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ABSTRACT

A study examined how topic interest and brief metacognitive strategy instruction affected learning from reading. Subjects were 81 third graders (33 females, 48 males) randomly assigned to 4 groups. All the students attended 1 of 10 third-grade classes in an elementary school located in a middle- and lower-socioeconomic status area in central Georgia. The students participated in an 8-week instructional program in which half of the children received metacognitive instruction and half of the children received no instruction. Half of the children in each group read in areas of their interest and half read in areas that were not of interest. Brief metacognitive strategy instruction, and not topic interest, was found to have the only effect on children's ability to recall information from texts they had read. Children in the metacognitive strategy instructional program were likely to reread books if they had low prior knowledge in the subject area. This was not the case for children in the control group. (Contains 22 references and 2 tables of data.) (Author/RS)

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The work reported herein is a National Reading Research Project of the University of Georgia and University of Maryland. It was supported under the Educational Research and Development Centers Program (PR/AWARD NO. 117A20007) as administered by the Office of Educational Research and Improvement, U.S. Department of Education. The findings and opinions expressed here do not necessarily reflect the position or policies of the National Reading Research Center, the Office of Educational Research and Improvement, or the U.S. Department of Education.

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Brief Metacognitive Intervention and Interest as Predictors of Memory for Text

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Abstract. *This study was designed to examine how topic interest and brief metacognitive strategy instruction affect learning from reading. Third-grade children participated in an 8-week, instructional program in which half of the children received metacognitive instruction and half of the children received no instruction. Half of the children in each group read in areas of their interest and half read in areas that were not of interest. Brief metacognitive strategy instruction, and not topic interest, was found to have the only effect on children's ability to recall information from texts they had read. Children in the metacognitive strategy instructional program were likely to reread books if they had low prior knowledge in the subject area. This was not the case for children in the control group.*

Reading is a process by which individuals obtain information for the purposes of enjoyment or learning. Reading is, therefore, not a goal but a means to a goal. To date, most instructional studies (e.g., Borkowski, Wehying, & Carr, 1988) have comprised instructional packages in which children are taught how to use metacognitive strategies on age-appropriate passages selected by the researcher: interest was not manipulated. If reading is a means to an end, then the possession of appropriate metacognitive knowledge should have the strongest impact on reading comprehension when children's reading is goal-directed.

A substantial body of research attests to the importance of strategy and metacognitive knowledge for reading achievement (e.g., Brown, 1980; Paris, Lipson, & Wixson, 1983). We know that developing metacognitive knowledge is linked to increases in strategy knowledge and achievement (Meloth, 1990), and that learning-disabled and underachieving readers benefit from reading strategy and metacognitive instruction (e.g., Borkowski et al., 1988; Carr & Borkowski, 1989). Because young children often require explicit metacognitive information about the utility of strategies (Kennedy & Miller, 1976; Pressley, Levin, & Ghatala, 1984), and do a poor job of identifying and studying important text (Brown & Smiley, 1977, 1978), metacognitive information about reading strategies, the importance of different parts of text, and feedback about

performance are necessary for children to gain expertise. In sum, metacognitive knowledge allows children to become engaged readers by providing children with the skills and knowledge to improve and monitor comprehension.

Motivation in the form of interest is also expected to be necessary for children to gain expertise within a domain. Children are better able to comprehend text that interests them (Asher, Hymel, & Wigfield, 1978; Baldwin, Peleg-Bruckner, & McClintock, 1985; Stevens, 1980). This occurs because interest promotes the use of cognitive processes, such as learning strategies (Pressley, El-Dinary, Marks, Brown, & Stein, 1992; Schiefele, 1991). For example, children who are interested in a topic are more likely to recall more elaborate information about a topic and to be more strategic (Tobias, 1994). In theory, children who are interested in a topic should be motivated to acquire and use metacognition and strategies as means to learning more about the topic. This interest, in combination with increasing skills and knowledge, should promote the maintenance of strategies and substantial increases in knowledge. The successful use of these skills, in turn, promotes feelings of competence. Thus, interest determines whether or not children will become engaged in their reading by being motivated to use metacognitive knowledge and strategies as means to purposeful reading.

This study was designed to examine how topic interest and brief metacognitive strategy instruction affect learning from reading. This was done because no research to date has examined the combined effects of metacognitive strategy instruction and interest on reading performance. It was also designed to examine the role of interest in the reading performance of young elementary-school children, in this case, third graders because the majority of research on interest has focused on older children. Although there is some evidence that interest affects memory performance in very young children (Renninger & Wozniak, 1985), it is not clear how or whether interest can help young children improve their ability to learn from text.

For this study, third-grade children participated in four brief instructional sessions over an 8-week period in which half of the children received metacognitive strategy instruction and half of the children participated in a control group. Half of the children in each group read in areas of their interest and half read in areas that were not of interest. As a part of the program, the children were allowed to select the books they would read, because choice in topic has been shown to improve the influence of interest (Alexander, Kulikowich, & Jetton, 1994; Pressley et al., 1992).

It was expected that interest alone would not suffice to produce substantial increases in learning. In order to learn from text, children should not only be interested in a topic but also possess metacognitive information about what they know, what they need to know, and how to choose appropriate strategies for obtaining this information. Thus, children who possessed topic interest in a subject and were given metacognitive strategy instruction were expected to show superior recall of information from the text.

Method

Subjects

Eighty-one third graders (33 female, 48 male) participated in the 9-week study. All the students attended 1 of 10 third-grade classes in an elementary school in central Georgia. The children came from middle- and lower-socioeconomic status homes. The average age of the participants was 9 years and 1 month (SD = 5 months). The ages ranged from 8.1 to 10.0 years. Only subjects with parental permission were allowed to participate. Ten children did not complete the study due to illness or failure to complete all of the materials.

Design

Students were divided into four groups: (1) high topic interest with metacognitive strategy instruction; (2) low topic interest with metacognitive strategy instruction; (3) high topic interest with no instruction; and (4) low topic interest with no instruction. Students were initially pretested for their knowledge of the to-be-learned topic material. During the next 8 weeks, students met in small groups for 20-min sessions. During weeks 1, 3, 5, and 7, children in the metacognitive strategy instructional groups were taught four metacognitive strategies for improving reading comprehension. These children also chose books to read on their assigned topic. All strategy instruction was developed with the help of three certified elementary-school teachers to insure a proper level of instructional method and language was used to teach the strategies. Comprehension tests for the books read were given to all four groups on weeks 2, 4, 6, and 8. The no-instruction groups read their books for 20-min sessions on weeks 1, 3, 5, and 7 and after their comprehension tests on weeks 2, 4, 6, and 8. In week 9, the posttest was administered to all subjects.

Materials and Procedure

Assignment to condition. Seventeen students participated in the metacognitive instruction–high interest group, 8 students participated in the metacognitive instruction–low interest group, 8 students participated in the no instruction–high interest group, and 8 students participated in the no instruction–low interest group. Ten classrooms participated in the study. Due to differences in the number of children participating in each class (some classes had fewer students participating than others) and differences in teachers' schedules, children were divided into only two of the four possible conditions. Creating groups based on classroom availability did not result in unequal ability groupings, because children were assigned to classrooms randomly by order of registration in summer (data collection occurred during the school year). Status, such as being in special education programs, did not affect class assignment.

Assignment of topics. Six months prior to the beginning of the study, children in a third-grade classroom in an elementary school in Clarke County, Georgia, were surveyed to determine potential topics of interest. Eight

topics (dinosaurs, presidents, computers, Indians, outer space, insects, whales, and dogs) were found to be of very high or low interest to the Clarke County third graders. These eight topics then were presented to the children in this study as potential topics of high or low interest.

Following the group assignment, the children were asked to rate each of the eight topics for their interest value. For each of the eight items, the children had to determine whether they liked to read about the topic a lot, sort of, or not at all. Based on these responses, children in the high-interest groups were assigned to read a topic they rated as being interesting, and children in the low-interest groups were assigned to read a topic they rated as being uninteresting. In order to prevent the confounding of interest and topic, the same topics were assigned to high- and low-interest groups. For example, children who were highly interested in dinosaurs and children who were not interested in dinosaurs both read about dinosaurs. Children in the high-interest group rated their topics on average as being highly interesting (2.90), and children in the low-interest group rated their topics on average as being uninteresting (1.30). In total, three of the eight topic areas (computers, dinosaurs, and insects) were used in the study. There were no group differences in the types of topics children read. That is, an equal number of children in each condition read about a given topic. There were no sex differences in children's preferences for topics. The average reading grade-levels of the texts for the three topic areas were 3.4 for computers, 3.6 for dinosaurs, and 3.2 for insects.

Reading materials in each of the three topic areas were selected from Children's Books in Print (Bowker, 1993). Books listed as having a reading grade-level of kindergarten through sixth grade were used. The reading material gathered for each topic represented an approximately equal range of difficulty. In all, 40 books were read by the children.

Pretest of prior knowledge. Prior to beginning the instruction, the students were given a pretest in their topic area for prior knowledge of the topic. Pretest questions for each topic were derived from the reading materials to be used during the instruction. Two or three questions were created from the information in each book. Each multiple choice question had three possible responses. Questions and answers were evaluated for readability, difficulty, and appropriateness to third graders by two certified elementary-school teachers prior to testing the subjects. In order to avoid ceiling effects, students who correctly answered more than 15 of 25 questions were reassigned to another topic, based on their responses to the interest survey and group assignment (interest or no-interest), and were retested in the new topic area. Two students had to be reassigned and retested.

The Instructional Program

Session 1. All students were given a brief overview of the study, in which they were told that the purpose of the study was for each student to become an expert in his or her topic

by reading books. Students in the instructional groups were given additional information. These students were taught to activate prior knowledge and refer new information to existing knowledge by writing down the answers to the following three questions: "What do you already know about your topic?"; "What do you hope to learn about your topic?"; and "Do you think what you learn by reading your books will change what you already know about your topic?" The children were encouraged to discuss their answers aloud. Next, students wrote the words "think," "learn," and "change" on their papers and were told to look at those words while reading their books to remember the lesson. Finally, students were allowed to choose books in their topic to take home to read as homework. As each book was recorded, students were told the difficulty of the book, and the appropriateness of the number of books they had chosen was discussed. Before returning to class, students were reminded that they would have their quiz on these books at the next session.

Students in the no-instruction groups were told to choose as many books from their topic area as they wanted to read during the following week as homework. The children read these books during the session, but no instruction was given. Before returning to class, students were reminded that they would have their quiz on these books.

A total of 47 books was available for the children to read. On average, children read six books during the intervention. No group differences were found in the number of books read by the children.

Sessions 2, 4, 6, and 8. During these sessions, the children were quizzed about the books they had just read. Each quiz contained five questions drawn from the books they had read during the prior week. For the no-instruction groups, upon completing their quizzes, the students were instructed to choose books for the next week and to read until the session was completed. Before returning to class, students were reminded to read the books carefully and that there would be a quiz for these books in two weeks' time.

For the instruction groups, after the students completed their quizzes, the strategy for the previous session was reviewed. They were then instructed to choose books for the week. Before returning to class, students were reminded to read the books carefully and that there would be a quiz on the books they had taken home.

Session 3. The students participating in the instruction groups first discussed what new information they had learned. Next, the children were taught how to identify key words in a paragraph. They were told that authors use bold or italic typeface to stress an important word or to denote a word that is being defined in the paragraph. Students were also taught to identify headings as the description of the new topic to be discussed in subsequent paragraphs. The children practiced identifying bold and italic typeface and headings and described why these were used in illustration paragraphs. Examples were written on a 16" χ 24" teaching tablet. After the lesson, the children chose books to read at home, were given feedback about the books, and were reminded that quizzes

Table 1. Means and Standard Deviations (in parentheses) for Pretest, Posttest, and Summed Quiz

	Pretest	Posttest	Quiz	Rereads
High Interest Instruction $n = 17$	12.71 (2.42)	12.89 (3.25)	8.93 (2.34)	1.80 (0.91)
Control $n = 18$	11.28 (3.38)	13.17 (3.81)	6.83 (2.96)	1.20 (1.06)
Low Interest Instruction $n = 18$	12.00 (2.38)	12.17 (3.33)	8.23 (3.07)	0.95 (1.30)
Control $n = 18$	12.33 (2.43)	13.28 (3.08)	7.21 (3.28)	1.00 (0.97)

would be given at the next session for those books and for the books they had just returned. The procedure for the no-instruction groups was exactly the same as in session 1.

Session 5. The children participating in the metacognitive instruction groups first discussed what new information they had learned that week from their books; the children were then taught to use the structure of a paragraph to improve recall by identifying topic sentences. The students were given the definition of a topic sentence as the sentence that tells the main idea of a paragraph. They were told that the topic sentence is usually the first or last sentence of the paragraph and is a general statement that describes the rest of the sentences. Illustration paragraphs from a text, written on the teaching tablet, served as practice tools for identifying topic sentences and stating the main ideas of paragraphs based on information in the sentences. After the lesson, the children chose books to read at home, were given feedback about the books, and were reminded that quizzes would be given at the next session for those books. The procedure for the no-instruction groups was exactly the same as in session 1.

Session 7. The students in the metacognitive instruction groups first discussed what new information they had learned that week from their books. The students then were asked to choose their "homework" books for the week to use for the lesson. During this session, the children were taught how to outline text headings, words in bold and/or italic, and topic sentences rewritten in their own words. A sample outline using the terms "heading," "bold/italic," and "topic sentence" was written on the teaching tablet. The students were then instructed to find an example of each of these terms in their books and to state where in the outline their example would fit. Before returning

Table 2. Correlations Among Pretest, Posttest, Quiz Scores, and Rereading for the Metacognitive Instruction Groups and the No-Instruction Groups

	Pretest	Posttest	Quiz	Reread
Instruction				
Pretest	1.00			
Posttest	.17	1.00		
Quiz	-.26	.35*	1.00	
Reread	-.39*	-.02	.04	1.00
No-Instruction				
Pretest	1.00			
Posttest	.61**	1.00		
Quiz	.18	.39*	1.00	
Reread	-.12	-.04	.08	1.00

*$p < .05$. **$p < .01$.

to class, the students were reminded that quizzes would be given at the next session. The procedure for the no-instruction groups was exactly the same as in session 1.

Session 9 (all groups). All students were given quizzes for the books selected at session 8 and were administered the posttest. The posttest was the same test given for the pretest.

Results

Means and standard deviations for pretest, posttest, the summed quiz scores, and the number of rereads are presented in Table 1. As can be seen from the pretest and posttest means, no significant interest or metacognitive group differences occurred. The pretest and posttest for each topic were made up of questions selected from all of the books available for the children to read. Since students were allowed to select books to read, it is possible that they missed critical information assessed by these tests.

Since the quizzes were based on the books the children had recently read, data from children's quizzes provided information about the immediate impact of the instruction on their ability to learn from text. Children's quizzes consisted of only 5 points per quiz. The data for the quizzes were collapsed over all sessions to create a total score. A 2 (instruction) by 2 (interest) Analysis of Covariance (ANCOVA), with children's pretest scores as a covariate, indicated a main effect for the instruction condition, $F(1, 66) = 4.81, p < .05$. Children who received metacognitive strategy instruction ($M = 8.56$) were more likely to remember information from the text that they had just read than children who did not receive instruction ($M = 7.02$).

Although strategy use was not directly measured in this experiment, the number of

times children chose to reread a book was calculated by summing the number of times children requested to reread a text. There were no significant group differences in the number of times children in each condition chose to reread a book; however, an examination of correlations indicates that children in the instruction conditions were more likely to reread books if their pretest scores were lower, $r = -.39$, $p < .05$. This correlation did not exist for the no-instruction groups. Furthermore, the lack of correlation between pretest and posttest scores for the metacognitive instruction groups and the significant correlations between pretest and posttest scores for the no-instruction groups indicated that the instruction was affecting children's ability to gain information from text. Correlations for the metacognitive instruction and no-instruction groups are presented in Table 2.

Discussion

It was originally hypothesized that interest and metacognitive strategy knowledge would interact to produce better performance on tests of knowledge gained from reading. However, metacognitive strategy instruction, and not interest in a topic area, appeared to have the only effect on children's ability to recall information from the texts they read. Although there was no direct measure of strategy use, children in this metacognitive instruction group were more likely to reread books if they started off the program with poor topic knowledge, suggesting that, through instruction, these children were made aware of discrepancies in their knowledge and the need to reread. Pretest was the best predictor of posttest for the control group, but this was not the case for the instruction group.

These data show the power of metacognitive strategy instruction to improve children's ability to gather and remember information from text. Even children who were not interested in the topic were able to improve their ability to learn from text during the program. Given that Pressley, Borkowski, and Schneider (1987) and Schiefele (1992) hypothesize that cognitive skill mediates the effects of motivational constructs on performance, it may be that children first need to develop skill before interest can have an impact on performance. In the case of third-grade children, cognitive skill and not interest may be the more critical variable in determining success in learning through reading.

For such young children, reading may still be a major challenge, and interest may not facilitate the effects of reading because of the amount of attention children need to focus on the process of reading. Interest has not been found to promote performance in non-automated procedures, such as writing, in older children (Hidi & McLaren, 1990). Nevertheless, cognitively immature or less experienced readers need help processing text and may actually be sidetracked by interesting tidbits of information that are not highly relevant (Alexander, Kulikowich, & Schulze, 1994). A similar effect may be occurring with these data, with children benefiting from the effects of the instruction of metacognitive strategies, which promote non-automatic reflective behavior, but not

benefiting from the effects of interest because of the lack of automaticity in reading.

This is not to say that metacognitive strategy instruction and the effects of interest conflict with each other. In fact, interest appears to have similar effects as metacognitive strategy instruction on the reading performance of older children. For instance, children who are interested in a subject are more likely to use strategies and to create elaborate, deeply processed representations from text (Tobias, 1994). Younger children simply may not be capable of using their interest in a topic to create elaborate representations.

The failure to find interest effects in this experiment should not be interpreted to mean that interest does not affect young children's performance. Preschool children are better able to remember objects that are of interest to them (Renninger & Wozniak, 1985). This study differed from prior studies in that it examined the impact of topic interest over a 9-week period of time as opposed to a single session. It may be that the topic interest of third-grade children is not sufficiently stable to produce interest effects over a 9-week program. Other forms of interest, such as situational interest, may have a different effect on reading performance.

This study had several limitations. The length of training was short. This may have resulted in the failure of interest to have an impact on reading comprehension. Furthermore, although the children selected their own books in the study, we did not assess children's interest in the books they selected. It may be that they did not maintain interest in the topic in general, or they may not have found individual books interesting. Interest may be situation- or task-specific, particularly for young children. In this case, assessing interest for each book selected by the children would have provided a better understanding of the role of interest in reading achievement.

Although these data do not support the importance of interest in reading comprehension, it cannot be said that interest is never an effective motivator for reading. The role of interest as a motivator of good reading performance has yet to be fully explored. Interest may be useful for promoting learning in children who have automated skills and for older children. Similarly, interest may promote learning for less challenging texts and tasks. It remains to be seen exactly how, when, and why interest improves performance.

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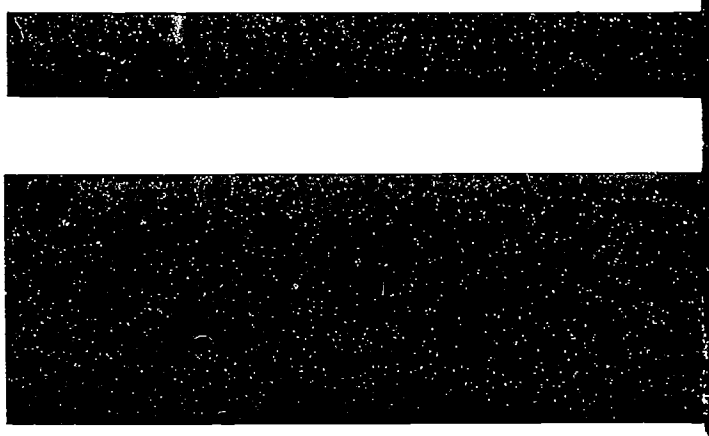

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