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ABSTRACT

A study investigated the effects of verbalizing comprehension strategies on reading achievement, self-efficacy, and ability attributions of 26 children in grades four and five. The subjects, who had reading comprehension deficiencies, received instruction practice and opportunities. Within each grade, half of the subjects verbalized strategies prior to applying them to a reading passage and its accompanying questions, and the other half did not. A comparison of pretest and posttest scores on a variety of measures indicated that strategy verbalization led to higher reading comprehension, self-efficacy, and ability attributions across the two grades. Self-efficacy and ability attributions were positively related to one another and to subsequent performance. The findings suggest that the verbalization strategy should be applied to other reading skills. (Author/FL)

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Strategy Self-Verbalization: Effects on Remedial Readers' Comprehension and Self-Efficacy

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Abstract

This experiment investigated the effects of verbalizing comprehension strategies on reading achievement, self-efficacy and attributions. Children in grades four and five with reading comprehension deficiencies received instruction and practice opportunities. Within each grade, half of the subjects verbalized strategies prior to applying them, whereas the other half did not verbalize strategies. Strategy verbalization led to higher reading comprehension, self-efficacy and ability attributions across grades. Self-efficacy and ability attributions were positively related to one another and to subsequent performance. Results suggest applying strategy verbalization to other reading skills.

Strategy Self-Verbalization: Effects on Remedial Readers' Comprehension and Self-Efficacy

According to Bandura, different psychological procedures change behavior in part by creating and strengthening perceived self-efficacy, which refers to personal judgments of performance capabilities in a given domain of activity that may contain ambiguous, unpredictable, and stressful features (Bandura, 1977, 1982a, 1982b). Self-efficacy is hypothesized to influence choice of activities, effort expended, persistence, and task accomplishments. People acquire information about their self-efficacy from actual performances, observation of others, persuasion, and physiological indexes (e.g., heart rate).

Although self-efficacy originally was employed to explain coping behaviors in fearful situations, its use has been extended to other contexts including children's cognitive skill acquisition (Schunk, 1984). This latter research, which has explored how children acquire information about their efficacy, has shown that educational practices (e.g., rewards, goals, feedback) are important influences on self-efficacy and differ in the type of information they convey. In turn, self-efficacy affects skill development.

One common educational practice is modeling. Although modeling can teach new skills (Rosenthal & Bandura, 1978), there is little research on how modeling affects self-efficacy. Modeling is an observational source of information about one's self-efficacy (Bandura, 1977, 1982b). People who observe others succeed at a task may experience higher self-efficacy because modeling implicitly conveys that observers possess the capabilities to perform well and will succeed if they follow the same

sequence of actions (Schunk, 1984). This sense of efficacy acquired vicariously is validated later when observers perform the task successfully.

Modeling also can teach general rules and problem-solving strategies (Zimmerman & Rosenthal, 1974). Modeled demonstrations that include verbalized rules or strategies, along with applications, can be internalized by observers to help regulate their performances (Meichenbaum & Goodman, 1971; Zimmerman & Rosenthal, 1974).

Recent research has extended this thinking by exploring how verbalization by observers, which is patterned after modeled verbalizations, affects observers' performances and self-efficacy (Schunk, 1982; Schunk & Rice, in press). Verbalization by observers should enhance performance because it could help them attend to important task features and, as a form of rehearsal, could assist strategy encoding and retention (Schunk, 1982). Because verbalization is a means of regulating one's performances, it might convey a greater sense of personal control over outcomes, which should promote self-efficacy (Bandura, 1982a). In support of these ideas, Schunk (1982) found that low achieving children who verbalized division solution strategies and their application to problems developed higher self-efficacy and skills compared with children who did not verbalize. Using language-deficient children in grades two through four, Schunk and Rice (in press) showed that verbalization of modeled listening comprehension strategies promoted self-efficacy across grades and performance among third and fourth graders.

Despite this evidence, other research has yielded mixed results on the effects of verbalization. Research shows that performance is

facilitated when children verbalize strategies to be followed, material to be recalled, or other types of performance aids (Asarnow & Meichenbaum, 1979; Coates & Hartup, 1969; Keeney, Cannizzo, & Flavell, 1967; Whitely & Taylor, 1973). Conversely, no benefits of overt verbalization have been obtained (Coates & Hartup, 1969; Denney & Turner, 1979), and there is some evidence that verbalization can interfere with performance (Denney, 1975).

Drawing a conclusion is difficult because these studies differed in age and type of subjects, type of verbalization, and experimental tasks. One factor that may be important is children's cognitive status. Verbalization may be most beneficial for children who typically perform in a deficient manner (Denney & Turner, 1979). Such subjects ordinarily may not employ suggested performance strategies or rehearse material prior to recall. Thus, positive effects of verbalization on performance have been obtained with children who do not rehearse spontaneously (Asarnow & Meichenbaum, 1979; Keeney et al., 1967), impulsive subjects (Meichenbaum & Goodman, 1971), the educable mentally retarded (Whitely & Taylor, 1973), and low achievers (Schunk, 1982; Schunk & Rice, in press). Verbalization of strategies or other task material may help reduce these children's cognitive deficiencies.

Verbalization may not facilitate performance when children otherwise can handle the task demands. Because verbalization constitutes an additional task, it even could hinder performance if it distracted children from the primary task. For example, Denney (1975) modeled performance strategies for 6-, 8-, and 10-year-olds on a 20-questions task. Older children who verbalized strategies while they performed

scored no better than children who did not verbalize, and verbalizing interfered with performance among 6-year olds. Verbalizations consisted of specific strategies, which apparently were too distracting for the youngest children.

The purpose of the present study was to determine the effects of verbalization of modeled strategies among children with reading comprehension deficiencies. Research shows that children with low reading skills perform poorer on short-term memory tasks compared with skilled readers (Bauer, 1977; Cummings & Faw, 1976; Goldman, Hogaboam, Bell, & Perfetti, 1980). Poor readers often do not use cognitive strategies such as rehearsal, elaboration, or imagery, to improve memory (Bauer, 1977; Torgesen & Goldman, 1977). It has been suggested that children with low reading skills be taught comprehension strategies, such as self-questioning, comprehension monitoring, imagery, and text scanning, to help reduce comprehension deficiencies (Brown, Campione, & Day, 1981; Singer & Donlan, 1982). Verbalization may be a means of teaching useful strategies.

It was expected that strategy verbalization would promote reading comprehension performance and self-efficacy. To extend the generality of the present findings, subjects were children in grades four and five. No hypothesis was advanced on whether verbalization would influence outcomes differently in the two grades, because there was no prior evidence using the present task and type of subjects.

This study also explored how verbalization of modeled strategies affected performance attributions. Attributional theories postulate that individuals make causal ascriptions for the outcomes of their

actions (Heider, 1958). In achievement contexts, outcomes often are attributed to ability, effort, task difficulty, and luck (Weiner, 1979). Expectancies of future success (i.e., self-efficacy) in part depend on ascriptions for prior outcomes (Weiner, 1979). Students who attribute prior successes primarily to high ability should hold higher expectancies of success compared with those who stress factors over which they have little control, such as low task difficulty or good luck. Compared with skilled readers, children with comprehension deficiencies take less personal responsibility for successes (Butkowsky & Willows, 1980); that is, they are less likely to attribute success to ability (an internal cause) and more apt to believe that success occurred largely because the task was easy or they were lucky.

It was predicted that strategy verbalization would promote attributions for success to internal causes (ability and effort), because verbalization was expected to enhance children's self-perceptions of greater personal control over outcomes. As before, no hypothesis was advanced on whether differential attributional patterns would emerge in the two grades.

Method

Subjects

The subjects were 48 children drawn from three elementary schools within one school district. The 22 boys and 26 girls were equally distributed among grades four and five. Ages ranged from 9 years 6 months to 13 years 6 months (grade four $M = 10.6$ years, grade five $M = 11.7$ years). Although different socioeconomic backgrounds were represented, children predominantly were lower-middle class.

All subjects regularly received remedial reading comprehension instruction. Children had been placed in these classes based on the following criteria: Fourth graders scored in the lowest 15% of the normed population on the language portion of the Short Form Test of Academic Aptitude (Sullivan, Clark, & Tiegs, 1970), and fifth graders scored at least two years below grade equivalent on the reading comprehension subtest of the Iowa Tests of Basic Skills (Lindquist & Hieronymus, 1972).

Pretest

Subjects initially were administered the pretest individually by a female adult tester drawn from outside the school.

Self-efficacy. Children's self-efficacy for answering reading comprehension questions correctly was measured following procedures of previous research (Schunk, 1982; Schunk & Rice, in press). The efficacy scale ranged from 10 to 100 in 10-unit intervals from high uncertainty (10), to complete certitude (100). Children initially received practice by judging their certainty of successfully jumping progressively longer distances ranging from a few inches to several yards. In this concrete fashion, children learned the meaning of the scale's direction and the different numerical values.

Following this practice, children read 10 passages one at a time. Passages ranged from 5 to 21 sentences; two passages each were appropriate for grades two through six (Cohen & Foreman, 1978). Each passage was followed by one to four questions that tapped comprehension of details (i.e., factual information in the passage). The 10 passages included a total of 24 questions. Passages and questions corresponded

in difficulty to those on the ensuing skill test although they were not identical. After reading each passage, children read its questions one at a time. For each question, children privately judged their certainty of being able to answer correctly questions of that type; that is, questions about as easy or hard as that one. Thus, children were judging their capability to answer different types of questions and not whether they could answer any particular question. So that children would not actually answer the questions, children were not allowed to consult passages, and questions were shown without multiple-choice answers. Children were advised to be honest and mark the efficacy value that matched how they really felt. Scores were summed across the 24 judgments and averaged.

Reading comprehension skill. The skill test, which was administered immediately following the efficacy assessment, included 10 passages with 24 questions that ranged in difficulty as above. The tester presented the passages one at a time. After children read each passage, they answered from one to four multiple-choice questions. Children were given no assistance or performance feedback. The test took about 30 min to administer. The measure of skill was the number of questions answered correctly.

Training Procedure

Following the pretest, children were blocked by grade and assigned randomly within sex and school to one of two experimental conditions ($n_s = 24$): strategy verbalization or no strategy verbalization. All children received 30-min training sessions over 20 consecutive school days, during which they worked on instructional materials that were

drawn from a variety of sources and that tapped comprehension of details.

Children met in groups of three around a table with a female adult proctor who was drawn from outside the school. Written on a nearby poster board were the following strategies:

What do I have to do? (1) Read the questions. (2) Read the story, and (3) Look for key words. (4) Reread each question, and (5) Answer that question. (5) Reread the story if I don't know the answer.

At the start of the first training session, the proctor distributed instructional materials and pointed to the poster board. She explained that these steps helped children answer questions. The proctor verbalized aloud, "What do I have to do? Read the questions." The proctor then read aloud the questions for the first comprehension passage while children followed along, after which she pointed to and verbalized strategies (2) and (3). The proctor explained that key words referred to material addressed in the questions, and then read the passage aloud. She next pointed to and verbalized strategies (4) and (5), read aloud the first question and its multiple-choice answers, selected the correct answer, and explained her selection by referring to the passage. The proctor repeated strategies (4) and (5) for each question based on that passage.

Treatment Conditions

Strategy verbalization. Following this modeled demonstration, the proctor instructed children to repeat aloud each strategy after she verbalized it. She then said, "What do I have to do? Read the ques-

tions." After children verbalized these statements, she selected one child to read the questions aloud. When this child finished, the proctor instructed children to repeat after her strategies (2) and (3). The proctor then called on a different child to read the story aloud, after which she asked children to repeat strategies (4) and (5) after her. A third child read the first question with its multiple choices and selected an answer. If an incorrect answer were selected, the proctor told the child to repeat strategy (6) after her, after which this child reread enough of the passage to determine the correct answer. Strategies (4) and (5) were verbalized for additional passage questions, and the entire sequence was repeated for each new passage. If children stumbled on a word during reading the proctor prompted with context and phonetic cues.

Beginning with the second session the proctor did not verbally model strategies but explained that when she pointed to a step children were to say it aloud. Proctor instructions were scripted to insure standardized implementation. Occasional observations by the authors confirmed that procedures were properly implemented.

No strategy verbalization. These procedures were identical to the above except that children did not verbalize the strategies. After the proctor verbalized the appropriate strategies she asked children to perform them (e.g., read the questions, read the story). These instructions also were scripted and class observations showed that they were followed properly.

Attributions

Children's attributions for their performances during training were

assessed on the day following the last session. Four scales were shown on a sheet of paper; each scale ranged in intervals of 10 from "not at all" (0), to "a whole lot" (100). The four scales were labeled "good at it" (i.e., ability), "worked hard" (effort), "easy questions" (task), and "lucky" (luck). Label order was counterbalanced across subjects.

The tester explained to each child individually that this paper showed four things that can help children answer questions. The tester described the scale and each of the attributions, and provided examples of how hypothetical children might mark each scale. Children were advised to think about their work during the training sessions and to mark how much they thought each factor helped them answer questions. Children also were told that their marks did not have to add to a certain number (e.g., 100). Children privately recorded their ratings.

Posttest

The posttest was administered the following day. The instruments and procedures were similar to those of the pretest except that parallel forms of the efficacy and skill tests were used to eliminate possible question familiarity. For any given child, the same tester administered the pretest, posttest, and attributional assessment, had not served as the child's training proctor, and was unaware of the child's experimental assignment. Tests were scored by a different adult who was blind to children's treatment conditions.

Results

Means and standard deviations of all measures are presented by experimental condition in Table 1. Preliminary analyses revealed no significant differences due to school or sex of child on any measure,

nor any significant interactions. Data were pooled across these variables. There also were no significant between-condition differences on any pretest measure or on the number of passages completed during training. Inspection of Table 1 reveals that children who verbalized strategies during training made greater gains in self-efficacy and skill, and attributed more importance to ability as a cause of their training performance, compared with children who did not verbalize strategies. These benefits of strategy verbalization were obtained across both grades.

Insert Table 1 about here

Self-Efficacy/Skill

Posttest self-efficacy and reading comprehension skill were analyzed with a 2 (Strategy Verbalization: yes-no) x 2 (Grade: fourth-fifth) multivariate analysis of covariance using pretest self-efficacy and skill as covariates. This analysis yielded a significant effect due to strategy verbalization, Wilks' $\Lambda = .290$, $F(2, 41) = 50.27$, $p < .001$. Planned multivariate orthogonal contrasts revealed that the two strategy verbalization conditions outperformed the other two conditions, $\Lambda = .458$, $F(2, 41) = 24.24$, $p < .001$. The two strategy verbalization conditions did not differ, nor did the other two conditions. Univariate F tests revealed a significant strategy verbalization effect on both posttest measures: self-efficacy, $F(1, 43) = 63.18$, $p < .001$; skill, $F(1, 43) = 63.31$, $p < .001$. Subjects who had verbalized strategies demonstrated higher self-efficacy and reading comprehension performance.

Attributions

The four attributions were analyzed with a 2 x 2 multiple analysis of variance. A significant effect was obtained due to strategy verbalization, $\Lambda = .532$, $F(4, 41) = 9.00$, $p < .001$. Multivariate orthogonal contrasts demonstrated that the two strategy verbalization conditions differed significantly from the other two conditions, $\Lambda = .668$, $F(4, 41) = 5.09$, $p < .01$; however, neither the strategy verbalization nor the no strategy verbalization treatments differed by grade. Univariate F tests revealed a significant effect due to strategy verbalization only on ability attributions, $F(1, 44) = 22.21$, $p < .001$. Subjects who had verbalized strategies placed greater emphasis on ability as a cause of task success.

Correlational Analyses

Product-moment correlations were computed among the four attributions and posttest self-efficacy and skill to explore the theoretical relationships between variables. Correlations initially were computed separately for each experimental condition. Because there were no significant between-condition differences in correlations of any measures, correlations were averaged across conditions using an r to z transformation.

The more emphasis that children placed on ability as a cause of task success, the higher was their self-efficacy, $r(46) = .60$, $p < .01$. Ability attributions also were associated with higher skill, $r(46) = .65$, $p < .01$. A positive relationship between self efficacy and skill was obtained, $r(46) = .67$, $p < .01$.

Discussion

The present study demonstrates that verbalizing reading comprehension strategies promotes self-efficacy and ability attributions. One explanation for these benefits is as follows. Children initially observed an adult model verbalize and then successfully apply strategies. Modeling can raise observers' self-efficacy because it conveys that they are capable of succeeding if they follow the same steps (Bandura, 1982b). Being instructed to verbalize strategies prior to applying them may have created in children a sense of personal control over outcomes, which should raise self-efficacy and promote internal attributions for success (Bandura, 1982a). These low achievers may have required a close match between the model's actions and what they were asked to do to believe that they could succeed (Schunk, 1982). This initial sense of efficacy likely was substantiated as they successfully applied the strategies. The other treatment, in which children only verbalized applications, was not as closely matched to the model's actions.

This study also shows that strategy verbalization can enhance reading comprehension performance. Strategy verbalization should help focus and maintain children's attention on important task aspects (Schunk, 1982). Part of the reason why the present subjects lacked comprehension skills may have been because they often failed to distinguish important components from irrelevant features. Because verbalization is a form of rehearsal, it can promote strategy encoding and retention and thereby facilitate subsequent utilization (Denney, 1975).

As Myers and Paris (1978) have shown, young children often are

unaware of the behaviors necessary for proficient reading. They may not realize that different strategies are required depending on the type of task. Becoming proficient in a reading skill requires focusing on aspects central to its purpose and ignoring features irrelevant to that task. Strategy verbalization may enhance such focusing. When children do not verbalize strategies they may not learn them as well and may be more likely to attend to irrelevant aspects.

It should be reiterated that strategy verbalization seems most effective for children whose typical cognitive performances are deficient (Denney & Turner, 1979). They may not organize or rehearse information, focus on important features, or employ useful task strategies. Their achievement may suffer further from capability self-doubts (Schunk, 1982). Children who typically monitor their performances should acquire cognitive skills more readily and may not benefit from verbalization (Denney, 1975).

That strategy verbalization did not affect outcomes differently by grade shows that subjects were cognitively capable of handling its demands without being distracted from the comprehension activity. The possibility of distraction should have been minimal, because the strategies were tightly linked to subsequent actions. Specific verbal guidance on what to do may be especially important for children with cognitive deficiencies.

Contrary to prediction, strategy verbalization did not promote effort attributions. This finding may not be too surprising, because attributions reflected successful effort. High effort as a cause of success is valued by students (Frieze, 1980), especially when paired

with the perception of high ability (Harari & Covington, 1981). Young children often believe that high effort can enhance ability, although with development there is a progressive devaluation of effort (Harari & Covington, 1981).

Consistent with previous research, this study shows that, although self-efficacy is influenced by prior performances, it is not a mere reflection of them (Schunk, 1984). Experimental conditions did not differ in the number of passages completed during training, but strategy verbalization children subsequently judged self-efficacy higher. Efficacy appraisal is an inferential process that involves weighting the relative contributions of many factors, such as perceived ability, effort expended, task difficulty, amount of external aid received, situational circumstances under which the performance occurred, and temporal pattern of successes and failures (Bandura, 1982b).

The present study also demonstrates that capability self-perceptions bear an important relationship to subsequent achievement (Covington & Omelich, 1979; Schunk, 1984). Personal expectations for success are viewed as important influences on behavior by a variety of theoretical approaches (Bandura, 1982b; Covington & Omelich, 1979; Schunk, 1984; Weiner, 1979).

This study has applied implications. Children with reading comprehension deficiencies showed improvements in achievement outcomes from verbalizing strategies prior to applying them. Strategy verbalization easily can be incorporated into small-group remedial instruction and can be tailored to different skills. For example, teachers could train students to identify important sequences of information in stories and

to regulate their behaviors according to factors such as story length and passage difficulty (Myers & Paris, 1978; Yussen, Mathews, Buss, & Kane, 1980):

The present instructional context also seems well suited for delivering attributional feedback to children. Feedback linking children's successes to ability (e.g., "You're good at this") or effort ("You've been working hard") promotes self-efficacy and subsequent performance (Schunk, 1984). Attributional feedback could be combined with performance feedback and may enhance the benefits of instructional procedures on children's skills and self-efficacy for applying them.

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Table 1

Means (and Standard Deviations) by Experimental Condition

Measure	Phase	Strategy Verbalization		No Strategy Verbalization	
		Grade 4	Grade 5	Grade 4	Grade 5
Self Efficacy ^a	Pretest	59.3 (19.5)	62.8 (20.9)	53.6 (18.3)	57.2 (19.7)
	Posttest	87.3 (7.7)	88.9 (7.5)	61.1 (12.7)	62.1 (16.5)
Skill ^b	Pretest	10.5 (3.1)	11.9 (3.9)	9.5 (4.3)	11.2 (3.4)
	Posttest	19.8 (2.6)	20.3 (2.7)	12.5 (3.3)	13.3 (3.7)
Ability ^c	--	82.5 (16.6)	84.2 (14.4)	59.2 (17.8)	60.0 (20.4)
Effort ^c	--	76.7 (14.4)	75.8 (27.1)	87.5 (14.8)	88.3 (12.7)
Task ^c	--	60.8 (18.3)	62.5 (22.6)	54.2 (23.1)	64.2 (22.3)
Luck ^c	--	58.3 (17.0)	55.0 (26.1)	55.2 (21.5)	47.5 (22.2)

Note. N = 48; ns = 12.

^aAverage judgment per question; range of scale: 10 (low) - 100.

^bNumber of correct answers on 24 questions.

^cRange of scale: 0 (low) - 100.