Concept learning with three types of verbal labels¹

WYATT E. STEPHENS
TEXAS CHRISTIAN UNIVERSITY

Three groups of second grade children learned a concept with different types of verbal labels, while a fourth group learned the concept with no verbal label. Predictably, the Ss learned more rapidly with verbal labels than without. However, labels from different linguistic form classes produced differential learning rates. Further investigation of this finding may provide information relevant to important questions in the area of concept learning.

The facilitating effect of verbal labels on concept learning has been verified by numerous studies, but, more recently, several investigators have provided detailed information regarding this finding. Archer and Rasmussen (1961), for example, found that pretraining with verbal labels produced increments in performance on classification tasks involving geometric figures, when the attribute relevant to classification was the one for which the verbal label had been learned. Emphasizing another point, Gagne (1962) found that Ss who verbalized during practice on a conceptual task reached solutions more rapidly, showed more correct responses, and were better able to state an accurate verbal summary of the principle they had used in the classification task.

Additional information, more systematic in approach, has been provided by Spiker and his associates, who have explored several variables important in the labeling process. The investigations of Kurtz (1955), Cantor (1955), Norcross & Spiker (1957), and Spiker & Norcross (1963), have led to the conclusion that prior learning of distinctive names for stimuli in conceptual learning tasks has a facilitating effect which cannot be explained by reference to warm-up effect, learning to learn, or observing responses. Reese (1958), in a further investigation of labeling and concept learning, found that poorly learned names, whether distinctive or similar, will produce interference with learning, while well-learned names, whether distinctive or similar, will have facilitating effects on concept learning.

While existing studies of the effects of labeling on concept learning provide valuable information, a number of areas deserve additional attention. One important line of questioning for further research may be derived from the observation that human beings learn a substantial number of concepts which cannot be accurately described by noun labels. Indeed, labels from the noun form class, although predominating in early childhood, are utilized with increasingly less frequency with increases in age (McCarthy, 1943). Examination of existing literature indicates that nearly all studies of the effects of verbal labels upon conceptual learning have employed labels which are nouns.

The purpose of this study was to compare the concept learning performance of four groups of children, in which one group was provided with no verbal label, while the other three groups used verbal labels of different types. It was intended to determine whether use of noun labels, verb labels, and adjective labels produced differential effects in learning when compared with each other, and with performance on the same task with no verbal label provided.

Method

The Ss were 40 second grade children of both sexes with measured IQ scores in the 90-110 range. Equal numbers of boys and girls were randomly assigned to four experimental groups. These were the no label group (NO), the noun label group (NL), the verb label group (VL), and the adjective label group (AL).

Each individual in all of the four groups was presented with identical geometric figures. The figures for the learning task were produced by using a 1 3/4 in. square and six figures yielded by modifications of the square. Thus, the following seven figures were included: (1) square, (2) square with middle third omitted from right and left sides, (3) square with middle third omitted from top and bottom, (4) square with top omitted, (5) square with right side omitted, (6) square with bottom omitted, and (7) square with left side omitted.

The examiner's instructions to the four groups were identical except for differences necessary to convey the form class membership of the label to be used. The NO Ss were instructed to find items which had the same appearance, the NL group was told that the figures to be located were named ORK, the VL group was instructed to find the ones which were ORKING, and the AL Ss were required to locate the figures which were ORKY. Brief instructions, including the verbal label, were repeated before each of the learning task trials.

In the learning task, each S was individually presented the seven variations of the square figure in a series of seven blocks of seven trials, with each block including all seven possible variations of the basic figure in a randomized order. The S was required to learn that the figure with one side open was the appropriate response, regardless of the direction of the opening. For each S, the examiner provided knowledge of results for each response. This procedure was continued until the S successfully completed one block of seven trials with no errors.

Results and Discussion

A one-way analysis of variance revealed significant differences between groups in mean number of trials

to a criterion of one complete block of correct responses ($F=3.50, p<.05$). Paired comparisons of groups revealed that both the NL and AL groups attained criterion significantly more rapidly than the NO group ($t=4.18, t=3.90$ respectively, $p<.01$). However, the VL group's performance did not differ from that of the NO group. Both the NL group and the AL group reached criterion sooner than the VL group ($t=2.71, t=2.25$ respectively, $p<.05$), but did not differ between themselves. By the end of the fourth block of trials, all groups had attained a similar level of performance.

These results bore out the well-established finding that verbal labels facilitate concept learning. Less predictable, however, on the basis of earlier studies, was the finding that verbal labels from different linguistic form classes have differential facilitating effects on concept learning. The Ss in this study who used verbs as labels showed no increase in learning rate, but those who labeled the stimulus figures with nouns, and adjectives, showed significant increases in learning rates. This finding requires further investigation, since it raises questions which are relevant to basic considerations in the area of early conceptual development.

References

- CANTOR, G. N. The effects of three types of pretraining on discrimination learning in preschool children. *J. exp. Psychol.*, 1955, 49, 339-342.
- GAGNE, R. M., & SMITH, E. C., JR. A study of the effects of verbalization on problem solving. *J. exp. Psychol.*, 1962, 63, 12-18.
- KURTZ, K. H. Discrimination of complex stimuli: the relationship of training and test stimuli in transfer of discrimination. *J. exp. Psychol.*, 1955, 50, 283-292.
- McCARTHY, DOROTHEA. Language development in the preschool child. In R. G. Barker, J. S. Kounin, and H. F. Wright (Eds.), *Child Behavior and Development*. Pp. 107-128. New York: McGraw-Hill, 1943.
- NORCROSS, K. J., & SPIKER, C. C. The effects of type of stimulus pretraining on discrimination performance in preschool children. *Child Developm.*, 1957, 28, 79-84.
- RASMUSSEN, E. A., & ARCHER, E. J. Concept identification as a function of language pretraining and task complexity. *J. exp. Psychol.*, 1961, 61, 437-441.
- REESE, H. W. Transfer to a discrimination task as a function of amount of stimulus pretraining and similarity of stimulus names. Unpublished doctoral dissertation, State University of Iowa, 1958.
- SPIKER, C. C., & NORCROSS, K. J. The effects of previously acquired stimulus names on discrimination performance. Unpublished manuscript, State University of Iowa, 1957, cited in *Monograph of the Society for Research in Child Development*, 1963, 28 (Whole No. 86).

Note

1. This study was supported by a TCU Faculty Research Grant.