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TEACHING YOUNG REMEDIAL READERS TO GENERATE QUESTIONS AS THEY READ

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Poor readers are often characterized as passive learners who fail to select and apply strategies that will aid their comprehension. Activities designed to develop student use of strategies and self-monitoring may be especially helpful for students who are experiencing reading difficulty in school (Brown, Bransford, Ferrara, and Campione, 1983; Palincsar & Brown, 1984; Pearson & Gallagher, 1983).

One activity for enhancing reading comprehension is reciprocal questioning. Teaching students to reflect upon what they have read and to formulate questions about literal and implied meanings of the author can improve comprehension and encourage active monitoring. Previous investigations of reciprocal questioning in different instructional settings and with different populations suggest that this technique is appropriate for remedial readers.

Various forms of the reciprocal questioning strategy have evolved from the ReQuest procedure developed by Manzo (1968). With ReQuest, the instructor and student(s) take turns asking each other questions on a story or text. In a study with a group of remedial readers whose ages ranged from 7 to 25 years, Manzo (1970) compared the comprehension scores of students who received the ReQuest instruction and students who were taught by teacher-posed questions in a directed reading activity format. The students using ReQuest performed significantly better on two standardized comprehension tests than did the other students.

Other studies have supported the use of reciprocal questioning. Frase and Schwartz (1975) reported that college students who asked each other questions while studying

received higher scores on recall tests than students who studied alone. Also, these students performed better on text pages for which they formulated their own questions than on alternate pages which they only read. Using reciprocal questioning with groups of fifth graders, Helfeldt and Lalik (1976) found that the students who participated in the questioning activity performed significantly better on a standardized comprehension test than did those students who received only teacher posed questions. Andre and Anderson (1978-79) found that high school students with low verbal ability benefited from a program in which they were taught to generate questions about their reading.

Palincsar and Brown (1984) have completed a series of studies which investigated the effects of self-questioning when it is used in conjunction with other strategies designed to foster reading comprehension and monitoring. In their work with seventh graders, who were described as having average decoding but low comprehension abilities, they developed an interactive program in which students and teachers took turns asking questions, summarizing, clarifying, and making predictions. They reported that students increased in ability to perform on independent comprehension measures. That is, the combined treatment aided the students' ability to apply the instructed strategies to materials other than those used in the instructional program.

While previous studies have supported the use of this technique with older students, the purpose of the present study was to assess the effects of a reciprocal questioning procedure on reading comprehension for a group of young



remedial readers. It was hypothesized that the students' comprehension performance would improve after participating in a program that required them to produce questions as they read.

Method

Design

For this study, a single subject multiple baseline across subjects design was used to evaluate effects of the reciprocal questioning procedure on the reading comprehension of three students. This design was chosen to provide: (1) precise information about each student's change in ability to answer literal and inferential questions before and during the use of reciprocal questioning, and (2) information on the types of questions generated by each student during reading.

Subjects

The subjects for the study were three second grade students who were enrolled in an after-school remedial reading tutorial program of the Family and Child Study Center at George Peabody College of Vanderbilt University. The ages of the two boys and one girl were 7.11 (student I), 7.10 (student II), and 7.8 (student III). On the Gilmore Oral Reading Test, Form C (1968), students I, II, and III had a comprehension grade equivalent of 1.7, 2.0, and 1.7, respectively.

The three tutors for the program were elementary and special education majors at the university who completed an undergraduate remedial reading course. The tutors were randomly assigned to their students. Each was assigned to one student for the entire remedial program.

Materials

The materials were basal reader stories and questions written by the investigators to correspond to each story. Eleven stories were selected at random from the Ginn Reading Program (1983), level 7, which was designed for students who are in the first part of second grade. The stories were photocopied, with the accompanying illustrations, and were presented in random order to the students. Ten of the stories were divided into three relatively equivalent parts and were used for the baseline and teaching phases of the study. The stories had a mean of 451 words (S.D. =

144) and a range of 261 to 733 words across stories.

For each story two sets of questions were written independently by the investigators. Reciprocal questions, to be asked by the tutors during the reading, and post reading questions, to be asked after the reading was completed, were developed also. The questions were classified independently by each author as literal, inferential, or predictive. Literal and inferential questions were defined according to Pearson and Johnson's text explicit and text implicit classification (1978). The prediction questions were defined as those questions that, to be answered, required information found in later sections of the text. There was little deviation between the classification of questions between the two investigators. Minor discrepancies were resolved and a final list of reciprocal and post reading questions was developed for each story.

Procedure

According to the design for this study, the students were placed in baseline first to assess their literal and inferential comprehension of stories. After the baseline phase was completed for each student, the reciprocal questioning or intervention phase was initiated and daily performance on literal and inferential questions was recorded again. Changes in performance during the two phases were evaluated to determine whether improvement occurred consistently once the intervention was implemented.

A script for the sessions of both phases was provided for each tutor. In addition to describing the procedure to be followed for both phases, the script provided examples of literal, inferential, and predictive questions. Prior to the study, the tutors were taught how to follow the script to conduct reciprocal questioning during two group training sessions and individual follow-up meetings. The tutors were instructed to tape-record their teaching sessions and were told that they would be observed through one-way mirrors. All tutoring sessions were conducted twice a week for five weeks and were held under the same conditions (e.g., number and time of sessions, size of tutoring rooms, amount of observation time, and amount of conference time with supervisors). The procedure required about forty-five minutes of the one-hour tutoring time.

Reliability of procedure and scoring was evaluated in two ways. First, the authors independently observed the sessions. A comparison of the observation data revealed that there was little or no deviation from the scripts. The tutors followed the directions on the scripts 98% of the time. Also, each author scored transcripts of student responses to post reading questions taken from both phases of the study. A high inter-rater agreement, with a reliability coefficient of .98, was established. Minor discrepancies in scoring were resolved through discussion.

Specific procedures

Baseline. During baseline the tutors introduced each story by briefly discussing predictions based on the title of the story. Students read the stories orally. Tutors corrected only those miscues that seriously affected the meaning of the story and supplied words when the students hesitated during oral reading. At each of the three divisions within the story the students were asked to stop and think about what they were reading. After the students read the stories the tutors asked the post-reading questions and tape recorded the students' responses. Percent correct scores were obtained for each student on each story for the literal and inferential questions.

The number of baseline sessions increased for each student consecutively, so that change could be attributed more reliably to the intervention rather than to other factors in the students' development or environment. Student one participated in three baseline sessions, student two participated in five baseline sessions, and student three participated in six baseline sessions.

Intervention. During each session in which reciprocal questioning was used, a common procedure was followed by all three tutors. Each day before reading, the tutors explained that the student and teacher would read stories and take turns asking questions about what they read. The students were told that the questioning could help them understand the ideas of the stories. Except for the first day of this procedure, tutors then showed the students graphs of their previous performance on the post reading questions. As in baseline, the tutors then led the students in a brief pre-reading discussion and during oral reading

corrected substitutions that affected meaning or supplied words that students failed to pronounce.

When the students stopped at the division points of each story, the tutor and student alternated in asking each other a question about the material that was just read. The tutor was instructed to ask one literal, two inferential, and one predictive question for each section of the story and to record the four questions that the student asked. Tutors accepted all student questions but helped the students to rephrase statements that were not questions or supplied questions for the students if they were unable to form them. All questions asked reciprocally were answered. If the student or tutor had difficulty in answering any question, they referred to the story for the answer.

Questioning, however, rather than question answering, was emphasized. After reading, as in the baseline phase, each student was asked to answer ten comprehension questions, four at the literal level and six at the inferential level.

Generalization Passage. In order to determine whether students' comprehension improvement generalized to another story that was read independently, students were given a story selected from the same book in the Ginn series. The students read this story orally without pausing. After reading, the students were asked ten post reading literal and inferential questions.

Results and Discussion

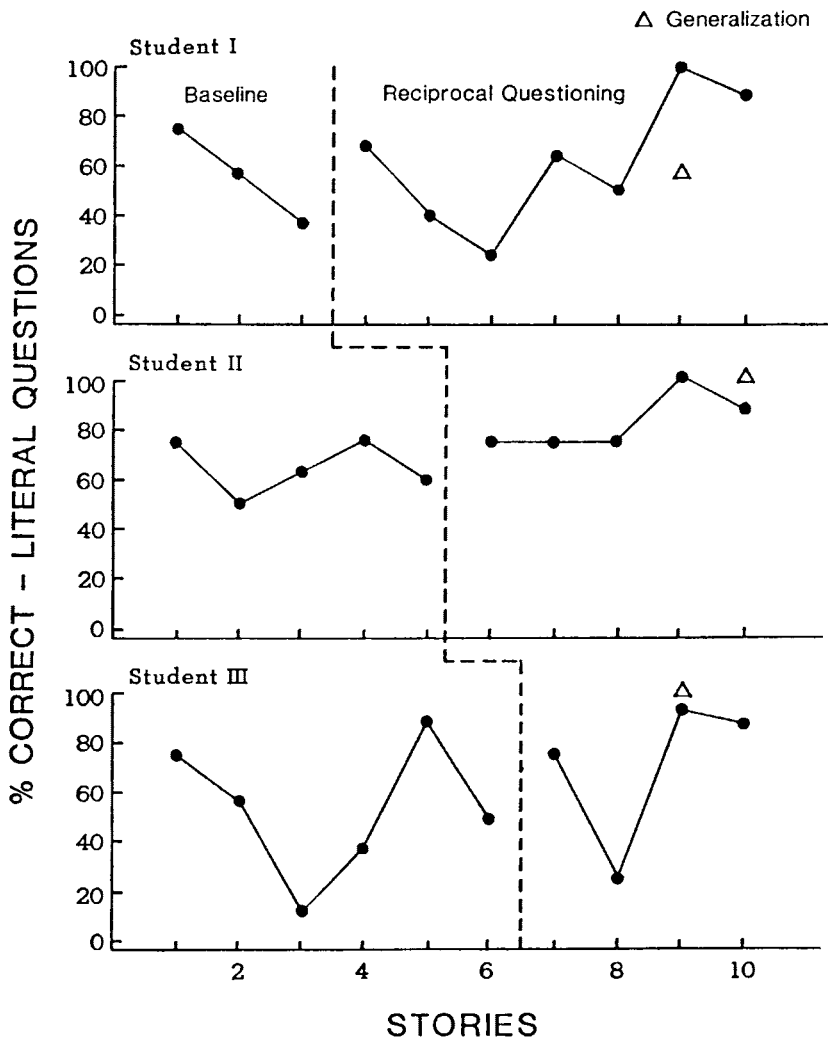
A visual inspection of the graphs reveals that the students performed differently from each other across the two phases on both the literal and inferential comprehension questions (see Figures 1 and 2). A statistical analysis using the Mann-Whitney U test, a non-parametric test for small samples, was conducted to analyze the difference between performance on post-reading questions asked during the baseline and intervention questions across the two phases (Figure 1), there was no significant difference for student I ($p < .417$), but there was a significant difference for student II ($p < .004$) and student III ($p < .033$). The analysis of performance on the inferential questions (see Figure 2) indicated a significant difference between baseline and intervention for all three students. The level of significance

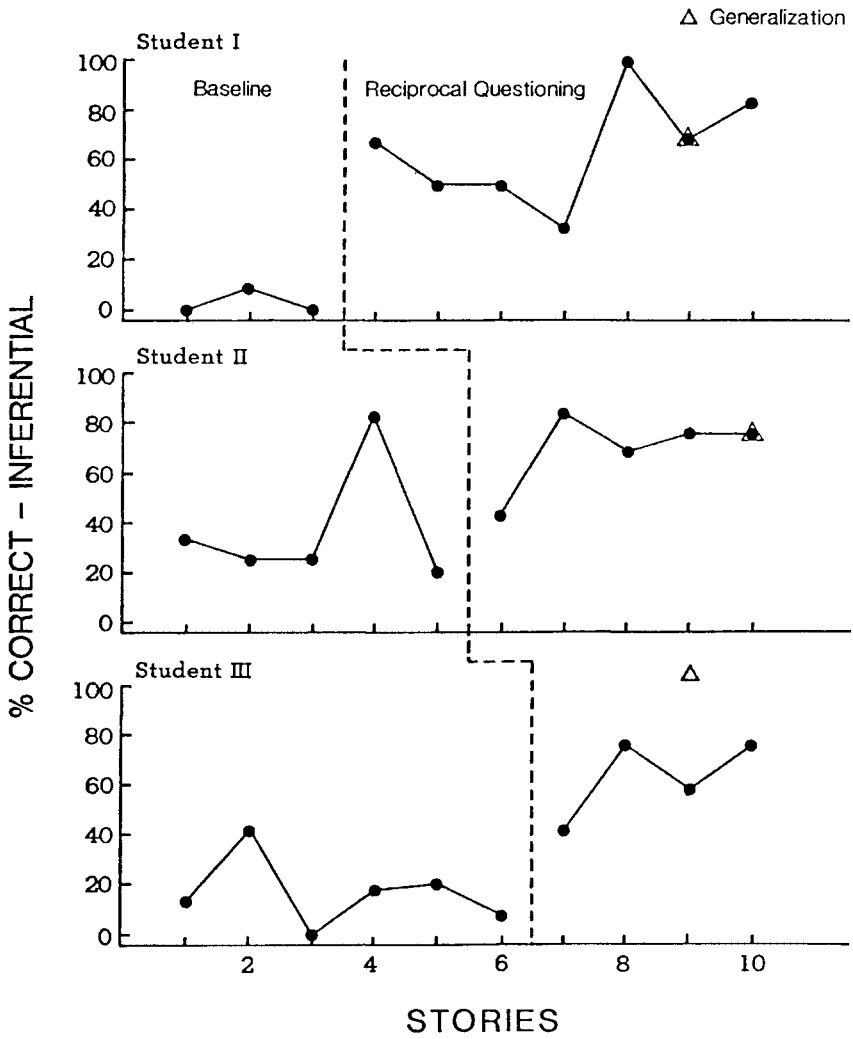
was $p = .008$ for student I, $p = .048$ for student II, and $p = .005$ for student III.

On the generalization passage, an inspection of the scores indicated variable results. On the literal questions, performance on the generalization passage for students I was similar to baseline performance, but higher than baseline for students II and III. On the inferential questions, students I and III scored substantially higher on the generalization passage than on the passages read during baseline. Student II's performance was similar to the highest score collected during baseline.

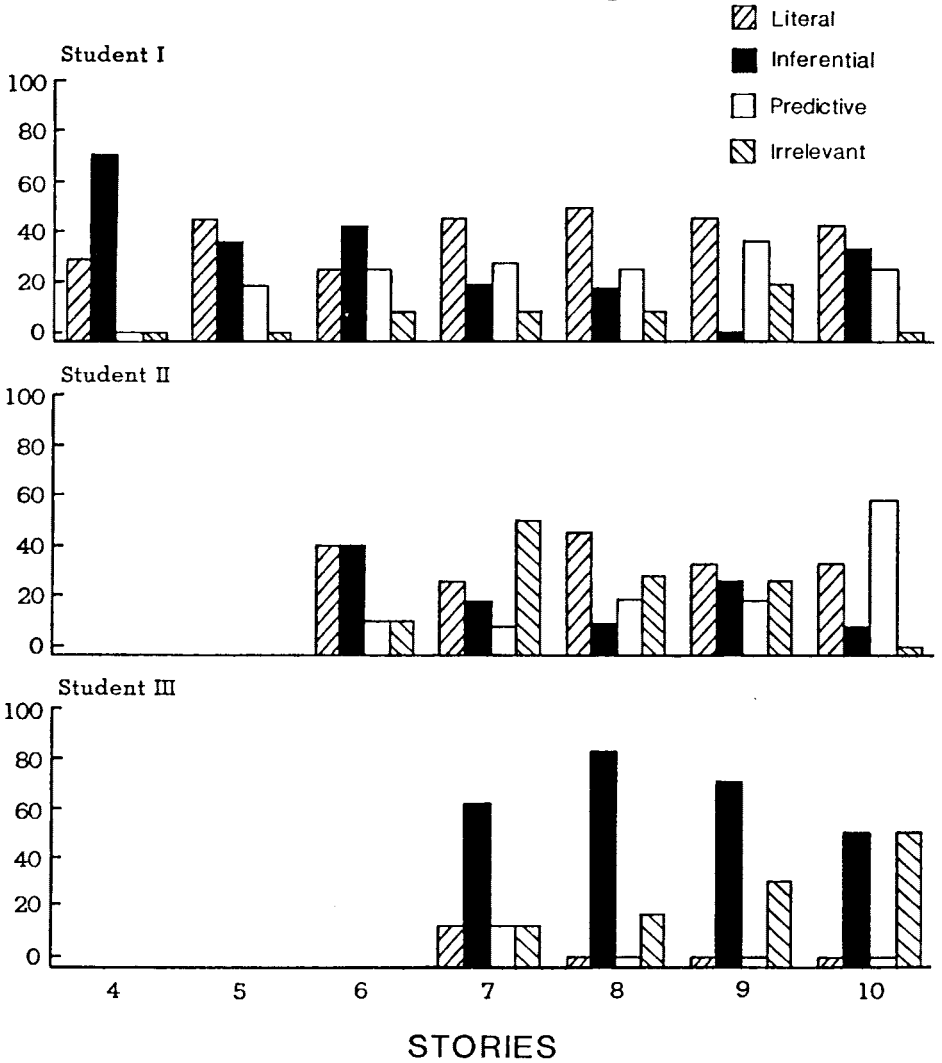
Next, the kind of questions that students asked during reading was assessed. Questions asked by the students during the reciprocal questioning procedure were transcribed and the authors judged whether they were literal, inferential, predictive or irrelevant. The irrelevant category included all questions that were unrelated to the story ideas. Inter-rater agreement was established at .92. Discrepancies were resolved through discussion. As can be noted in Figure 3, no discernible pattern of question selection was found within or across students or materials. Students varied in their selection of question and the differing content of stories did not seem to influence question selection. Student I showed an increase in the use of predictive questions across time but maintained the use of literal and inferential questions with few irrelevancies. The use of irrelevant questions was somewhat high for student III, yet this student also relied heavily on inferential questions. Student II varied the use of the four question types across stories. A correlational analysis revealed that there was no significant relationship ($p = .05$) between the type of questions asked and type of questions answered correctly by the students. As can be noted, none of the students adopted the same questioning ratio (i.e., use of one literal, two inferential, and on predictive question) as was modeled by the tutors.

These analyses indicate that the students made gains across either one or both measures of comprehension. Use of the single subject design provided the expected finding that disabled readers are heterogeneous; therefore, will respond differently to materials and questions. The findings provide support for the use of a reciprocal questioning strategy with young remedial readers. While previous studies





Reciprocal Questioning



have indicated that older readers can use this strategy to aid reading comprehension, the findings of this study suggest that reciprocal questioning can influence second graders' ability to answer literal and inferential comprehension questions. Even though the students did not adopt the same questioning strategies as their tutors, they were able to generate their own questions about the stories that they read and this seemed to contribute to their increased comprehension scores. The results of this study suggest that providing direct instruction on a selected strategy may result in students' active use of this strategy to enhance their learning. To be investigated further is whether intervention conducted over a longer period of time would contribute to independent generalization of this strategy to other written materials.

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