AN EXPERIMENTAL ANALYSIS OF READING INTERVENTIONS: GENERALIZATION ACROSS INSTRUCTIONAL STRATEGIES, TIME, AND PASSAGES

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This study examined the generalized effects of three treatment conditions (performance based, skill based, and a combination of the two) on oral reading fluency by an elementary school student. Results indicated equal effectiveness of all treatments, maintenance, and possible evidence of generalization across passages.

DESCRIPTORS: reading, fluency, generalization, instruction, reinforcement

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The distinction between skill deficits and performance deficits (Lentz, 1988) helps to narrow the field of treatment options for the practitioner who has a strong suspicion that a problem is due to one reason or another. Two recent studies (Eckert, Ardoin, Daisey, & Scarola, 2000; Eckert, Ardoin, Daly, & Martens, 2002) have examined the separate and combined effects of skill-based (i.e., instruction) and performance-based (i.e., con-

tingency management or performance feedback) treatment components with elementary students. A remarkable feature of the data in both studies was the variability within subjects and within treatment conditions. Results were largely undifferentiated across intervention conditions for some participants. Although experimental analyses may uncover critical variables in the treatment selection process, concerns persist about the reliability of results and our current ability to characterize students accurately as in need of skill- or performance-based treatments. The purpose of this investigation was to compare the treatment, maintenance, and possible generalized effects of skill-based and performance-based interventions across three

intervention conditions for an elementary school girl using a multiple probe design across tasks (reading passages).

METHOD

Participant and Setting

Procedures were carried out individually with Camille, a third-grade girl, in an isolated office of an after-school tutoring program.

Materials

All reading passages were chosen from the Silver, Burdett, and Ginn basal reading series (Pearson et al., 1989). Only narrative and expository texts were used. After repeated assessment with 13 randomly chosen passages, the six passages that most closely resembled one another in terms of trend, level, and variability in correctly read words (CRW) per minute and errors were chosen for inclusion in the study.

Experimental Design and Procedure

Using a multiple probe design across tasks (novel reading passages), each of the six passages was assigned to a single treatment condition in a semirandom fashion. Based on the results of the 1st week of baseline data, the passages were ranked in terms of difficulty level (the three more difficult and the three less difficult passages). Each treatment condition was randomly assigned to one of the first three passages (easier) and one of the second three sets of passages (more difficult). On treatment days, all three treatment conditions were carried out in randomized order. Camille's performance was scored as CRW per minute (Shinn, 1989) for every session.

Baseline and maintenance. In baseline and maintenance phases, Camille read all six passages. She was instructed to read the entire passage aloud while the experimenter marked errors and recorded the 1-min mark

as well as the completion time. Camille read the passages two to three times during weeks of baseline and maintenance data collection.

Performance-based treatment. In this condition, tangible items (e.g., pencils, pens, small games, markers, etc.) were offered for achieving quantitative performance goals. The experimenter told Camille that she could earn a reward for meeting a goal. A reward box containing tangible items was presented to Camille, who was allowed to choose an item. Goals were individualized daily and were determined based on Camille's best performance in a given passage to date.

Skill-based treatment. In this condition, Camille read the passage twice, receiving phrase drill error correction (O'Shea, Munson, & O'Shea, 1984) after the first reading and feedback on how quickly she read the passage after both readings.

Combined performance-based and skill-based treatment. In this condition, the procedures of both treatment conditions were combined, thereby provided goal setting, feedback, tangible rewards, opportunities to respond, and error correction.

Interobserver Agreement and Treatment Integrity

Experimental sessions were audiotaped. Independent scorers listened to sessions and independently scored the participant's reading for interobserver agreement and checked off steps completed from session protocols. Interobserver agreement was calculated based on the number of agreements between the experimenter and independent scorer divided by the total possible number of agreements and disagreements (i.e., total number of words attempted in the session). The mean interobserver agreement for 60% of the sessions was 96.9% (range, 89.8% to 99.7%). The percentage of correctly implemented steps was calculated based on the number of steps correctly completed by the
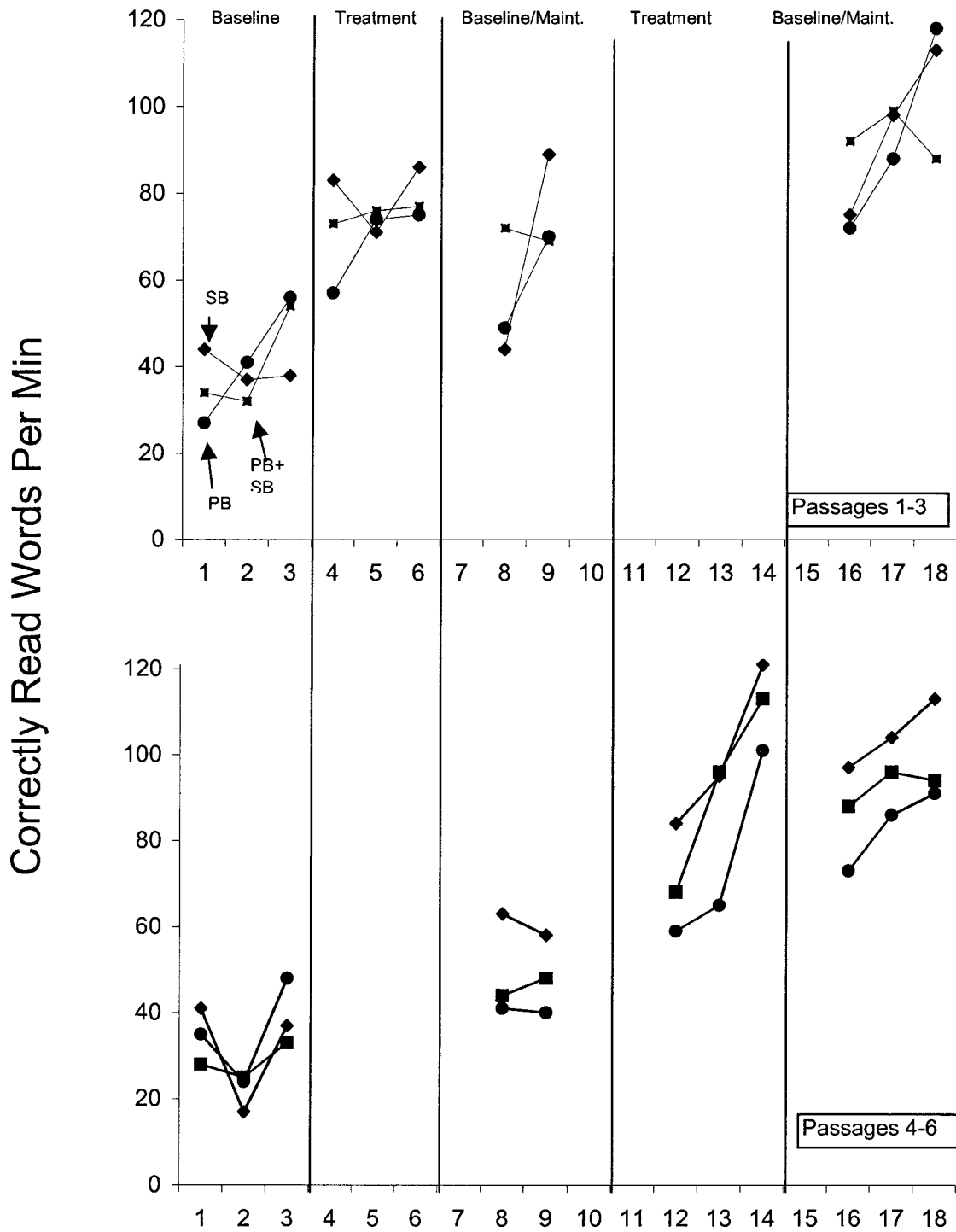
Figure 1. Rate of correctly read words for Camille. The upper panel includes the data for the first set of treated passages, and the lower panel includes the data for the second set of treated passages.

experimenter divided by the total number of steps for the experimental condition. The mean number of correctly implemented steps within sessions was 96% (range, 88% to 100%).

RESULTS AND DISCUSSION

Camille's data are displayed in Figure 1. In spite of increasing trends during baseline, responding in the two treatment phases exceeded any observed improvements during baseline phases. Greater relative treatment effects were evident in the second set of passages. Camille consistently maintained responding following the withdrawal of treatment. The results of this study attest to the efficacy of both treatment components in improving reading fluency and in promoting maintenance following instruction.

The use of a multiple probe design may help to shed some light on generalization issues that have been obscured in previous experimental analyses of reading. Although maintenance across time was the most obvious form of generalization observed in the study, closer inspection of the data suggests that treatment carried out in the second set of passages was followed by collateral increases in the first set of passages. Camille achieved a higher threshold of responding during treatment (approximately 100 CRW per minute) in the second set of passages than in the first set of passages, raising the intriguing possibility that generalization across passages may occur partially as a function of a fluency threshold.

Interestingly, no superior treatment emerged even though the combined treatment contained more elements than either of the other two treatments. Reinforcement and instructional components probably interact in complex ways that are not completely understood, which should raise con-

cern about the accuracy with which performance or skill deficits can be identified based only on brief analyses. Camille might have been reaching an asymptote for responding, a level beyond which only diminishing returns would be obtained.

There are several limitations to the study that should lead to caution in interpreting the results. First, Camille was exposed to three treatments a day during treatment weeks, which probably increased the possibility of multiple-treatment interference. In addition, frequent and repeated probing on the same passages might have increased opportunities to respond and augmented treatment effects. Finally, different results might be obtained with students who were reading at different fluency levels.

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