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Language patterns in conjunctive concept identification

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Subjects learned two conjunctive concepts utilizing geometric figures in which there were two relevant attributes. An initial positive instance in each problem was followed by three blank-trial stimuli which overlapped the initial instance by exactly two attribute values. The analysis of blank-trial responses indicated that Ss sample adjective-noun hypotheses significantly more often than adjective-adjective hypotheses, where adjective-noun and adjective-adjective describe labels which can be given the cue pairs.

Studies in concept identification (CI) have made extensive use of geometrical patterns and configurations to provide simple, familiar, and highly dimensionalized stimuli suited for the tasks. The verbal mediation responses for labeling the patterns, though known to exist, have not been considered as a relevant variable (Bourne, 1966). Paivio (1963) found that the rate of learning in a paired-associates task was inversely proportional to the abstractness of nouns used as stimuli. In a study by Stephens (1968) verbal labels from

different linguistic form classes were arbitrarily assigned to concepts involving geometric designs. Learning proceeded faster when concepts were given noun or adjective labels than when given verb labels or no label at all. Stephens found no significant difference between noun and adjective labels, but Paivio (1963) found faster learning rates in paired-associates when nouns were used as stimuli and adjectives as responses than when the roles were reversed.

The experiment reported here involved conjunctive concept tasks with two relevant attributes. Stimuli, geometric figures, were varied along three dimensions: shape, shading, and number of figures. In this context, conjunctive concepts utilizing two attributes can be described by two adjectives (AA), e.g., "two black (figures)," or by an adjective and a noun (AN), e.g., "black squares."

The purpose of this experiment was to investigate the effects of the above form class combinations on CI.

METHOD

The stimuli were presented on 3 x 5 cards and varied along three dimensions: (a) shape of figures—crosses, circles, or squares; (b) shading of figures—black, striped, or

Table 1
Number of Blank-Trial Stimuli Classified as Instances

Stimulus Form Class	Problem		Means
	First	Second	
AN	42	55	54.3
AN	62	58	
AA	42	38	40.0

white; and (c) number of figures—one, two, or three. The Ss were 90 undergraduate students fulfilling course requirements in introductory psychology classes. Ss were asked to learn two conjunctive concepts in succession in which two of the three stimulus attributes were relevant. Three representative concepts were used: "shaded circles," "three crosses," and "three black (figures)." The selection and presentation order of the problems were balanced and assigned on a rotating basis to Ss as they appeared. Following an initial positive instance in each problem, three blank-trial stimuli were randomly presented. Each blank-trial stimulus overlapped the initial positive instance by exactly two values. In each blank-trial sequence there were two AN labels and one AA. Thus, each S responded to four AN stimuli and two AA stimuli. Ss received no feedback during blank trials (see Levine, 1966). All Ss received identical instructional and warmup periods.

RESULTS AND DISCUSSION

The analysis was designed to test for any consistent bias in blank-trial responding. Positive responses to the blank-trial stimuli were totaled by the respective stimulus form classes. The form class totals for the two problems were tested for homogeneity using Cochran's test for repeated observations (Cochran, 1950). The test revealed a significant treatment effect ($\chi^2 = 23.5$, $df = 5$, $p < .001$). The data indicate that Ss sample AN hypotheses significantly more than AA hypotheses. Thus, at the beginning of a conjunctive CI task, Ss will be more likely to sample an AN hypothesis first. This factor should facilitate learning AN concepts and inhibit learning AA concepts. The results of this experiment indicate that verbal habits have a measurable effect on concept formation.

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