

THREE VERSUS SIX REREADINGS OF PRACTICE PASSAGES

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Although the literature clearly demonstrates that repeated readings result in immediate effects on students' performance on the intervention materials as well as long-term benefits, data are less promising regarding its immediate generalization effects to similar materials. Using an alternating treatments design, the current study evaluated the effects of a multicomponent repeated reading intervention on generalization passages after students had read a passage three versus six times. Results indicated improvements in fluency as a result of both interventions, with slightly greater maintenance effects when students were given six opportunities to read passages.

DESCRIPTORS: generalization, reading fluency, repeated readings

Reading fluency is a key component of effective reading instruction, because it is a necessary, although not sufficient, skill for accomplishing the ultimate goal of comprehension. One instructional practice for which there is substantial evidence in both the behavioral and the cognitive literature for improving students' reading fluency is repeated readings (RR). The studies that have examined multicomponent RR interventions have demonstrated repeatedly that providing students with modeling in the form of listening passage preview, multiple opportunities to practice passages, corrective feedback, and contingencies for improved reading can substantially increase students' fluency on practice passages (e.g., Ardoin, McCall, & Klubnik, 2007; Eckert, Ardoin, Daly, & Martens, 2002; Gortmaker, Daly, McCurdy, Persampieri, & Hergenrader, 2007). Unfortunately, evidence from these studies indicates that observed effects on practice passages do not necessarily result in generalization effects on similar passages with a

high percentage of the same words. For instance, intervention failed to result in acceptable levels of generalization on generalization passages for 3 of the 4 students in one study and 2 of the 3 students in a second study (Daly, Martens, Dool, & Hintze, 1998; Daly, Martens, Hamler, Dool, & Eckert, 1999, respectively). Thus, it is not clear from these studies that providing intervention on the first half of a story would have substantial, immediate, and beneficial effects for the student when reading the latter half of the same story.

Failure of multicomponent RR interventions to lead to substantial gains on generalization passages led Ardoin et al. (2007) to evaluate alternative procedures to promote generalization. Ardoin et al. compared the effects of allowing students to read one passage four times and a multiple-exemplar condition in which students read two high-word-overlap passages twice each. Results showed that although the multiple-exemplar condition provided repeated exposure to the same words in a different context, four readings of one passage allowed greater generalization to new passages. This suggested that an increased number of rereadings may be the most important independent variable for generalization to occur. The

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purpose of the current study was, therefore, to extend the literature by evaluating whether doubling the treatment dose of a multicomponent RR intervention would lead to greater generalization and maintenance effects on similar generalization passages. Because we wished to evaluate differences in dosage, it was important to select a set number of repeated readings, as opposed to having students reread each passage until they met a preestablished criterion, as is sometimes done in the literature. RR procedures vary, with some studies requiring a minimum of two readings and a maximum of four readings (Therrien, Wickstrom, & Jones, 2006) and others specifying three or four rereadings (Ardoin, Eckert, & Pender, 2008; Daly *et al.*, 1998; Manlanga, 2003). Given this variability, we established the single dosage to be three rereadings.

METHOD

Participants were 4 boys who resided in and received their education at a residential facility for troubled youth and had been identified as being likely to benefit from a fluency-based intervention (Shane was 11 years 8 months old and in fourth grade, Seth was 12 years 6 months old and in fifth grade, Roland was 7 years 5 months old and in second grade, and James was 7 years 10 months old and in second grade). Shane had been identified with an educational disability (learning disabled, language). All sessions were conducted at a desk placed in a quiet hallway outside the participants' classrooms. One intervention session was conducted per day.

Materials

A survey-level assessment was conducted to determine the appropriate instructional level at which to implement the intervention. This involved administering sets of three passages at successive levels of difficulty for 1 min while an examiner recorded reading errors and provided words to students on which they hesitated for

3 s. The median number of words read correctly in 1 min (WRCM) was used to determine each participant's instructional level. Shane and Roland received intervention on first-grade passages because their WRCM fell just below the recommended instructional level for first-grade materials (40 to 60 WRCM; Shapiro, 1996). Similarly, James's reading of second-grade passages fell just below the instructional level for second-grade materials (also 40 to 60 WRCM; Shapiro); thus, he received intervention on second-grade passages. The survey-level assessment indicated that Seth's performance on third-grade material was just over the minimum WRCM for the third-grade level (70 to 100 WRCM; Shapiro) and fell far below the instructional range for fourth-grade materials. Seth therefore received intervention in third-grade materials.

Thirteen randomly selected passages from the first-, second-, and third-grade levels of the Silver Burdett Ginn (1991) basal reading series were selected as practice passages. Generalization passages were developed by writing new passages that contained a large portion of the words that were included in the practice passages. Passage overlap was calculated by dividing the total number of words that appeared in both passages by the total number of words in the generalization passage (Daly & Martens, 1994). Practice passages ranged in length from 95 to 179 words across grades (first-grade $M = 115$, range, 95 to 154; second-grade $M = 117$, range, 90 to 153; third-grade $M = 152$, range, 124 to 179), and generalization passages ranged in length from 83 to 161 across grades (first-grade $M = 99$, range, 83 to 128; second-grade $M = 98$, range, 85 to 130; third-grade $M = 102$, range, 82 to 161). Percentage overlap between generalization and practice passages ranged from 78% to 95% across grades (first-grade $M = 87%$, range, 78% to 98%; second-grade $M = 86%$, range, 78% to 98%; third-grade $M = 89%$, range, 83% to 95%).

Given the failure of readability formulas to account for passage difficulty (Ardoin, Suldo, Witt, Aldrich, & McDonald, 2005), practice passages were assigned to conditions based on their level of difficulty, as determined by each student's preassessment reading of the passages (Christ & Ardoin, 2009). Across 3 days, students read 13 practice passages at their instructional level. Students read each passage for 1 min without error correction. A student's WRCM on each passage was used to match passages according to difficulty. Then, one passage from each pair was randomly assigned to a condition. During this preassessment, students earned a token for exceeding a predetermined score. Every two tokens were exchangeable for a tangible reward.

Procedure and Design

Using a rapid reversal design, differences in students' fluency on practice and generalization passages were evaluated as a function of two multicomponent RR interventions. The interventions differed only in whether students reread passages three (RR3) or six (RR6) times. Components of the interventions included (a) the passage being read to the student, (b) the student given either three or six opportunities to read the passage aloud for 2 min, (c) the student being told after each reading how many words he read correctly in 1 min and incorrectly during the 2-min period, and (d) error-correction procedures at the end of each reading. Error-correction procedures involved phrase drill error correction and syllable segmenting and blending. Phrase drill error correction involved the experimenter correctly reading the word misread by the student, the student correctly reading the word, and then reading the three- to five-word phrase containing the misread word. Syllable segmenting and blending were provided on words that students misread in two separate readings of the practice passage. Syllable segmenting and blending involved the experimenter modeling the individual syllables of the missed word, then having

the student repeat the syllable as modeled by the examiner, repeat the syllables at a faster pace, and finally blending the syllables so that they read the word at a normal pace (Ardoin et al., 2007).

WRCM was assessed during each practice reading. During each reading, the experimenter counted a word as read correct if it was pronounced correctly given the context of the passage within 3 s or incorrect if pronounced incorrectly and not self-corrected within 3 s. Although students were allowed to read practice passages for 2 min, WRCM was assessed only during the first minute of reading. Students were allowed to read the passage for 2 min instead of only 1 min to increase the probability that they would be able to read the entire passage during each practice reading. Immediately following three or six rereadings (depending on condition), the participant was prompted to read the corresponding generalization passage. One week later, the participant was prompted to read the same generalization passage. Data were collected on WRCM as described above. Participants read generalization passages for only 1 min, and error-correction procedures were not implemented. Participants were given a token each time they exceeded their preassessment WRCM score on the corresponding practice passage and each time they exceeded their WRCM on a generalization passage from the first reading of the corresponding practice passage. Every two tokens were exchangeable for a tangible reward (e.g., pencil, eraser).

Using the identical procedural checklists employed by experimenters, independent observers listened to an audio recording of over 33% of all session types to assess procedural integrity. Mean procedural integrity across participants was 100%. Interobserver agreement was also examined by independent experimenters who listened to audiotapes of the same sessions assessed for procedural integrity. Agreement was calculated by dividing the number of

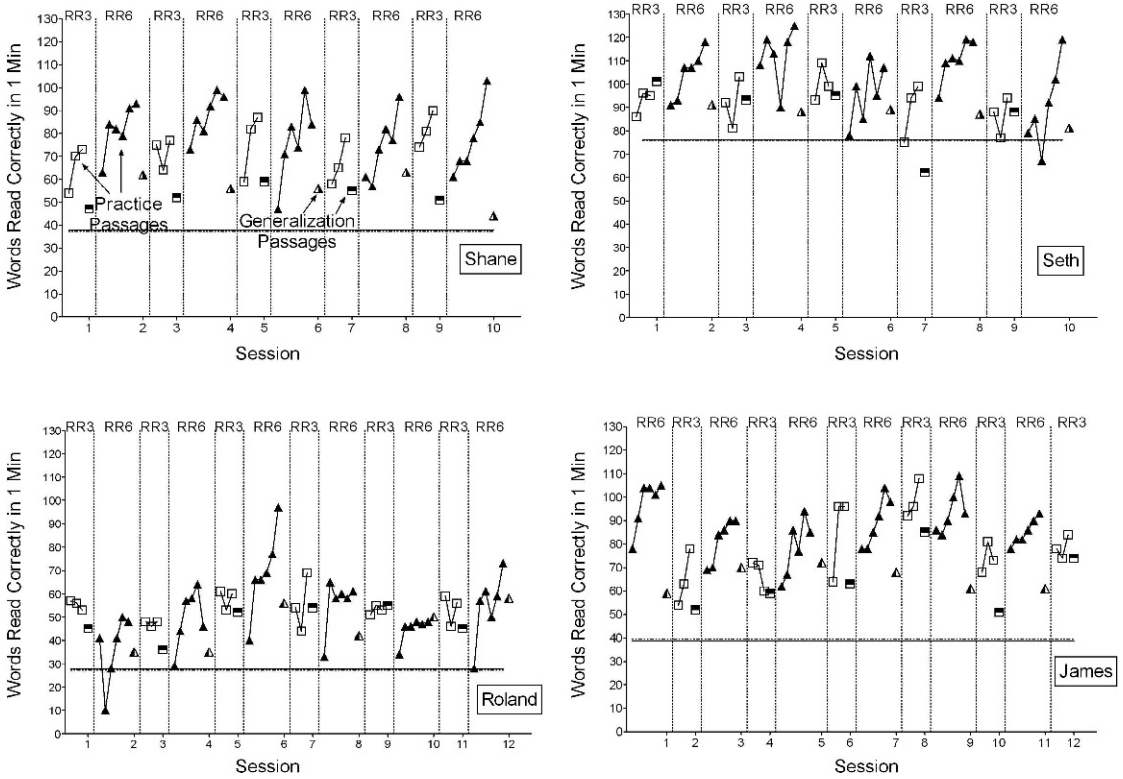


Figure 1. Words read correctly in 1 min (WRCM) for Shane, Seth, Roland, and James on each successive reading of the practice passages during the RR3 and RR6 conditions (represented by the data points connected with lines). Data also illustrate students' WRCM on corresponding generalization passages on intervention days (represented by the disconnected data points). The horizontal lines represent students' mean preassessment WRCM on RR3 (dashed line) and RR6 (solid line) practice passages.

words agreed on as correct and incorrect by the total number of words read times 100%. Mean agreement across participants was 99% (range, 83% to 100%).

RESULTS AND DISCUSSION

Both multicomponent RR interventions resulted in substantial increases in participants' WRCM on practice passages compared to their preassessment performances on these passages (see Figure 1). With each successive reading of a practice passage, participants' WRCM on that passage increased. Doubling the number of reading opportunities usually resulted in students reading practice passages with greater fluency. Although performance on generaliza-

tion passages was not as high as the final performances on respective practice passages, it was substantially higher than preassessment performance on the practice passages. With the exception of three sessions for Roland, both interventions resulted in all participants reading all generalization passages in the instructional range (40 to 60 WRCM), with Seth's fluency on generalization passages occasionally approaching mastery (>100 WRCM). Notably, performances on the generalization passages administered immediately after intervention did not differ as a function of condition, suggesting that doubling the number of reading opportunities did not provide greater generalization of fluent reading to new but similar passages.

Table 1

Mean Words Read Correctly in 1 Min (WRCM) on Practice Passages at Prereading, Across Greatest WRCM per Session, and Across Last Reading per Session; and Mean WRCM on High Word Overlap Passages on Intervention Day and at 1-Week Maintenance

	Practice passages			Generalization passages	
	Prereading	Greatest WRCM per session	Last reading (Reading 3 or 6)	Intervention day	Maintenance
Shane					
RR3	37.4	81	80.6	52.8	72.2
RR6	38	98	98	57.6	77.2
Seth					
RR3	76.75	102.2	100.2	87.8	95
RR6	76.2	118.60	118.6	87.2	104.25
Roland					
RR3	27.33	58.17	58.17	47.83	44.17
RR6	27.66	66.17	66.17	46	49
James					
RR3	39.33	81.5	86.5	64	66.67
RR6	38.67	99.17	99.17	65.17	78

Shane's, Seth's, and James's performances on generalization passages read 1 week after intervention exceeded their performances on generalization passages administered immediately after intervention. Interestingly, in two cases (Shane and Seth), performances on generalization passages read 1 week after intervention approached performances on the corresponding practice passages on intervention day (see Table 1). These results are consistent with those of Martens et al. (2007). Greater fluency on generalization passages administered 1 week after intervention compared to immediately following intervention may be an artifact of fatigue after having already read practice passages multiple times. However, the upward trend in WRCM across sessions during RR3 and RR6 suggests that students were not fatigued. Therefore, it is unclear why performance at maintenance exceeded performance on same-day generalization probes.

Interestingly, mean WRCM on generalization passages 1 week after intervention was greater overall for the generalization passages associated with the RR6 condition (Table 1). It is possible that the RR6 condition promoted the development of greater stimulus control for

words shared between practice and generalization passages resulting in greater generalization and maintenance effects. However, there are many skills necessary for fluent reading (e.g., phonemic awareness, sophisticated decoding skills), and more research on stimulus control in the acquisition of reading fluency is necessary before any conclusions can be drawn.

A limitation inherent in this and other studies of repeated readings is the variability of passage difficulty within and across conditions. Unfortunately, procedures do not currently exist by which passage difficulty can be assessed to ensure that passages are exactly equivalent in level of difficulty (Christ & Ardoin, 2009). A large portion of the variance in student performance within and across conditions could be a function of variation in passage difficulty. In an attempt to control variability in the difficulty of passages, we preassessed passage difficulty to assign passages to the two intervention conditions. Unfortunately, preassessment of passage difficulty was conducted only on practice passages. One cannot be certain of the equivalence between practice and generalization passages within conditions or of the equivalence of generaliza-

tion passages across conditions. Although exact equivalence between practice passages and corresponding generalization passages cannot be assumed, an overlap of 78% to 98% of the words between corresponding passages suggests a high degree of correspondence in passage difficulty. Other factors that could influence passage difficulty (e.g., sentence length) were not controlled, however. Although the lack of preassessment on the generalization passages may be viewed as a limitation of the study, assessing passage difficulty on generalization passages would have resulted in the potential of practice effects as an explanation for the gains on generalization passages. Future studies could compare generalization performance both with and without a preassessment of generalization passages to allow the evaluation of the impact of preassessment on performance when generalization passages are read.

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