

Increasing Elementary-aged Students' Reading Fluency with Small-group Interventions: A Comparison of Repeated Reading, Listening Passage Preview, and Listening Only Strategies

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Abstract Although reading fluency is one of the five essential early-reading skills students must develop, many elementary-aged students in the United States do not read age-appropriate material fluently. As such, small-group interventions are practical and often more time efficient than individualized interventions aimed to address this problem. However, few small-group interventions targeting students' reading fluency have been empirically evaluated. The primary purpose of this study was to examine three small-group reading interventions that have been used to improve students' reading fluency (repeated reading, listening passage preview, and listening only). Using an alternating-treatments design, the effects of each intervention were evaluated with four-second-grade students with average to below average reading skills. Students' words read correctly per minute (immediately following and 2 days after intervention) served as the outcome measures. Results supported the repeated reading intervention, followed by listening passage preview, as most effective. Findings also suggested that improvements from each intervention remained 2 days later.

Keywords Reading intervention · Small-group · Reading fluency

Introduction

Over the past two decades, a substantial amount of research has been conducted in the area of reading. As a result, many reading researchers agree that the essential components of early elementary reading instruction should target phonics, phonemic awareness, fluency, comprehension, and vocabulary (Armbruster et al. 2001;

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National Reading Panel (NRP 2000). Yet, in spite of the advances in knowledge about effective reading instruction, a large number of US students still experience great difficulties learning to read (Lee et al. 2007).

In the area of reading fluency (commonly defined as a student's ability to read with speed, accuracy, and proper expression), a recent nationally representative study of 1,779 fourth-grade students suggests that 40% of US students are "nonfluent" readers (Daane et al. 2005). Other important findings from this study revealed a strong correlation between reading fluency and comprehension, as well as a strong correlation between reading fluency and students' overall reading ability. Collectively, findings from Daane et al. reiterate the importance of reading fluency that was previously highlighted by other reading researchers (e.g., Fuchs et al. 2001) and suggest that almost half of US students would probably benefit from interventions aimed to improve their reading fluency.

Several studies over the past 25 years have described effective strategies for increasing students' reading fluency, and in many of these studies, fluency-based strategies have also enhanced other important reading abilities, including comprehension (e.g., NRP 2000). Of the various reading fluency interventions reported, repeated reading (RR) and passage previewing (PP) strategies have been examined most often (Skinner et al. 1997; Therrien 2004).

Repeated reading involves having a student re-read a short passage 2 or more times, sometimes reading the passage until a suitable reading fluency level (i.e., criterion) is met (Therrien 2004). Recent meta-analyses (Chard et al. 2002; NRP 2000; Therrien 2004) have illustrated the positive outcomes of using RR procedures. For example, Chard et al. (2002) examined the effects of 24 studies that addressed components of reading interventions and found that RR was associated with significant improvements in reading fluency and comprehension for students with learning disabilities. More recently, Therrien (2004) confirmed the effectiveness of RR procedures for improving various types of reading abilities and, in addition, found that these effects are enhanced when the strategy is implemented with adults rather than peers.

Passage previewing—occasionally referred to as *modeling*—is another intervention commonly used to increase students' reading fluency. The research literature highlights three basic types of PP interventions: (a) silent PP, where the student reads the passage silently prior to instruction and/or testing; (b) oral PP, where the student reads the passage aloud prior to instruction and/or testing; and (c) listening PP (LPP), where the student listens to a more skilled reader read the passage (e.g., a teacher, parent, more skilled peer, an audiotope) while following along silently. The efficacy of PP procedures on students' reading fluency has also been well documented, with LPP generally receiving the most support over other types of PP interventions (Daly and Martens 1994; Skinner et al. 1997).

As another strategy to potentially improve reading fluency, Clarke-Stewart (1998) and Kuhn (2005) evaluated whether students' fluency would improve simply by listening to a more skilled reader (e.g., a teacher) read a story aloud—a strategy commonly used in elementary classrooms. In the research literature, this procedure is often referred to as "reading aloud." For the purposes of this paper, we will henceforth refer to this type of instruction as listening only (LO) because a primary

purpose of our report is to examine interventions based upon student (rather than teacher) behavior. Also note that LO differs from LPP because LPP involves the student both listening *and* reading the story silently; with LO, the student simply listens as a story is read aloud by a more skilled reader. We were interested in evaluating the LO procedure in this study because (a) it is commonly used as a group-based instructional procedure in elementary classrooms (though not typically intended as a strategy to improve students' reading fluency), (b) this procedure has not been sufficiently examined with respect to its effect on students' reading fluency, and (c) knowing the relative effectiveness of LO compared to more common reading fluency interventions (e.g., RR and LPP) has instructional implications for educators.

The research on LO procedures is generally dichotomized into studies that examine the effects of LO at home (when implemented by parents) and at school (when implemented by teachers), with parent-based LO practices more commonly reported. Meta-analyses from the parent-based LO studies suggest that LO has a small to medium effect on language growth, emergent literacy, and reading achievement (Bus et al. 1995; Scarborough and Dobrich 1994). In the only known parent-based LO study evaluating the procedures on students' reading fluency, Clarke-Stewart (1998) found that third-grade students significantly increased their reading fluency (and comprehension) by listening to stories read by their parents. However, greater reading fluency gains were reported when children read stories *with* their parents.

According to Teale (2003), “the body of research on the effects of classroom read-alouds is perhaps not as robust as that on parent-child activity” (p. 121), and findings in this area of research have been mixed. For example, Meyer et al. (1994) found negative correlations between the amount of time teachers spent reading books aloud to children and children's reading achievement. Other studies have shown teacher-based LO to positively affect decoding, reading comprehension, story telling, and vocabulary (Elley 1989; Rosenhouse et al. 1997). In the area of reading fluency, we located only one teacher-based LO study. In this study, Kuhn (2005) found that students receiving RR or non-repetitive reading made greater gains in word recognition and reading fluency than students in the LO and control groups, and the LO group was not significantly different from the control group in these reading measures. Unfortunately, a notable limitation of this study was that there were only six students in each of the four groups.

As described above, LO procedures can be easily implemented with groups of students, which may be considered by many educators as an advantage over other types of reading interventions that are employed with only one student at a time (Rashotte et al. 2001; Witt et al. 1984). In fact, despite the number of studies that have demonstrated the efficacy of RR and LPP, a limitation of this research base is that the large majority of these interventions have been implemented by having students work one-on-one with a peer or adult (Chard et al. 2002; Therrien 2004), thereby making these strategies potentially more time consuming (and presumably less feasible) for elementary school teachers.

In recent years, however, attempts have been made to develop and empirically evaluate small-group interventions targeting reading fluency (e.g., Kuhn 2005;

McCurdy et al. 2007; Wolf and Katzir-Cohen 2001), including studies that have modified typical RR and LPP strategies so they can be used with small groups of ~4–6 students (e.g., Begeny and Martens 2006; Begeny and Silber 2006). Begeny and Silber (2006) studied the effects of various small-group intervention packages on reading fluency. Participants included four, third-grade students who had been identified by their teachers as needing additional reading assistance. Using an alternating-treatments design, Begeny and Silber examined four intervention packages, each of which comprised a different combination of RR, LPP and word-list training (WLT; when prompted by the trainer, students chorally responded to difficult words from the stories) procedures. A control condition was also used to assess the effectiveness of each intervention against a no-treatment control. The primary findings from this study revealed that each of the intervention packages promoted larger reading fluency gains compared to the control condition, but the WLT + LPP + RR intervention was most effective upon evaluation immediately following intervention and evaluation that occurred ~2 days later (i.e., retention gains).

Although Begeny and Silber (2006) extended the relatively small literature base on small-group interventions designed to improve students' reading fluency, there were two important limitations to this study. First, the study sought to combine multiple intervention strategies, making it unclear which of the small-group strategies actually improved students' reading fluency. Second, the RR strategies were implemented within the *context* of a small-group intervention, but the specific RR intervention was implemented in peer dyads, thereby making this intervention component closer in resemblance to a peer-tutoring intervention (Mathes and Fuchs 1994) rather than a RR intervention implemented by a teacher with a small group of students.

To address these limitations and extend the relatively small research base examining different small-group interventions targeting students' reading fluency, the purpose of the present study was to examine the impact of small-group RR, LPP, and LO strategies on students' reading fluency when implemented in isolation from other instructionally based intervention strategies. Additionally, we offer some initial investigations into the ways in which the RR, LPP, and LO interventions are implemented and measured. For example, we (a) modified the small-group RR procedure so that it can truly be implemented by one adult with a small group of students (rather than structuring the procedure in peer dyads), (b) included a procedure uncommonly used with LPP to better gauge (and potentially improve) students' on-task behavior during this intervention, and (c) conducted one of only two known comparative investigations of the LO procedure by evaluating its effectiveness against fluency-based reading interventions (i.e., RR and LPP).

In summary, the primary goal of this study was to evaluate the effects of small-group RR, LPP, and LO interventions on students' reading fluency. In addressing this goal, we also considered (a) immediate and retention effects of the interventions, and (b) the relatively novel implementation of the three intervention conditions. Because experimental intervention studies are rarely reported in educational journals (e.g., Bliss et al. 2008) and because of the increased use of response-to-intervention (RtI) models within schools, we aimed to evaluate

small-group interventions that can be easily implemented by educators, potentially within the context of an RtI model.

Methods

Participants and Setting

Student Participants

Participants included four-second-grade students from one rural school in the Southeast. These students (Kisha, Lara, Antonio, and Andrew) were randomly selected for this study among a list of several students that teachers identified as needing additional reading assistance. Of the four participants, two were female, two were African-American, one was Hispanic, and one was Caucasian. None of the students received English as Second Language services. Students' average age was 8.1 years (range = 7.58–8.67). Due to state and county regulations at the time of the study, additional student demographic information (e.g., eligibility for free or reduced lunch, presence of an educational and/or psychological disability) could not be obtained.

Student participants met screening criteria during a winter assessment that occurred just prior to the start of the intervention. First, as indicated by reading fluency assessment procedures and instructional placement standards reported by Hasbrouck and Tindal (2006), all participants read between the 25th and 50th percentile (range: 46–56.5 words read correct per minute). Also, students earned a standard score in the Below Average (80–89) or Average (90–109) range on the Test of Word Reading Efficiency, the Basic Reading Skills composite on the Woodcock–Johnson tests of achievement (third edition), and the rapid naming composite of the comprehensive test of phonological processing. Students' composite scores on these screening measures were required to be above 70, because students reading two standard deviations below the mean on these measures would not be as likely to benefit from the type of fluency-based reading interventions implemented in this study. For example, students may require more intensive instruction in decoding and/or rapid naming if basic word reading and/or processing abilities are substantially below age-level. All intervention procedures were conducted in a small classroom in the participants' school. During experimental procedures, only study participants and experimenters were in the classroom in order to reduce noise and distractions.

Trainers/Experimenters

Throughout the course of the study, the *intervention components* were implemented by three doctoral students in school psychology (henceforth referred to as “trainers” due to their specific involvement with intervention implementation). One of three trainers served as the sole trainer during each intervention session, with each trainer implementing the intervention components for approximately one-third of the total

number of intervention sessions. Three undergraduate psychology majors were also involved as experimenters. Experimenters evaluated intervention effects immediately after intervention sessions and 2 days later using curriculum-based measurement (CBM) procedures (Shinn 1989). All trainers and experimenters were instructed on relevant procedural roles and were required to demonstrate mastery criterion (100% correct implementation) prior to implementing intervention and assessment procedures.

Materials

Oral Reading Fluency Intervention Reading Probes

Reading probes used during intervention sessions and for ongoing assessment of participants' performance were developed from first, second, and third grade Dynamic Indicators of Basic Early Literacy Skills™ 6th Edition (DIBELS™; Good and Kaminski 2002) progress monitoring materials. Specifically, the first 115–130 words from 48 separate DIBELS progress monitoring passages were prepared in the standard format for reading fluency passages. The passages chosen were at the second-grade reading level or slightly above according to the Spache (1953) readability formula. Readability levels ranged from 2.37 to 3.51, with an average readability of 2.96 (SD = 0.34). This level of passage difficulty was purposefully selected so that materials would be at and slightly above students' reading level, which is a common procedure for reading fluency intervention studies (e.g., Begeny and Silber 2006). All oral reading fluency (ORF) intervention probes were administered according to the CBM directions outlined by Shinn (1989). Participants had not previously read any of the passages prior to this study.

Experimental Design

An alternating-treatments design was used to evaluate the effectiveness of the three different intervention conditions, and a control condition (CL) was used to evaluate the effectiveness of each condition versus a no-instructional intervention condition. Participants received four separate sessions of each of the four conditions (16 sessions total). Students were grouped together and thus received intervention conditions simultaneously. The order of conditions was partly counterbalanced so that each condition would occur at least once in the beginning, middle, and end of the study.

To equate for passage difficulty across each of the four conditions, all conditions utilized passages with comparable readability levels. Based upon the Spache (1953) readability formula, the average readability level across all passages from each condition was as follows: CL = 3.01; LPP = 2.91; RR = 2.95, and LO = 2.97. For each session, intervention procedures were implemented on three passages (henceforth described as passages A, B, and C) because (a) readability levels do not always depict passage difficulty level accurately (Ardoin et al. 2005) and (b) the median score from three reading fluency assessments provides a more accurate estimate of a student's true reading fluency (Good and Kaminski 2002). The median

words correct per minute (WCPM) of passages A, B, and C of a given session constituted the student's overall WCPM reading score for that session.

Procedures

There were several procedural consistencies across all conditions (including the control condition). The similarities across conditions are described first, followed by a description of the procedures specific to each condition.

Across all conditions, the trainer greeted the group of students by saying, "Today we are going to read some stories together. When you read the stories, I want you to give your best effort! At the end of our time together today, if everybody shows that they put in their best effort and followed my directions, you can earn up to two stars on your chart." During the very first session (and repeated in subsequent sessions as a reminder), the trainer showed students their "Star Chart" (henceforth referred to as the "chart"), explained thoroughly how the chart would be used (e.g., what the stars represented and how they would allow students to later earn a small prize), and then allowed students to view the possible prizes they could choose from after earning enough stars on their chart. During intervention conditions when students were required to engage in activities outside of reading the story aloud (i.e., listening and/or following along as the trainer read a story), students were also told that their effort in these activities was required to earn stars on their chart at the end of the session.

Each session ended by praising the students (as a group) for their effort and ability to follow directions, and telling them how many stars they earned on their chart (a maximum of two). The chart consisted of 15 boxes across a row. When the group received a star in the 15th box, they were each able to select a prize from the prize box (e.g., pencils, stickers, baseball cards). Subsequent stars the students earned were placed on the following row of the chart. Also, 2–3 shaded boxes were intermittently located on each row of the chart. When students earned a star on a shaded box, one student was able to select a ticket from the "Bonus Bag" for the rest of the team. Each ticket in the Bonus Bag listed a number of bonus or "free" stars the students could earn on their chart. Descriptions of bonus stars written on the tickets ranged from 1 to 5 bonus stars, with proportionately more tickets representing a smaller number of bonus stars (e.g., there were five "one bonus star" tickets, and only one "five bonus stars" ticket). There was also one ticket labeled "Prize Box." If this ticket was selected, all students would get to select a prize. Throughout the project, students demonstrated considerable effort and followed all directions across each of the conditions. Students therefore earned two stars on their chart after each session.

Assessment procedures were also consistent across each condition. The two types of assessment conditions (immediate and retention—both described below) were always conducted by having a student read one-on-one with an experimenter in an area free from noise and distractions. Retention assessments evaluated students' oral reading fluency of the three passages they read during the condition implemented in the previous session (~2 days earlier). Following the introductory greetings at the beginning of each session, each student worked one-on-one with an experimenter and was asked (using the CBM administration procedures noted above) to read the

three passages from the previous session. Sessions occurred approximately every other day (typically every Monday, Wednesday, and Friday morning, unless a school holiday or event prevented this schedule). For each condition there was an average of 2.0 (range = 1–4) days between students' first exposure to the stories and the retention assessment.

Immediate assessment evaluated the immediate effects of a given condition on students' oral reading fluency of the three passages read during that session. For purposes of clarity, immediate assessments are described within the context of each of the four conditions below. Excluding the time needed for immediate and retention assessments within a given session, the LPP, RR, and LO conditions each took ~10–11 min to complete, which allowed students exposure to three separate passages (i.e., passages A, B, and C).

Control

During the control (CL) condition, students simply read passages A, B, and C in consecutive order with an experimenter. Students had no additional exposure or practice with these passages until the retention assessment which occurred ~2 days later.

Listening Passage Preview

During listening passage preview (LPP), students were grouped together and the trainer began by reading scripted directions that explicitly instructed students what to do during the session. The trainer then read passage A twice. During each reading the trainer read with good expression and at a pace only slightly faster than students could read the story (~60–80 words per minute). Students held a copy of the passage and were instructed to read along silently as the trainer read, and they were asked to point to the words in the passage to demonstrate they were following along. In addition, the trainer stopped reading the story 5–7 times throughout the reading and selected a student in the group to say the next word in the story.

Immediately after the trainer read passage A for the second time, each student was taken to separate location free from noise and distractions from other students. Using CBM administrative and scoring procedures (Shinn 1989) experimenters had students read passage A. This reading represented the immediate assessment, as it evaluated students' reading fluency of a practiced passage immediately following practice. The LPP and immediate assessment procedures were then implemented with passage B, followed by implementation on passage C.

Repeated Readings

During RR, students were grouped together and the trainer began by reading scripted directions that explicitly instructed students what to do during the session. The trainer then randomly selected one student from the group to serve as the "group leader." This student read passage A aloud while the other students read along, reading only slightly softer than the group leader. If the group leader came to

a word s/he did not know, the trainer provided the word aloud for the group. After the group finished reading the story aloud, a different group leader was selected and the same process was repeated with passage A. Following this second reading, the immediate assessment was conducted in an identical fashion to the LPP condition. After experimenters conducted the immediate assessment on passage A with students individually, RR procedures were implemented by the trainer on passage B followed by an immediate assessment on passage B. Procedures were then repeated with passage C.

Listening Only

As with the LPP and RR procedures, the LO condition began by grouping students together and reading the scripted instructions. The trainer instructed students to listen carefully and then read passage A aloud to the students twice. Unlike the LPP condition, students did not have access to the passage while the trainer read it aloud. After the passage was read twice, an immediate assessment was conducted with each student independently by an experimenter. LO and immediate assessment procedures were then repeated for passage B, followed by passage C.

Procedural Integrity

To measure procedural integrity, each trainer's implementation of the intervention was observed on 50% of the sessions. The protocols developed for training were also used in the assessment of procedural integrity. The trainers assessing procedural integrity stood in the hallway just outside the classroom door so that they could see and hear the intervention taking place but could not be seen by the students. Procedural integrity was 100% across trainers.

Results

To examine the relative effectiveness of the four conditions, median WCPM scores were derived from passages A, B, and C for each of the 16 sessions implemented in this study. Figure 1 depicts each student's immediate median WCPM scores across each of the 16 sessions. Across students there are several consistent data patterns. First, there is a relatively stable trend line across conditions. Second, the majority of intervention data points exceed all CL data points. More specifically, for Kisha and Andrew all intervention data points exceed CL data points. For Lara and Antonio, no more than two CL data points overlap with an intervention data point, and when overlap occurs, the magnitude is negligible and the overlap occurs most often with LO data. A final consistent pattern across students is that the majority of RR data points (at least three of the four RR data points) exceed all other intervention data points.

Figure 2 depicts each student's retention median WCPM scores across sessions. Again, there are relatively consistent data patterns across students. For instance, the

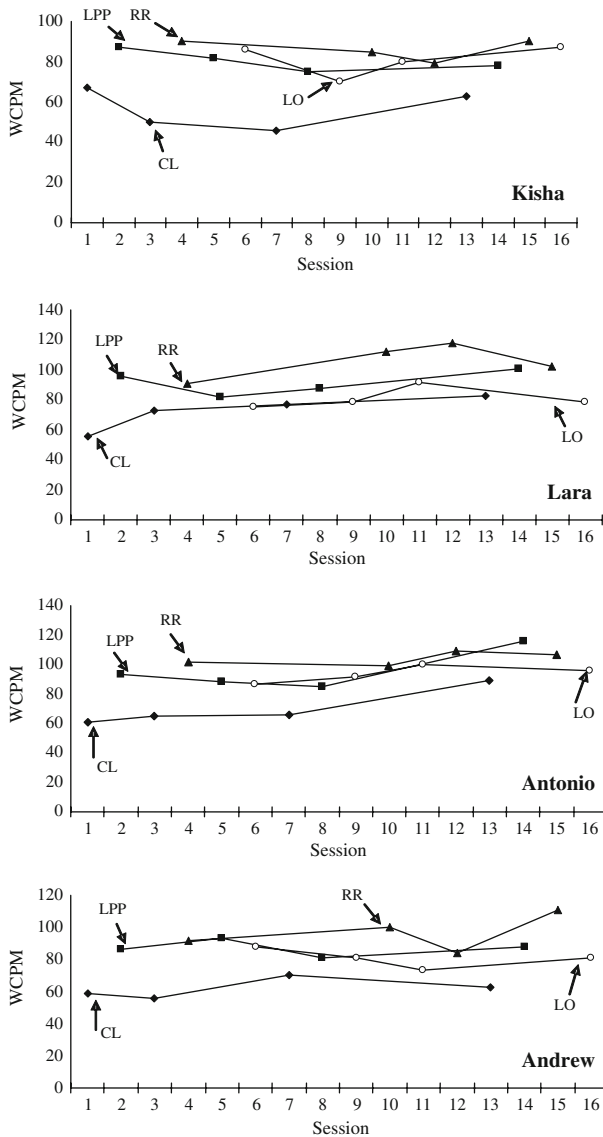


Fig. 1 Participants' immediate words read correct per minute (WCPM) scores for each condition

trend lines for most conditions are stable, though there are some exceptions with the CL data. In particular, the final data point for three of the students (Kisha, Lara, and Antonio) is higher than most other data points, which may reflect either an easier set of passages and/or a small effect related to student learning which may have occurred over the course of the study. Yet, despite this relatively higher CL data point for some students, each of the intervention data points across conditions and students rarely drop below CL data points, particularly for the RR and LPP conditions. As such,

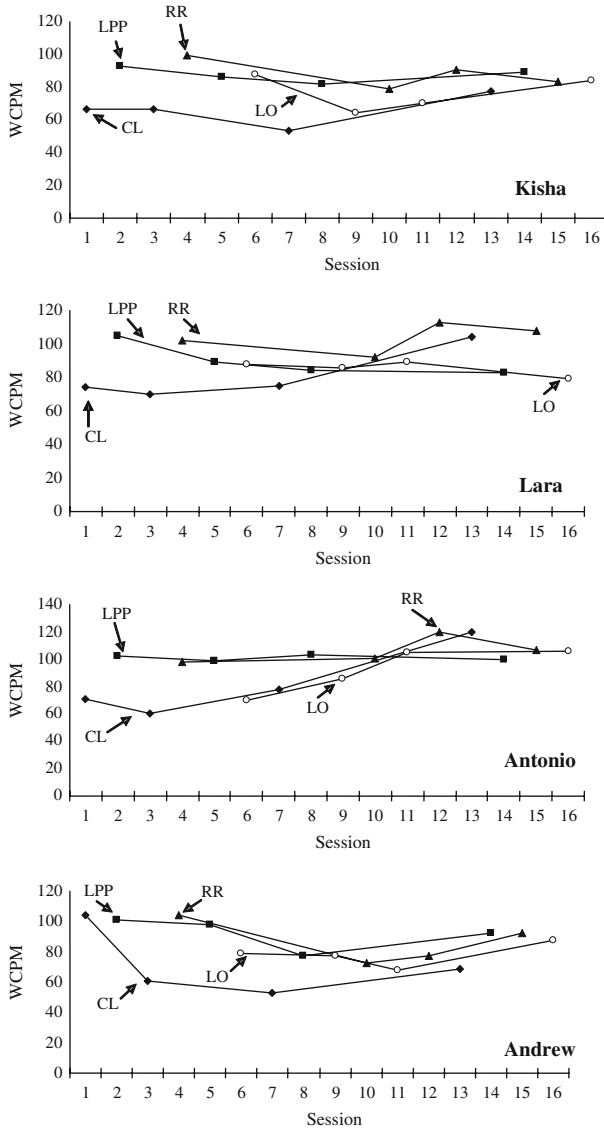


Fig. 2 Participants’ retention words read correct per minute (WCPM) scores for each condition

these data suggest that students generally retained the effects of each intervention ~2 days after receiving the intervention. Similar to the immediate gains displayed in Fig. 1, the RR retention data exceed the LO data points for all students, and generally exceed the LPP data points for Lara and Antonio. Also, the LPP data typically exceed the LO data for all students except Lara.

Table 1 provides the mean WCPM, standard deviations, and relative ranking across the conditions for each participant. For descriptive purposes, “first-ranked”

Table 1 Students' average words read correctly per minute (WCPM) across conditions

Student	Average score across each intervention implementation by condition: immediate gains				Average score across each intervention implementation by condition: retention gains			
	CL	LPP	RR	LO	CL	LPP	RR	LO
Kisha	56.50 (10.08)	80.50 (5.20)	86.00 (5.23)	80.75 (7.80)	65.25 (9.78)	87.50 (4.65)	90.00 (8.98)	79.25 (14.57)
Lara	72.25 (11.59)	91.75 (8.42)	105.75 (11.84)	81.25 (7.41)	80.75 (15.65)	90.25 (10.18)	103.75 (9.03)	85.50 (4.50)
Antonio	70.25 (12.69)	95.50 (14.06)	104.25 (4.57)	93.75 (5.56)	82.25 (26.23)	101.00 (1.83)	106.50 (9.75)	91.75 (17.17)
Andrew	62.00 (6.06)	87.00 (5.00)	96.75 (11.53)	80.75 (6.13)	71.75 (22.47)	91.50 (10.72)	86.50 (14.25)	78.00 (8.21)
Average across all students	65.25 (10.11)	88.69 (8.17)	98.19 (8.29)	84.13 (6.73)	75.00 (18.53)	92.56 (6.85)	96.69 (10.5)	83.63 (11.11)

Bolded values indicate the largest amount of gain for that student across conditions within each respective category of gain (immediate and retention)

Standard deviations are indicated in parentheses

CL control (no-instructional intervention) condition, LPP listening passage preview, RR repeated readings, LO listening only

refers to the condition in which the student demonstrated, on average, the greatest improvement. Similar to the data presented in Figs. 1 and 2, Table 1 shows that for each student the CL condition resulted in the least WCPM for both the immediate and retention measures. Furthermore, the difference between the average CL score and the average score for a student's first-ranked intervention is considerable, ranging from 29.5 to 34.75 WCPM for immediate effects and 19.75 to 24.75 WCPM for retention effects.

Data provided in Table 1 also indicate that the RR condition resulted in more WCPM than all other conditions in both the immediate and retention assessments. The only exception to this is with Andrew, in which his average retention WCPM for the RR condition is five WCPM less than his first-ranked condition (LPP). With respect to the LPP and LO conditions, LPP generally outperformed the LO condition in both immediate and retention effects. When measuring immediate effects, LPP ranks second across all students except Kisha, and the difference between the LPP and LO conditions for Kisha is negligible (0.25 WCPM). In terms of retention effects, LPP is ranked second for all students except Andrew, in which it resulted in the highest average WCPM. It is also worth noting that the difference between the LPP and RR conditions in average WCPM for retention effects was not always in obvious favor of RR. More specifically, the LPP condition slightly outperformed the RR condition for Andrew, and for Kisha and Antonio, the LPP condition was within 2.5 and 5.5 WCPM, respectively. Given these data, the LPP condition may in some cases be comparable to the effects of the RR condition, particularly when evaluating students' reading fluency improvements over the course of ~2 days.

Discussion

The primary purpose of this study was to investigate the differential impact of small-group RR, LPP, and LO strategies on students' reading fluency when implemented in isolation from other academically based intervention strategies, and to compare these intervention strategies to a control, no-instructional intervention condition. Considering our measures of both immediate and retention WCPM gains, results indicated that each of the intervention strategies outperformed the CL condition. Across intervention conditions, the RR condition was more effective than the other conditions when evaluating students' immediate WCPM gains. With respect to retained WCPM gains, both the RR and LPP conditions outperformed the LO condition. However, neither RR nor LPP was consistently more effective than the other. For Lara, RR was clearly the most effective intervention to improve retained WCPM; but for the other three students, the differential effectiveness between RR and LPP was negligible.

These findings are consistent with the overall body of evidence supporting the use of fluency-based interventions to improve elementary-aged students' reading fluency (Chard et al. 2002; NRP 2000; Rose 1984; Therrien 2004), and more specifically, they add to the relatively smaller literature base supporting the use of small-group fluency building interventions (Begeny and Martens 2006; Begeny and

Silber 2006; Kuhn 2005). Although we did not directly compare the effects of similar one-on-one or dyadic reading fluency interventions to the small-group formats used in this study (which should be a topic for future research), the data from this study do suggest that small-group interventions can be effective in improving students' reading fluency of materials practiced for relatively brief periods of time.

These findings are important for educators to consider given the large number of elementary-aged students who struggle with reading fluency (Daane et al. 2005) and because students may not build their reading fluency to sufficient levels without specific practice conditions (Adams 1990; Torgesen et al. 2001). As such, educators should work to implement interventions such as the RR and LPP interventions described in this study, particularly with low- to average-performing readers. In fact, these small-group interventions are likely to be rated by teachers as more preferable compared to one-on-one or dyadic interventions (Witt et al. 1984). Within the context of an RtI model, the RR and LPP group-based interventions described in this study may be suitable at a Tier 1 level for all early elementary-aged students (as part of a supplement to their core reading curriculum that otherwise excludes structured practice opportunities for students to improve their reading fluency) or as a Tier 2 intervention for students showing signs of reading difficulty in the area of reading fluency. Of course, selection of the RR and/or LPP strategy at either the Tier 1 or Tier 2 level would depend on assessments of student needs, assessments of reading curriculum needs, as well as the school and teacher resources available for implementing group-based RR and LPP reading strategies.

A secondary purpose of this study was to offer some preliminary investigations of the specific types of small-group interventions we examined. For example, we investigated the effect of the RR intervention when it is modified in a way that allows only one teacher to implement the intervention with at least four students at once. Similar to the strong evidence supporting the use of RR in a dyadic, peer-based context (Mathes and Fuchs 1994) or in a one-on-one (student-adult) context (Therrien 2004), this study offers initial evidence supporting the use of this intervention with small groups of at least four children. As noted previously, this option for implementing the RR intervention may be preferable for many teachers because it requires fewer resources to intervene with a greater number of students.

This is also only the second known investigation of a school-based LO procedure when used with small groups to evaluate its impact on students' reading fluency. Similar to Kuhn's (2005) findings, when exposing students to reading passages with the goal of improving students' reading fluency, this study demonstrates there are relative advantages of using the RR (or even LPP) procedures over the widely used LO procedure. However, this is not to say that having students simply listen to a story read by the teacher without accompanying reading materials is poor educational practice, as evidence from this study suggests the LO procedures (compared to control conditions) slightly improved students' reading fluency of passages they listened to beforehand. Likewise, it is possible that teachers (and/or parents) use a LO procedure for other important educational purposes, such as helping children focus on comprehension, building vocabulary development, or creating an overall student appreciation for obtaining information from print

(Elley 1989; Rosenhouse et al. 1997). Therefore, LO seems more appropriate for addressing other important areas of reading than for purposes of improving students' reading fluency. This finding is not surprising since reading fluency seems best improved when students engage in practice strategies allowing for direct auditory *and* visual contact with the relevant stimuli, such as letters, isolated words, and/or connected text.

The LPP condition used in this study also represents what we know as only the second examination of this small-group reading fluency intervention. Specifically, we emulated the LPP procedures described by Begeny and Silber (2006) by including a specific component to better evaluate whether students were actually following along silently as the adult read aloud (i.e., students were periodically asked to read the next word in the story when the trainer paused from reading aloud). But unlike the Begeny and Silber investigation, this study examined the effects of this type of LPP intervention independently from other reading fluency interventions. Future research should address whether this added "attention procedure" of the LPP intervention enhances (or potentially weakens) the traditional small-group LPP intervention.

Another notable finding in this study is the general consistency between the immediate and retention assessments. Specifically, results suggest the immediate effects of the RR, LPP, and LO interventions did not dissipate over the course of multiple days. Also, the immediate and retention CL data from this study provide evidence that even a 1-min reading of a particular story helped to improve students' reading fluency of that story ~2 days later. However, the findings from this study represent only four second-grade students from one school, and given the small number of studies that have examined this form of retention measurement, additional research in this area is warranted. For example, future research may address some of the following questions: (a) are 2-days retention effects a better predictor than immediate effects when considering long-term intervention outcomes, perhaps as measured by other important reading measures (e.g., standardized measures of reading comprehension, end of grade test scores); (b) at what period of time does a retention effect begin to dissipate (e.g., after 1 week, more than 1 week) and is this type of potential dissipation meaningful in trying to improve students' reading fluency of un-practiced text; and (c) are certain reading fluency interventions more or less likely to result in stronger retention effects?

In addition to the limited sample size used in this study, there are other notable limitations and directions for future research. For example, inter-scorer agreement was not collected when assessing students' WCPM. Although this type of psychometric reliability is important in all empirical investigations, this potential limitation is mitigated by the fact that, as part of a separate project being conducted simultaneously with the present study, each experimenter in the present study had administered over 450 of these same assessments across the 3 months immediately preceding the start of the present project. Across those 3 months of assessments, each experimenter's inter-scorer reliability was calculated ~25% of the time and all experimenters obtained mean percentage agreement of 95% or higher. As such, although there were insufficient resources to collect inter-scorer agreement in the

present study, we felt confident that all experimenters in this study were well versed in CBM administration and assessment procedures.

Another potential limitation of this study is that we did not specifically examine the role of the reinforcers that were delivered for on-task behavior during instructional procedures. Although this behavior program was very similar to the types of reward programs regularly used by teachers, it is possible that it impacted the effectiveness of the interventions. Future research could examine the effects of these interventions with and without a program to promote students' on-task behavior. Similarly, the specific group dynamic of the participants in this study could have influenced the results. Thus, future research should also attempt to replicate the findings from this study with other small groups of students.

Finally, the present study only evaluated changes in WCPM on practiced material. This measure of reading fluency has been shown to be associated with improvements across a range of reading skills, including comprehension and reading accuracy and rate of non-practiced material (Begeny and Martens 2006; Fuchs et al. 2001; NRP 2000; Therrien 2004). However, to expand upon the present findings, future research should examine the LPP, RR, and/or LO intervention strategies using additional reading measures (e.g., measures of rate, accuracy and comprehension of non-practiced material).

Overall, the findings from this study offer evidence for using the RR and LPP procedures, which can be implemented by a single teacher/adult with at least four students at once. Educational support staff (e.g., school psychologists) who consult with teachers about students with reading difficulties might recommend these interventions as time-efficient, evidence-based strategies for improving students' reading fluency. Furthermore, educators (such as school psychologists) who employ a scientist-practitioner model in their work setting may utilize the methods used in this study to evaluate both immediate and retention reading gains as outcomes of a given academic intervention. Because limited research exists regarding the importance and predictive value of retention assessments on overall intervention effectiveness, employing this type of assessment may help educators better discern the effectiveness of a given intervention.

References

- Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT.
- Ardoin, S. P., Suldo, S. M., Witt, J., Aldrich, S., & McDonald, E. (2005). Accuracy of readability estimates' predictions of CBM performance. *School Psychology Quarterly*, 20, 1–22.
- Ambuster, B., Lehr, F., & Osborn, J. (2001). *Put reading first: The research building blocks for teaching children to read (Kindergarten through Grade 3)*. Washington, DC: National Institute for Literacy.
- Begeny, J. C., & Martens, B. K. (2006). Assisting low-performing readers with a group-based reading fluency intervention. *School Psychology Review*, 35, 91–107.
- Begeny, J. C., & Silber, J. M. (2006). An examination of group-based treatment packages for increasing elementary-aged students' reading fluency. *Psychology in the Schools*, 43, 183–195.
- Bliss, S. L., Skinner, C. H., Hautau, B., & Carroli, E. E. (2008). Articles published in four school psychology journals from 2000 to 2005: An analysis of experimental/intervention research. *Psychology in the Schools*, 45, 483–498.

- Bus, A. G., Belsky, J., van Ijzendoorn, M., & Pellegrini, A. (1995). Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research*, *65*, 1–21.
- Chard, D. J., Vaughn, S., & Tyler, B. J. (2002). A synthesis of research on effective interventions for building reading fluency with elementary students with learning disabilities. *Journal of Learning Disabilities*, *35*, 386–406.
- Clarke-Stewart, K. A. (1998). Reading with children. *Journal of Applied Developmental Psychology*, *19*, 1–14.
- Daane, M. C., Campbell, J. R., Grigg, W. S., Goodman, M. J., & Oranje, A. (2005). *Fourth-grade students reading aloud: NAEP 2002 special study of oral reading*. Washington, DC: U.S. Department of Education, National Center for Education Statistics. Government Printing Office.
- Daly, E., & Martens, B. K. (1994). A comparison of three interventions for increasing oral reading performance application of the instructional hierarchy. *Journal of Applied Behavior Analysis*, *27*, 459–469.
- Elley, W. B. (1989). Vocabulary acquisition from listening to stories. *Reading Research Quarterly*, *24*, 174–187.
- Fuchs, L. S., Fuchs, D., Hosp, M. K., & Jenkins, J. R. (2001). Oral reading fluency as an indicator of reading competence: A theoretical, empirical, and historical analysis. *Scientific Studies of Reading*, *5*, 239–256.
- Good, R. H., & Kaminski, R. A. (Eds.). (2002). *Dynamic indicators of basic early literacy skills* (6th ed.). Eugene, OR: Institute for the Development of Educational Achievement. Available: <http://dibels.uoregon.edu/>.
- Hasbrouck, J., & Tindal, G. A. (2006). Oral reading fluency norms: A valuable assessment tool for reading teachers. *The Reading Teacher*, *59*, 636–644.
- Kuhn, M. R. (2005). A comparative study of small group fluency instruction. *Reading Psychology*, *26*, 127–146.
- Lee, J., Grigg, W., & Donahue, P. (2007). *The nation's report card: Reading 2007 (NCES 2007-496)*. Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.
- Mathes, P. G., & Fuchs, L. S. (1994). The efficacy of peer tutoring in reading for students with mild disabilities: A best-evidence synthesis. *School Psychology Review*, *23*, 59–80.
- McCurdy, M., Daly, E. J., Gortmaker, V. J., Bonfiglio, C. M., & Persampieri, M. (2007). Use of brief instructional trials to identify small group reading instructional strategies: A two experiment study. *Journal of Behavioral Education*, *16*, 7–26.
- Meyer, L. A., Wardrop, J. L., Stahl, S. A., & Linn, R. L. (1994). Effects of reading storybooks aloud to children. *Journal of Educational Research*, *88*, 69–85.
- National Reading Panel. (2000). Fluency. In National Reading Panel (Ed.), *Teaching children to read (chapter 3)*. Washington, DC: National Institute of Child Health and Human Development.
- Rashotte, C. A., MacPhee, K., & Torgesen, J. K. (2001). The effectiveness of a group reading instruction program with poor readers in multiple grades. *Learning Disability Quarterly*, *24*, 119–134.
- Rose, T. (1984). Effects of previewing on the oral reading of mainstreamed behaviorally disordered students. *Behavioral Disorders*, *10*, 33–39.
- Rosenhouse, J., Feitelson, D., Kita, B., & Goldstein, Z. (1997). Interactive reading aloud to Israeli first graders: Its contribution to literacy development. *Reading Research Quarterly*, *32*, 168–183.
- Scarborough, H. S., & Dobrich, W. (1994). On the efficacy of reading to preschoolers. *Developmental Review*, *14*, 245–302.
- Shinn, M. R. (1989). *Curriculum-based measurement: Assessing special children*. New York: Guilford.
- Skinner, C. H., Cooper, L., & Cole, C. L. (1997). The effects of oral presentation previewing rates on reading performance. *Journal of Applied Behavior Analysis*, *30*, 331–333.
- Spache, G. (1953). A new readability formula for primary-grade reading materials. *The Elementary School Journal*, *53*, 410–413.
- Teale, W. H. (2003). Reading aloud to young children as a classroom instructional activity: Insights from research and practices. In A. van Kleeck, S. A. Stahl, & E. B. Bauer (Eds.), *On reading books to children: Parents and teachers* (pp. 114–139). Mahwah, NJ: Lawrence Erlbaum.
- Therrien, W. J. (2004). Fluency and comprehension gains as a result of repeated reading. *Remedial and Special Education*, *25*, 252–261.

- Torgesen, J. K., Rashotte, C. A., & Alexander, A. W. (2001). Principles of fluency instruction in reading: Relationships with established empirical outcomes. In M. Wolf (Ed.), *Dyslexia, fluency, and the brain* (pp. 333–355). Timonium, MD: York.
- Witt, J. C., Martens, B. K., & Elliott, S. N. (1984). Factors affecting teachers' judgments of the acceptability of behavioral interventions: Time involvement, behavior problem severity, and type of intervention. *Behavior Therapy*, *15*, 204–209.
- Wolf, M., & Katzir-Cohen, T. (2001). Reading fluency and its intervention. *Scientific Studies of Reading*, *5*, 211–239.

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