# IMPROVING ORAL READING FLUENCY WITH A PEER-MEDIATED INTERVENTION

KRISTI L. HOFSTADTER-DUKE AND EDWARD J. DALY, III

UNIVERSITY OF NEBRASKA–LINCOLN

This study examined the effects of an experimentally derived, peer-delivered reading intervention on the oral reading fluency of a first-grade student who had been referred for poor reading fluency. Same-grade peers were trained to lead the target student through a structured intervention protocol based on the results of a brief experimental analysis. Results indicated that reading improvements were obtained and are discussed in terms of selecting efficient interventions for use by peers.

Key words:  brief experimental analysis, multiple-probe design, oral reading fluency, peer tutoring, reading interventions

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As one of the five basic areas of literacy (National Reading Panel [NRP], 2000), oral reading fluency is a critical prerequisite to independent comprehension of text. Unfortunately, oral reading fluency is frequently neglected by classroom teachers (NRP, 2000; Topping, 2006) who may feel pressed to spend more time working on comprehension tasks and not devote sufficient time to practicing oral reading of connected texts. Peer-mediated interventions (i.e., the use of other students as change agents) may be an efficient method to have students practice tasks to improve fluency with basic academic skills like oral reading (Hoff & Robinson, 2002). Peer-mediated interventions have been shown to improve reading outcomes (e.g., Greenwood et al., 1984; McMaster, Fuchs, & Fuchs, 2006; Yurick, Robinson, Cartledge, Lo, & Evans, 2006). Besides reducing the amount of direct instruction required by the teacher, peers are a readily available resource and have frequent contact with each other, making them a potential source of reinforcement. Contact with natural reinforcement contingencies such as prosocial peer interactions through a structured

intervention may promote maintenance of intervention effects.

An intervention can provide maximum benefits to the learner when it contains the right amounts of practice, error correction, antecedent prompting strategies, and reinforcement, which often differs across students (Daly, Martens, Barnett, Witt, & Olson, 2007). Brief experimental analysis (BEA) has proven to be useful for selecting intervention components on an individualized basis. Reading interventions selected based on BEA results have led to increased oral reading fluency when implemented by experimenters (VanAuken, Chafouleas, Bradley, & Martens, 2002), teachers (Bonfiglio, Daly, Persampieri, & Andersen, 2006), parents (Daly, Shroder, & Robinson, 2001/2006; Gortmaker, Daly, McCurdy, Persampieri, & Hergenrader, 2007; Persampieri, Gortmaker, Daly, Sheridan, & McCurdy, 2006), and even the students themselves (Daly, Persampieri, McCurdy, & Gortmaker, 2005). The purpose of the current study was to evaluate the effects of an experimentally derived reading intervention, delivered by peers, on the oral reading fluency of a first-grade student. Same-grade peers were trained to lead the target student through a structured intervention that was based on the results of a BEA. Oral reading fluency was measured with intervention passages within a multiple-probe design. In addition,

generalization to equally difficult but independent reading passages was probed across baseline and intervention phases.

## METHOD

### Participant, Peer Tutors, and Setting

Michelle was a 7-year-old first-grade Caucasian girl who had been referred for reading problems. She had no known psychoeducational diagnoses and received no intervention or special education services. At the time of referral, Michelle was reading 11 correctly read words (CRW) per minute, compared to the class average of 66 CRW per minute. Three children in the same classroom were selected by the teacher to be peer tutors. All chosen tutors exceeded the classroom average reading performance as well as the first-grade Dynamic Indicators of Basic Early Literacy Skills (DIBELS) spring benchmark (i.e., 40 CRW per minute; Good & Kaminski, 2002). During the winter DIBELS administration period, tutors read an average of 88 CRW (range, 78 to 107). Assessments (conducted by the experimenter) and reading intervention sessions (conducted by tutors) occurred in the classroom.

### Materials and Screening

Intervention passages for the BEA were drawn from the Silver, Burdett, and Ginn reading series (Pearson et al., 1989), and intervention passages for the peer-mediated intervention consisted of six passages selected from the school's reading curriculum (Treasures, 2006). The intervention (curriculum) passages contained a median of 216 words (range, 171 to 473 words), and the median Flesch-Kincaid grade level was 1.2 (range, 0.9 to 3.1). Measurements were conducted in intervention passages as well as high-word-overlap passages. Passages that contained a high percentage of overlapping words (i.e., 80% to 95%) but were written as a different story (i.e., high-word-overlap passages) were used for the BEA. Intervention passages were used to assess the direct impact of the peer-mediated fluency intervention. Passages from the DIBELS oral reading fluency progress-monitoring materials (Good & Kaminski, 2002) were used as generalization probes.

### Measurement and Interscorer Agreement

Responses were measured as CRW and errors per minute. CRW included words pronounced correctly within 3 s, including self-corrections. Error words included omissions, mispronunciations, and hesitations of more than 3 s. The experimenter conducted all assessments. An independent scorer scored 33% of the assessment sessions. Average interobserver agreement (calculated based on the point-by-point agreement method for both CRW and errors) was 99% (range, 95% to 100%).

### Design and Procedure

For the BEA, three conditions (described below) were briefly alternated. The baseline and effective intervention conditions were repeated once using independent stimulus materials to replicate the results. To evaluate whether performance increased as a result of the peer-mediated intervention, a multiple-probe design was used with the intervention (Treasures, 2006) passages. After baselines were established on all passages, tutoring was conducted with one passage per week while measurements were taken repeatedly across all six passages for 6 weeks to conform to design requirements.

*BEA.* Baseline and two intervention conditions—instruction (IN) and instruction plus reward (IN+R)—were administered to Michelle in one session, followed by a replication. A prior evaluation had determined that Michelle's reading performance did not improve with a reward only. Therefore, this condition was not included in the BEA. IN included listening passage preview (i.e., experimenter modeling of fluent reading), repeated readings (i.e., student read the passage three times), and error correction (i.e., the experimenter modeled correct reading of error words and had the

student read the phrase containing an error word three times). For the reward, Michelle selected her choice of activity (e.g., lunch with the teacher, coloring time; these were based on a prior stimulus preference assessment) if she exceeded her previous score. When her CRW per minute improved in a session, the experimenter presented a menu of activities to Michelle and arranged for her to have access to the chosen activity on the same day.

*Peer-mediated reading intervention.* The teacher trained the tutors using explanations, modeling, and practice of the protocol. At the beginning of each week, the teacher prompted Michelle to choose a reading partner. Prior to each intervention session, the experimenter assessed Michelle using four of the six curriculum passages (i.e., the current weekly intervention passage and three other randomly selected intervention passages to establish concurrent measures across passages for design purposes). The teacher then reminded the students of the contingency for performance improvements, provided the intervention checklist, and directed the students to begin. Instructional steps included listening passage preview, repeated readings, and word supply error correction. After the intervention session, the teacher timed Michelle's third reading while measuring CRW per minute (with the same procedures used by the experimenter) and graphed her performance. (These data do not appear in the data display.) If Michelle exceeded her previous performance, the teacher awarded points (i.e., one point for exceeding CRW and one point for reducing errors) that could be exchanged for permission to engage in a shared activity with the peer tutor after six points had been earned. Intervention sessions were conducted for approximately 30 min daily. Peer tutoring was applied sequentially across passages so that intervention sessions were conducted with one story per week. The tutors followed 92% of the steps correctly on average (range, 77% to 100%) across all sessions.

*Generalization probes.* Generalization to novel, low-word-overlap passages was routinely probed using first-grade DIBELS oral reading fluency progress-monitoring materials (Good & Kaminski, 2002). Probes were administered concurrently with the other passages during baseline and immediately prior to peer-tutoring sessions during the intervention phase.

## RESULTS AND DISCUSSION

The results of the BEA are presented in Figure 1 (top). The IN+R condition led to greater improvements in responding than the IN condition. Therefore, all the components were included in the reading fluency intervention. The results displayed in Figure 2 reveal that performance increased (including both improved CRW and reduction in errors) following the introduction of peer tutoring across all passages. Baseline performance remained stable for subsequent passages, indicating that experimental control was achieved. Moreover, improvements were maintained when the intervention was no longer delivered for a particular passage (Passages 1 through 5). Results of the generalization probes (Figure 1, bottom) indicate that a clear change in level was correlated with the introduction of the peer-mediated intervention for both CRW per minute (increase in performance) and errors per minute (reduction in performance). Anecdotally, the teacher stated that Michelle was "like a different child," in that both her reading and peer interactions improved significantly. The teacher observed fewer negative interactions (e.g., name calling) and more positive social interactions. The teacher also reported that the intervention was easy to supervise, required minimal time, and produced the desired effects.

The results extend the use of BEA to peer-mediated interventions, demonstrating that individualized reading fluency interventions can be competently carried out even by well-trained first-grade students. A further advantage
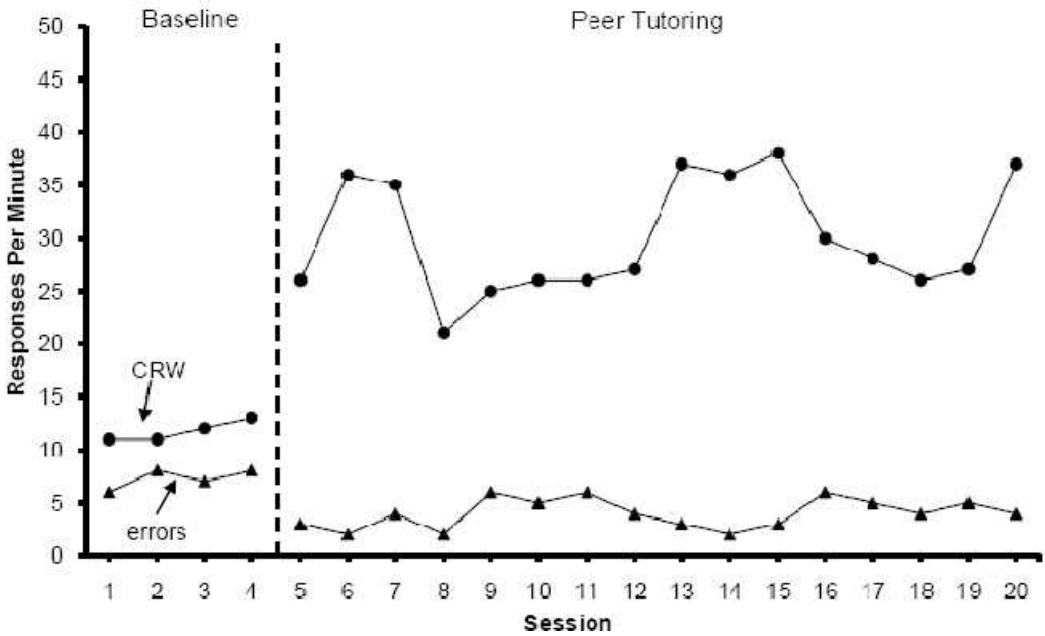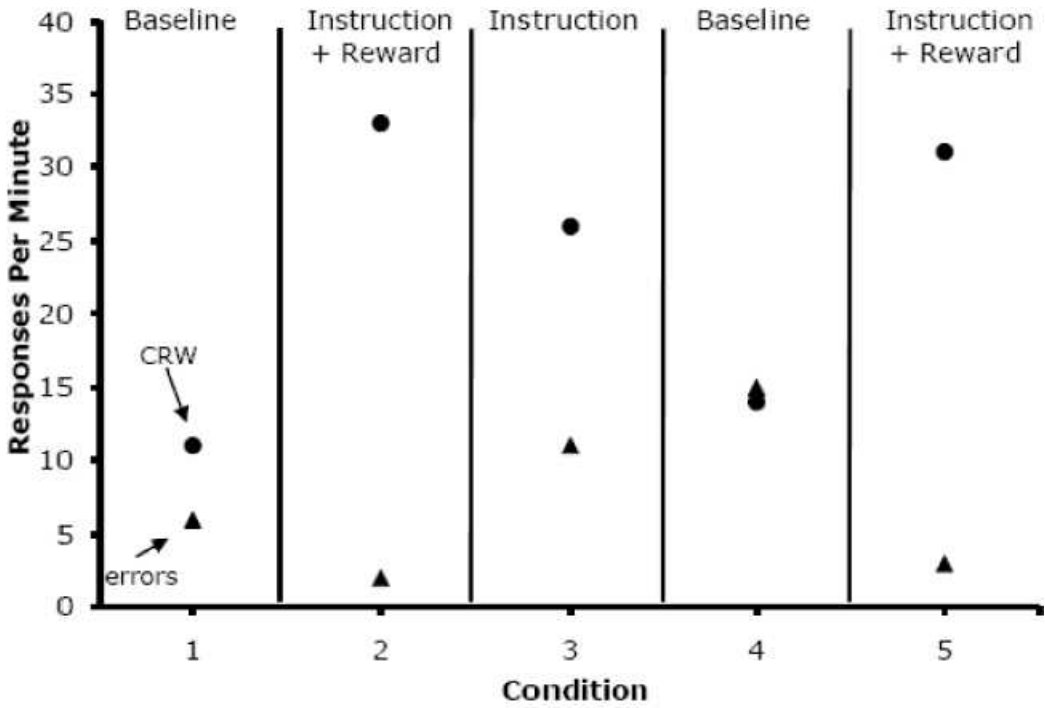
Figure 1.    Michelle's CRW and errors per minute during the brief experimental analysis (top) and tutoring (bottom) with low-word-overlap passages.
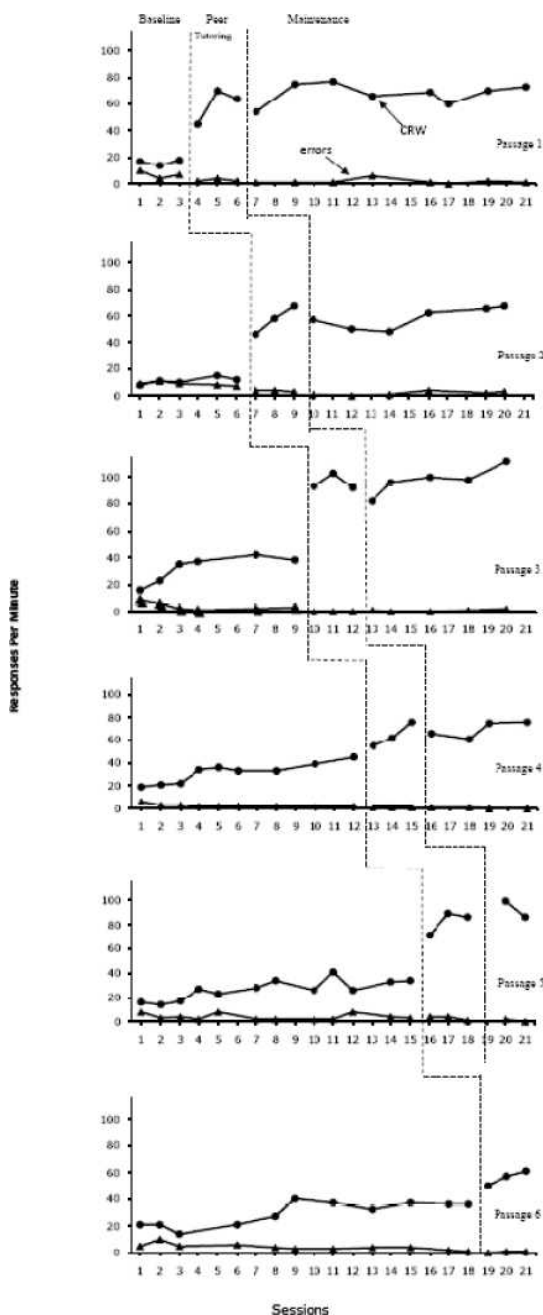
Figure 2. Michelle's CRW and errors per minute with intervention passages.

of using peers to deliver interventions is that they can provide social reinforcement that may produce other intangible but important benefits. In the current case, the teacher observed the peers praising Michelle for appropriate behavior during small-group instruction as well. Thus, natural reinforcement contingencies may have been altered as a by-product of the peer-mediated intervention, which would explain the consistent increase in academic responding under conditions in which there was no programmed reinforcement.

The generalizability of these results to other students is limited by the fact that they were based on only one student. Some of the positive features of the environment may further limit generalizability of the results. For example, the teacher and peers were highly cooperative. The same results might not be achieved under less optimal circumstances. The individual contributions of the instructional components (e.g., practice vs. error correction) also cannot be identified. Future investigations could determine whether positive results are obtained with different configurations of interventions.

Although the design choice for the generalization probes did not permit the establishment of experimental control, the data do suggest that there was a significant change in oral reading fluency (both in terms of CRW per minute and errors) that was correlated with the introduction of peer tutoring. The remarkable aspect of this finding is that the results were obtained with low-word-overlap passages, providing a more compelling demonstration of effect. These results appear to augment the visible effects obtained with the intervention passages. We would argue that the results further strengthen the suggestion that measurement of generalized responding should become the standard of academic intervention studies (Daly et al., 2007). In future studies, a systematic evaluation of generalized responding following academic intervention within an experimental design would be helpful for determining whether students' responding is coming under the stimulus control of the universe of possible stimulus–response relations that are necessary for them to progress through school curricula (Alessi, 1987).

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