less time

Anything else you’d like to say about the reading tutoring program?
Child Questionnaire 3
Reading Tutoring

Please answer these questions.

1. Did you like the reading tutoring program? _________
   If not, why not?

2. Do you like to read more now than before this program? _________
   If not, why not?

3. Do you think the program made you a better reader? _________
   If not, why not?

4. Would you like to continue the program? _________
   If not, why not?

5. If you were to take part in this program again, would you want it to be for (circle one):
   the same amount of time       more time       less time

Anything else you’d like to say about the reading tutoring program?
Appendix I: DC and CDC Graphs

Michael: ORF (DC)

Karen: ORF (DC)