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ABSTRACT

A total of 42 language-deficient second- through fourth-grade children participated in an experiment investigating the effects on children's skills and self-efficacy of strategy self-verbalization during listening comprehension instruction. An equal number of boys and girls who had been placed in remedial classes received didactic instruction in listening comprehension. Half of the children in each grade verbalized explicit listening comprehension strategies prior to applying them to questions. Methodology included pretesting (using self-efficacy judgments and a listening comprehension skill test), the training procedure (using strategy self-verbalization and no strategy self-verbalization), posttesting, follow-up training, and follow-up testing. Results showed that self-verbalization led to a higher level of self-efficacy across grades. Strategy verbalization promoted performance among third and fourth graders but did not benefit second graders. The results also suggested further exploration of strategy verbalization, as well as covert fading procedures, with young children. The experiment was seen as having implications for clarifying the role of strategy self-verbalization in promoting cognitive skills and for encouraging self-efficacy among children with language deficiencies. (References and a table of means and standard deviations by experimental condition are included). (BJD)

Strategy Verbalization Effects on Self-Efficacy and Listening Comprehension

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Abstract

This experiment investigated the effects of strategy self-verbalization during listening comprehension instruction on children's skills and self-efficacy. Language-deficient children in grades 2 to 4 received didactic instruction in listening comprehension. Half of the children in each grade verbalized explicit listening comprehension strategies prior to applying them to questions. Results showed that strategy self-verbalization led to a higher level of self-efficacy across grades. Strategy verbalization promoted performance among third and fourth graders but did not benefit second graders. Results suggest exploring further the effects of strategy verbalization, as well as covert fading procedures, with young children.

Strategy Verbalization Effects on Self-Efficacy and Listening Comprehension

Much research investigating the effects of overt self-verbalization on children's task performance shows that performance is facilitated when children verbalize strategies to be followed, other types of performance aids, or material to be recalled (Asarnow & Meichenbaum, 1979; Coates & Hartup, 1969; Jackson & Calhoun, 1982; Keeney, Cannizzo, & Flavell, 1967; Meichenbaum & Goodman, 1971; Schunk, 1982b; Taylor, Josberger, & Whitely, 1973; Whitely & Taylor, 1973). Conversely, no benefits of overt verbalization also have been obtained (Coates & Hartup, 1969; Denney, 1975; Denney & Turner, 1979).

Drawing a conclusion is somewhat problematic because these studies differed in many important ways: age and type of subjects, type of verbalization, experimental tasks, training procedures. One suggestion is that self-verbalization may be most benefical for children who typically perform in a deficient manner (Denney & Turner, 1979). For example, Keeney et al. (1967) presented a serial recall task to 6- and 7-year-old children and identified those who failed to rehearse prior to recall. After these children were trained to rehearse overtly, their recall equaled that of the spontaneous rehearsers. Meichenbaum and Goodman (1971) worked with impulsive children on the Matching Familiar Figures test (Kagan, 1966). Some children received cognitive modeling of performance strategies, whereas others were administered cognitive modeling plus self-verbalization. The addition of self-verbalization decreased errors and increased response latencies. Asarnow and Meichenbaum (1979) identified kindergartners who did not rehearse spontaneously on a serial recall task. Some children received rehearsal training similar to that of Keeney et al. (1967), whereas others received self-

instructional training that comprised cognitive modeling and self-verbalization. Although both treatments promoted posttest recall, the self-instructional training led to greater benefits on a follow-up test. A series of studies in which educable mentally retarded children were trained to generate elaborations between word associate pairs showed that verbalization of elaborations facilitated recall of associates (Taylor et al., 1973; Whitely & Taylor, 1973). Coates and Hartup (1969) found that 4-year olds who verbalized the actions of a model as they were performed subsequently reproduced them better than did children who only had observed the model. Working with preschoolers, Jackson and Calhoun (1982) found that overt self-verbalizations of block design strategies facilitated subsequent performance more than did training consisting of instructions verbally supplied by the experimenter. Schunk (1982b) obtained evidence with low arithmetic achievers that self-constructed overt verbalizations during problem solving enhanced performance more than not verbalizing.

These subjects ordinarily may not employ suggested performance strategies or rehearse material prior to recall. For example, many young children spontaneously may not produce verbal mediators that would regulate their performance, whereas most older children do (Flavell, Beach, & Chinsky, 1966). Impulsive children may not attend properly to or rehearse material to be learned or employ suggested performance strategies. The typically poor performances of low achievers also may be due in part to these factors. Retarded children possess cognitive deficiencies that interfere with their task-relevant behaviors. For these types of children, overt self-verbalization of performance strategies or other task material may help to reduce deficiencies.

Self-verbalization may not facilitate performance when children adequately can handle the cognitive demands of the task. Because self-verbalization constitutes an additional task, it even might hinder performance if it distracted children from the task at hand. Denney (1975) modeled performance strategies for 6-, 8-, and 10-year-old normal children on a 20-questions task. Older children who verbalized strategies while they performed scored no better than children who did not verbalize, and verbalization interfered with the performance of 6-year olds. The verbalizations, which consisted of specific strategies, apparently proved too distracting for the youngest children. In another study with normal children ranging from 3 to 10 years, strategy modeling plus self-verbalization yielded no benefits on different cognitive tasks compared with strategy modeling alone (Denney & Turner, 1979). Coates and Hartup (1969) also included 7-year olds and found that verbalization of the model's actions did not improve subsequent reproduction compared with passive observation.

The present study investigated the effects of overt self-verbalization of listening comprehension strategies by language-deficient children in grades 2 to 4. Overt self-verbalization was expected to facilitate children's skills more than not verbalizing strategies. It seemed likely that the low language achievement of the present sample stemmed in part from factors such as inadequate attention during instruction and failure to generate verbal mediators that would help guide language performance. Having to verbalize explicit strategies forces children to attend to them and is a form of self-rehearsal, which should promote strategy encoding and subsequent availability when children engage in comprehension activities (Denney, 1975). Overt self-rehearsal of information to be remembered has been found to facilitate subsequent performance (Asarnow & Meichenbaum, 1979; Coates & Hartup, 1969; Jackson & Calhoun, 1982; Keeney et al., 1967).

No hypothesis was advanced on whether strategy self-verbalization would prove differentially effective among the three grade levels. Such a difference would depend upon whether self-verbalization proved distracting, such as among the youngest subjects. There was no prior evidence on the present type of subjects and experimental task.

This study also explored the effects of overt self-verbalization on children's perceived self-efficacy. Bandura's theory of self-efficacy states that different treatments change behavior in part through the common mechanism of creating and strengthening perceived self-efficacy (Bandura, 1977, 1981, 1982b). Self-efficacy refers to personal judgments of one's capability to organize and implement behaviors in specific situations that may contain novel, unpredictable, or possibly stressful elements. Self-efficacy can affect choice of activities, effort expenditure, and persistence in the face of difficulties. Efficacy information is conveyed through actual performances, socially comparative vicarious means, verbal persuasion, and physiological indices.

Self-verbalization of listening comprehension strategies was expected to promote self-efficacy more than not verbalizing strategies. In the present study, children initially observed a teacher verbalize comprehension strategies, after which they applied these strategies to questions. Telling children to verbalize the same strategies represents a close match to the modeled behavior and implicitly conveys that they can succeed if they do so. Such a close match should create a sense of personal control, which is hypothesized to promote self-efficacy (Bandura, 1982a). This initial sense of efficacy is validated as children apply strategies and experience success. Schunk (1982b) compared different forms of self-verbalization; the form that represented the closest match to that utilized by the model yielded the

greatest increases in self-efficacy. No hypothesis was advanced on whether self-verbalization would promote self-efficacy equally well across grades because there was no theoretical or research evidence on this point.

Method

Subjects

The subjects were 42 children in grades 2 to 4 (ns = 14) drawn from seven schools within one school district. An equal number of boys and girls were included. Children had been placed in remedial classes by the school district based on standardized reading achievement test scores in the lowest 25% of the district population. Although different socioeconomic backgrounds were represented, children predominantly were lower-middle class.

Pretest

Children were administered the pretest in small groups of 3-4 by their remedial teachers, all of whom were women. Children sat around a large table such that they could not observe other children's work. Initially, teachers told children that although this work would not count toward their grade they should mark their answers privately and not communicate with others.

Self-efficacy judgments. Children's perceived self-efficacy for successfully answering listening comprehension questions was measured following procedures developed earlier (Bandura & Schunk, 1981; Schunk, 1981, 1982a). The efficacy scale ranged from 10 to 100 in 10-unit intervals from high uncertainty (10), through intermediate values (50-60), to complete certitude (100). Initially, children were given practice with the efficacy assessment by judging their certainty of being able to jump progressively longer distances ranging from a few inches to several yards. In this concrete fashion, children learned how to use the numerical scale values to convey the strength of their perceived efficacy.

Following this practice, children were shown a page of listening comprehension questions adapted from the SRA Achievement Series (Naslund, Thorpe, & Lefever, 1978). This page consisted of several rows of pictorial stimuli; each row included four pictures. The teacher stated, "Sometimes we work on papers that look like this where I read a story that asks a question and then you have to pick the right picture. How sure are you that you can get the right answers to questions like these?" Children were advised to be honest and to circle the number that matched how they really felt.

Listening comprehension skill test. Immediately following the efficacy assessment, children were administered the skill test, which consisted of 18 items drawn from the SRA Achievement Series (Naslund et al., 1978). The second graders received Level B, whereas the third and fourth graders received Level C. For each item, teachers read a short passage aloud while children listened. Teachers then read the question and instructed children to mark their answers. Children were allowed about 15 secs per answer. No performance feedback was given. The measure of skill was the number of questions that children answered correctly.

Training Procedure

Following pretesting, children were assigned randomly within grade and school to one of two experimental conditions: strategy self-verbalization or no strategy verbalization. All children participated in the training program for two, 30-minute sessions per week over four consecutive weeks. During the other class periods each week, children worked with their teachers on other topics, such as vocabulary and reading comprehension. Materials used during the training sessions were standardized across teachers.

Strategy self-verbalization. Children met with their teachers in small groups (3-4 students) and were given pages containing rows of pictorial stimuli; each row included 3-5 pictures. The teacher directed children's

attention to the appropriate row and read a story; for example, "Father told the family, 'When you use the toothpaste, squeeze the tube at the bottom!'" The teacher then verbalized aloud the following strategies and instructed children to repeat aloud each strategy after she finished saying it.

(1) What is it I have to do? (2) I must find the correct picture. (3) How will I do it? (4) I'll look at each picture carefully to see if it matches the story I heard. (5) When I find the answer I'll mark it. Thus, the teacher verbalized strategy (1) and prompted children to say it aloud. Once they finished, she verbalized strategy (2), and so on. After children verbalized strategy (5), the teacher directed their attention to the first picture in the row and asked if that were the correct one. This didactic sequence was continued until the correct picture was reached, at which point these procedures were applied to a new story. Several stories were completed during each session. Teachers insured that all children verbalized the strategies and answered the questions by prompting as needed. If children seemed confused, teachers reread the story but did not supply the answer.

No strategy self-verbalization. The training procedures for children assigned to this condition were identical to those of the strategy self-verbalization condition except that children did not repeat strategies 1-5 after the teacher verbalized them. Instead, the teacher verbalized the strategies and then proceeded with the didactic sequence, during which children answered the questions aloud.

The training procedures for both conditions were scripted to insure that they were implemented in standardized fashion across teachers. Observations of teachers on selected occasions revealed that except for some small idiosyncratic differences in style, teachers followed the scripts.

Posttest

A posttest was administered at the end of the fourth week of training. It consisted of an efficacy assessment similar to the pretest, and a parallel form of the listening comprehension portion of the SRA Achievement Series. Children were not allowed to verbalize.

Follow-up Training

The training sessions were continued for an additional four weeks with two, 30-minute sessions per week, to determine the effects of additional training. Self-verbalization children continued with the same procedures; however, no-verbalization children now verbalized strategies and followed the same procedures as strategy-verbalization subjects.

Follow-up Test

At the end of the eighth week, all children were administered a follow-up test, which consisted of the efficacy assessment and the SRA listening comprehension test. The materials and procedures were similar to those of the pretest. Children were not allowed to verbalize. All tests were scored by an adult who was unfamiliar with children's experimental assignments.

Results

There were no significant differences due to teacher, school, or sex of child on any pre-, post-, or follow-up test measure, nor were there any significant interactions. The data therefore were pooled for subsequent analyses. There also were no significant differences between grade levels or verbalization conditions, nor any significant interactions, on any pretest measure or on the number of questions answered during training. Pre-, post-, and follow-up test means and standard deviations are shown by experimental condition in Table 1. Analysis of covariance procedures were applied to each posttest and follow-up test measure using the corresponding pretest measure as

the covariate according to a 3 (Grade: 2nd-3rd-4th) x 2 (Strategy Verbalization: yes-no) factorial design.

Insert Table 1 about here

The use of analysis of covariance necessitated demonstration of slope homogeneity across experimental conditions (Kerlinger & Pedhazur, 1973). Tests of slope differences for each measure were made by comparing a linear model that allowed separate slopes for each of the experimental conditions against one that had only one slope parameter for estimating the changes across the conditions. For each measure, the increment in the proportion of variance accounted for by using separate slopes, as compared with a common slope, was small, and the associated F ratios were nonsignificant.

Analysis of covariance of the posttest efficacy measure yielded a significant main effect for Strategy Verbalization, $F(1, 35) = 5.12$, $p < .05$; however, the main effect for Grade and the Grade x Strategy Verbalization interaction were nonsignificant. Post-hoc analyses using the Newman-Keuls multiple comparison test (Kirk, 1968) showed that within each grade level strategy-verbalization children judged themselves significantly ($p < .05$) more efficacious than did children who did not verbalize strategies: Analysis of the follow-up efficacy measure yielded nonsignificant results.

On the posttest measure of listening comprehension, ANCOVA yielded a significant main effect for Strategy Verbalization, $F(1, 35) = 4.18$, $p < .05$, as well as a significant Grade x Strategy Verbalization interaction, $F(2, 35) = 4.07$, $p < .05$. Post-hoc comparisons showed that fourth-grade strategy-verbalization children significantly ($p < .05$) outperformed the fourth graders who did not verbalize strategies. This same result was obtained among the

third graders ($p < .05$); however, this comparison among second graders was not significant. Analysis of the follow-up listening comprehension measure yielded no significant results.

Discussion

The present experiment clarifies the role of strategy self-verbalization in promoting cognitive skills and self-efficacy among children with language deficiencies. Children who verbalized listening comprehension strategies developed a higher level of self-efficacy compared with children who did not verbalize strategies. Strategy verbalization also enhanced older children's listening comprehension skills but did not promote performance among second graders. When the third and fourth graders who had not verbalized strategies were given strategy verbalization training, their performance matched that of children who had verbalized strategies previously.

An explanation for the benefits of strategy verbalization on self-efficacy is as follows. Pairing strategy verbalization with successful performance may have created a strong sense of personal control among children, which is hypothesized to promote self-efficacy (Bandura, 1982a). These children observed their teachers verbalize strategies and were instructed to verbalize strategies themselves. Such instructions may have conveyed that if children followed this sequence they would be successful. Perhaps the present sample of children, given their language deficiencies and prior failures, required a very close match between their teachers' actions and what they were asked to do to perceive that they could attain success. The other treatment, in which children did not verbalize strategies, did not provide as close a match to the teachers' actions.

In contrast to the findings for self-efficacy, strategy self-verbalization promoted skillful performance only among older children. Verbalizing

strategies should help children focus and maintain their attention on the task (Schunk, 1982b). Part of the reason why the present sample possessed listening comprehension deficiencies might be because they often paid inadequate attention during instruction. Focused attention on strategies should promote their encoding and retention, and thereby lead to greater subsequent availability (Denney, 1975).

Given the results for older children, it seems that strategy self-verbalization interfered somewhat with the performance of second graders. It is possible that this additional task proved too confusing; that is, having to verbalize strategies may have distracted these children from the task at hand, which would have affected strategy encoding, retention, and availability during the testing situations. Denney (1975) also found that strategy verbalization interfered with the performance of young children.

It is possible that the second graders would have benefited had the verbalizations been faded to a covert level during training. Children might have been confused when they were not allowed to verbalize during the tests. Although some studies have shown that once strategies are instilled overt verbalization may be discontinued with no performance decrement (Meichenbaum & Goodman, 1971; Whitely & Taylor, 1973), other research has demonstrated that overt-to-covert fading is less effective than overt verbalization alone (Jackson & Calhoun, 1982). Future research might explore in greater depth the effectiveness of fading procedures with young children.

It must be reiterated that self-verbalization is probably most effective with children whose typical cognitive performances are somehow deficient (Denney & Turner, 1979). Such children may not organize, rehearse, or otherwise properly attend to strategies necessary for successful performance. Their achievement may suffer further from self-doubts concerning their capabilities. Children who typically monitor their performances may grasp

cognitive operations more readily and may not benefit much from self-verbalization (Schunk, 1982b).

The present study has teaching implications. Children whose past listening comprehension performances were deficient showed improvements in achievement outcomes over a short period from verbalizing comprehension strategies. Such strategy verbalization, which was incorporated into children's regular didactic instruction, can be implemented easily by remedial teachers. At the same time, the present study shows that the addition of strategy verbalization led to no performance benefits among younger children. Future research should investigate the effects of strategy verbalization on other language competencies and whether these effects vary according to children's developmental status.

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Table 1

Means (and Standard Deviations) by Experimental Condition

Measure	Phase	Grade 2		Grade 3		Grade 4	
		Strategy Verbalization	No Strategy Verbalization	Strategy Verbalization	No Strategy Verbalization	Strategy Verbalization	No Strategy Verbalization
Self-Efficacy[a]	Pretest	58.1 (23.7)	54.0 (20.3)	57.5 (20.6)	56.0 (21.8)	53.3 (16.6)	58.6 (23.8)
	Posttest	88.3 (12.6)	65.9 (13.5)	82.5 (15.0)	60.0 (11.6)	80.0 (11.8)	60.1 (12.7)
	Follow-up	84.0 (15.0)	86.0 (23.7)	84.3 (23.7)	75.0 (15.4)	81.3 (10.9)	75.0 (19.5)
Listening Comprehension[b]	Pretest	69.3 (18.9)	66.3 (15.5)	66.0 (14.7)	58.8 (14.9)	71.3 (13.6)	65.8 (14.6)
	Posttest	78.2 (12.9)	83.3 (21.0)	89.4 (7.3)	75.0 (6.7)	92.2 (9.5)	81.3 (8.6)
	Follow-up	72.4 (12.2)	76.9 (8.4)	84.0 (13.9)	83.3 (5.4)	84.4 (12.7)	79.7 (14.4)

Note. N = 42; ns per grade = 14.

[a]Range of scale: 10 (low) - 100.

[b]Percentage of correct answers.