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AUTHOR Hannafin, Michael J.
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ABSTRACT

Two studies designed to establish classification procedures and the reliability of a learning strategy screening procedure were conducted, using 184 third and 173 fourth graders from a middle-class suburban school district as subjects. A 10-minute learning strategy screening was administered during which subjects reported which of six generic strategies--three verbal and three visual--were used to remember presented words. In the first study, the results indicated that roughly the same proportion of third and fourth graders reported visually dominated or verbally dominated learning strategies to remember presented words. Strategies could be readily classified as verbal or visual, or visual, verbal, and mixed, using the screening results. The results of the second study indicated that strategy classifications were differentially reliable, depending upon the number of classifications used, being most reliable when using a bi-classification system. This report includes 15 references (Author/LMM)

Research in Progress II: Preliminary Data From a Group-Admininstered Procedure to Identify the Spontaneous Learning Strategies of Children

Michael J. Hannafin

University of Colorado

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Abstract

Two studies, designed to establish classification procedures and the reliability of a learning strategy screening procedure, were conducted. The subjects for both studies were third-and fourth-graders from a middle-class suburban school district. The subjects were administered a 10-minute learning strategy screening, during which they reported which of six generic strategies, three verbal and three visual, were used to remember presented words. In Study 1, the results indicated that roughly the same proportion of third and fourth graders reported visually dominated as verbally dominated learning strategies to remember presented words. Strategies could be readily classified as VERBAL or VISUAL, or VISUAL, VERBAL and MIXED using the results of the screening. The results of Study 2 indicated that strategy classifications were differentially reliable, depending upon the number of classifications used, being most reliable using a bi-classification system. Practical considerations for employing bi-versus tri-classification schemes are discussed.

Research in Progress II: Preliminary Data From a Group-Admininstered Procedure to Identify the Spontaneous Learning Strategies Used by Children

The construct of learning strategy is one that has vastly greater intuitive than empirical validity. Although educators, such as those in special education, largely assume the existence of personal learning strategies and plan instructional activities based upon such strategies, research regarding individual learning strategies is rare and equivocal.

Recently, studies have been conducted in an attempt to identify the methods reported by children to remember presented information. The procedures used to identify students' learning strategies by Filan (1981) study have compelling logic. Students were interviewed individually to determine the strategies by which presented pictures and words were presumably recalled. While the logic of such a procedure may be compelling, the practicality is not. Filan's procedure required a substantial amount of both experimenter and learner time. Procedures that required less time to administer, but retained the accuracy and intuitive appeal of Filan's procedure, are likely to be more practical and accepted.

Hannafin and Carey (Note 1) attempted a group-administered version of Filan's procedure, during which students individually wrote their responses describing how presented words were remembered. While this procedure was more practical, a large portion of their student report data was unusuable due to the confounding effects of the requirement for written responses.

An analysis of the responses provided by students from both the Filan (1981) and Hannafin and Carey (Note 1) studies, however, revealed

that students consistently reported similar types of strategies to describe verbal and visual memory strategies--referred to as "generic" responses (Hannafin, 1981). Furthermore, type of strategy, verbal or visual, was found to be independent from systematic sex, ability, and achievement influences (Hannafin, Note 2). In effect, recent studies suggest that a learning strategy screening procedure, one that is group-administered and permits students to select from among empirically derived generic strategy options, may be a reasonable and relatively simple method to identify the individual learning strategies used by children.

The purposes of the present study were to develop and apply a group-administered learning strategy screening using the generic strategy options, and to determine the reliability of the scores obtained via the procedure and the reliability of the classification of individual learning strategies.

STUDY 1

Method

Subjects

A total of 184 third-grade and 173 fourth-grade students served as subjects. Students were selected from either of two schools located in a predominately middle-class suburban school district.

Materials

The materials used in the study included a group-administered learning strategy screening. An audiotape learning strategy screening, consisting of directions for completing the screening, two practice words, and the presentation of five concrete nouns, was employed. The screening,

which was used to determine the reported visual or verbal learning strategies used by students to remember the presented nouns, was approximately 10 minutes in duration and was presented and paced via audiotape. The nouns used during the learning strategy screening were boy, animal, book, plant, and tree. The concreteness of the five nouns was based upon the ratings provided by Paivio, Yuille, and Madigan (1968). The criteria used for word selection included: (a) high frequency (AA) based on the Thorndike-Lorge (Thorndike & Lorge, 1944) fequency index, (b) high concreteness ratings, and (c) high imagery rating.

Students recorded individually their response to the learning strategy screening on a student strategy sheet. The strategy sheet provided space for writing the word presented and for selecting which of seven strategy options the student used to remember the word. The options, which were identified as generic responses by Hannafin and Carey (Note 1) and Filan (1981), included three visual and three verbal response options. The positions of the verbal and visual options were systematically rotated to minimize possible response set tendencies. In addition, one open-ended option for "other" strategy was available for each item. The "other" strategy response, when used, was subsequently classified by the researcher as either a visual or verbal strategy.

Procedures

Students were administered the learning strategy screening in their home classrooms. During the screening, students were directed to remember the presented word for five seconds. Students were then told to write the presented word on their student strategy sheets and to select the response option which best described how the word was remembered. The

experimenters circulated throughout the room to assist students, when needed, in completing the tasks.

Upon completion of the learning strategy screening, students were classified into learning strategy groups according to the strategies they reported using during the screening. Student responses were tabulated in the following manner. Each verbal option selected was assigned a weight of -1, and each visual option selected was assigned a weight of +1. Student responses were summed for the five screening items, with possible scores ranging from -5 through +5.

Results and Discussion

The distribution of students obtained for the overall sample, shown in Table 1, was significantly different from a random distribution as determined by the Kolmogorov-Smirnoff test of distribution equality, $p. < .01$ (even numbered scores were deleted from the analysis).

No differences were obtained between the frequency distribution of third-versus-fourth graders. This finding suggested that no extreme shifts in reported strategies occur from one grade to the next. It was also observed that roughly equal proportions of third and fourth graders reported moderately to high use of verbal (-2 through -5), visual (+2 through +5) and no clear dominance of visual or verbal strategies (-1 through +1).

Classifications for personal learning strategy were made using the scores computed from the screening. Two classification options were developed: 1) bi-classification scheme, using VERBAL dominance (-5 through -1) and VISUAL dominance (+1 through +5) with mid-range scores discarded. The minimum percentage of responses needed to classify as a

Table 1

Learning Strategy Screening Score Frequencies
by Grade

	Learning Strategy Screening Scores											
Grade	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	Total
3rd	23	2	17	5	37	11	33	4	30	2	20	184
4th	23	0	19	1	25	6	30	6	30	3	30	173
Total	46	2	36	6	62	17	63	10	60	5	50	357

Classification Options:

1) Bi-classification: Verbal (-5 through -1) n = 152
Visual (+1 through +5) n = 188
Minimum Percent Dominance (Visual or Verbal) = 60%

2) Tri-classification: Verbal (-5 through -2) n = 90
Mixed (-1 through +1) n = 142
Visual (+2 through +5) n = 125
Minimum Percent Dominance (Visual or Verbal) = 75%

visual or verbal dominance was 60%. Under the other option, a tri-classification scheme, students with scores from -2 through -5 were classified as VERBAL, +2 through +5 were classified as VISUAL, and -1 through +1 were classified as MIXED personal learning strategy groups. The classification scheme required that respondents report a minimum of 75% verbal or visual responses to be classified accordingly.

The results of Study 1 indicated that the group-administered, structured learning strategy screening provided a easy-to-use procedure to identify the relative visual-verbal learning strategy dominance reported by students. The results further suggested that learning strategy classifications may be made using relatively clear-cut and objective student response patterns, and that strategy use appears to be distributed fairly equally across the target population.

STUDY 2

Method

Subjects and Procedures

A total of 170 third-and-fourth graders, balanced across grades, were administered the same screening procedure in the same manner described in Study 1. The screening procedure was re-administered one week later. The purpose of Study 2 was to evaluate the reliability of the learning strategy classifications under the two possible classification options.

Results and Discussion

The results of Study 2 are summarized in Tables 2 and 3. As shown, the percent of students reliably classified was greatest for the bi-classification scheme. This was expected, since a greater number of

Table 2

Classification Reliability Using
Bi-Classification Options

Rescreening	Initial Screening VERBAL (-5 to -1)	Initial Screening VISUAL (+1 to +5)	Totals
VERBAL (-5 to -1)	78	16	94
VISUAL (+1 to +5)	14	60	74
Totals	92	76	168[a]

Note. 82% of students retained classifications

[a]2 students obtained screening scores of "0" on either screening

Table 3

Classification Reliability Using
Tri-Classification Options

Rescreening	Initial Screening VERBAL (-5 to -2)	MIXED (-1 to +1)	VISUAL (+2 to +5)	Totals
VERBAL (-5 to -2)	49	14	4	67
MIXED (-1 to +1)	8	30	8	50
VISUAL (+2 to +5)	4	10	43	53
Totals	61	54	55	170

Note. 75% of students retained classifications using 3 classifications; 79% retained VERBAL or VISUAL classification.

borderline or marginal classifications points were created using a tri-classification. Furthermore, the bi-classification option resulted in the discarding of all "0" scores, creating greater distance between classification crossovers. However, the practical implications of the tri-classification scheme appear to outweight the apparent benefits of a more reliable procedure. If type of learning strategy is to be considered a legitimate instructional design variable, then it will likely be most potent when the influence of the strategy is strongest (at either the highly verbal or highly visual ends of the classification scheme). In other words, although a simple two-part strategy classification scheme may be more reliable than a three-part scheme, the strength of the strategies at the ends of the strategy continuum is likely to exert more of a controlling influence as an instructional design variable and provide greater certainty of interaction between learner strategy and instructional modality.

General Discussion

The identification of the individual learning strategies used by students via a group administered screening procedure has a variety of potential uses. From a research standpoint, relatively large samples of prospective subjects can be screened easily, and prior experimental selection or assignments can be made based on known learning characteristics. It may also be possible to study empirically the effects of modality training on subsequent use of the instructed modality in problem solving or memory use. From an applied perspective, knowledge of learner strategies could affect decisions regarding instructional design, presentation, and the use of adjunct or supplementary instructional materials.

Earlier investigation of learning strategy, however, has dampened the optimism of present researchers. Previous studies of the effects of learning strategies on learning from consonant vs. disconsonant modality instruction have produced inconsistent, and often inconclusive, results. It is unclear precisely how many of the discrepancies in reported research are related to methodological problems and abnormalities versus problems inherent in the pursuit of the construct itself. It is the author's belief that, although the learning strategy construct is likely to present a myriad of problems for researchers, further study is warranted if only from an epistimological perspective. Knowledge of how people remember, even of how people think information has been remembered, can only further our understanding of the human factors involved in learning.

The present study has advanced knowledge of individual learning strategies. However, further study is still needed--with regard to the procedures described in this paper and to the study of learning strategy in general. The learning strategy screening procedures used in the present study need further development and refinement. Additional screening items are needed in order to strengthen the reliability of the classifications. In addition, further study is needed regarding the stability of learning styles across learning tasks (e.g., prose vs. word recall), type or level of desired learning (e.g., concrete vs. abstract), and developmental influences on strategy use. It is likely that future uses of learning strategies, both applied and experimental, cannot be determined accurately until such data are available.

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