

Continued associations to homographs

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Continued associations were collected to each member of a set of homographic stimuli. The associations were scored with respect to their meaning referent (primary or secondary). In accordance with the S-R hierarchical model of word associations, there was a moderately high covariation between percentage scores based on cultural norms and percentage scores based on individual associative protocols. However, the pattern of associations suggested a modification of this model in terms of the separate retrieval of each meaning of a given homograph.

Recent research (Cramer, 1970; Kausler & Kollasch, 1970) has demonstrated that discrete associations to homographic stimuli generally occur to both meanings of a given homograph and that homographs differ widely in the proportions of Ss responding to the separate meanings. Variation in the disparity between primary and secondary meanings is undoubtedly a critical attribute to consider in the selection of homographs as task units for other areas of research.

The present study extended this earlier research by analyzing continued word associations to homographic stimuli. The continued association method has been employed successfully in testing attributes of nonhomographic stimuli (e.g., Bruder, 1968), and its present application seemed to offer a means of gaining further insights into the nature of the disparity-of-meaning attribute of homographic stimuli. In particular, the present study attempted to test the adequacy of the S-R hierarchical model to account for these associations. In this model, culturally determined associative probabilities are viewed as representing the associative probabilities of individual Ss as well (e.g., Bruder, 1968). When extended to homographic stimuli, the cultural probabilities for responses to the primary and secondary meanings, as determined by discrete association norms, are expected to estimate the probabilities of responding by a given S to these same meanings on consecutive associations. Consider the case of a homograph for which the percentages of Ss responding with primary and secondary meaning associations in the discrete norms are 67% and 33%, respectively. The model predicts that, for the individual S, 67% of his continued associations to that same homograph should be to the primary meaning and 33% to the secondary meaning. Consequently, for a representative set of homographic stimuli, there should be a high correlation between mean percentage scores

computed from individual Ss' continued associations and percentage scores.

METHOD

Subjects

The Ss were 100 students, 50 men and 50 women, in a general psychology class at St. Louis University. All of the Ss were naive with respect to prior participation in research projects on verbal processes. For the analysis reported below, they were combined into one group (N = 100) since previous research with discrete associations to homographs failed to find any pronounced sex differences in proportions responding to the different meaning referents (Kausler & Kollasch, 1970).

Stimulus Words

The word association list contained 15 homographic stimulus words selected from the Kausler-Kollasch (1970) norms and 10 nonhomographic filler words selected from the Palermo & Jenkins (1964) norms. The homographs were selected so as to be representative of the stimulus population included in the Kausler and Kollasch discrete norms. The first and second meanings were determined by the order of frequency of occurrence in the Lorge-Thorndike (1938) semantic count (cf. Kausler & Kollasch, 1970). For 13 of the 15 homographs, the primary and secondary meanings, as determined by percentage scores in the discrete norms, were also the first and second meanings in the Lorge-Thorndike count, with *jam* and *lead* being the exceptions.

Procedure

The stimulus list was presented in booklet form. For each stimulus word, there were six lines printed below it. The Ss were requested to give six associations, one per line, to each stimulus word. The instructions described the general nature of the task (without mentioning the fact that a number of the stimulus words were homographs), including an example with a nonhomographic stimulus word, and stressed that S should work as rapidly as possible, refer to the stimulus word each time an association was given, and avoid repeating an association. Two different random orders of stimulus words were employed, with 50 Ss receiving each order.

Associations that were listed in the discrete norms (Kausler & Kollasch, 1970) were scored with respect to the meaning referent assigned in those norms. For other associations, the two Es served as independent judges. Assignment of a meaning referent required agreement between the two judges.

RESULTS AND DISCUSSION

The main analysis concerned the correspondence between percentage scores based on cultural norms and percentage scores based on the associative protocols of individual Ss. Two percentage scores were computed per S for each of the 15 homographs, one for the homograph's first meaning and one for the homograph's second meaning as listed in the Lorge-Thorndike count. The possible values of each score were 100% (i.e., all six of the S's associations were in reference to the given meaning), 83%, 67%, 50%, 33%, 17%, and 0%. As noted earlier, the S-R hierarchical model predicts a high correlation between these mean percentage scores and the comparable percentage scores reported in the discrete norms. For 14 of the 15 homographs, the

primary meaning identified by individual-based scores was the one identified as such in the discrete norms. Moreover, in agreement with the S-R hierarchical model, the rank-order correlation between the two sets of percentage scores was moderately high, $.75, p < .01$ for first meanings and $.73, p < .01$ for second meanings. However, a disturbing feature in accepting this moderately high covariation between individual and cultural values as support for the hierarchical model rests in the large variances found for individual-based scores. These large variances reflected frequency distributions that were highly skewed and often bimodal. For example, for *bass* the frequencies of Ss with percentage scores of 100, 83, 67, 50, 33, 17, and 0 were 26, 15, 15, 7, 7, 6, and 24, respectively, to the first meaning and 14, 6, 10, 4, 6, 16, and 44, respectively, to the second meaning. It seems highly unlikely that these distributions come from a population having parameter values estimated by the proportions of Ss responding to the first and second meanings of *bass* in the discrete norms (.54 and .42).

The frequency data suggest a modification of the S-R hierarchical model. According to this modification, S retrieves initially one meaning of a given homograph and continues associating to that meaning until the supply of readily available associates within the hierarchy is exhausted. At this point, S may retrieve the other meaning and then begin to elicit associations within the hierarchy for this separate meaning. The percentage of Ss responding to each meaning form on a discrete association test would then measure the differential probabilities of initial retrieval of the separate meanings. As a preliminary test of this model, the present Ss were dichotomized separately on each homograph (with the exceptions of *bridge* and *wind*—there were few or no Ss responding to their secondary meanings on the first association) into primary and secondary groups. The basis for these classifications was the nature of S's first association, that is, whether it was in reference to the primary or to the secondary meaning of the homograph. Mean percentage scores for primary associations on the remaining five associations were then determined separately for the primary and secondary groups. In accordance with the modified hierarchical model, Ss in

the primary group gave a preponderance of their remaining associations to the primary meaning of each homograph. For the 13 homographs, the mean percentage scores ranged from 62.5% to 75.7%, with an overall mean of 69.1%. On the other hand, the secondary group generally gave considerably fewer associations to the primary meaning. The mean percentage scores ranged from 20.0% to 60.0%, with an overall mean of 34.0%. The difference in central tendency between the primary and the secondary group was tested for statistical significance by means of the median test (highly skewed distributions). This difference reached statistical significance for 11 of the 13 homographs ($ps < .01$). Ideally, an analysis of runs composed of consecutive associations to a given meaning would provide important data for testing other aspects of the modified hierarchical model. However, this analysis must await the development of a methodology that avoids the scoring problems created by the disruption of runs by ambiguous associations (i.e., associations that cannot be scored with reference to either meaning). The frequency of such associations increased regularly from the first (4%) to the sixth association (18%). A plausible assumption is that many ambiguous associations refer to the separate meanings in approximately the same proportions found for scorable associations, thus leaving disparity scores largely unaffected by the increase in ambiguity. However, it is possible that at least a portion of the ambiguous associations refer to some unknown meaning that is idiosyncratic in content.

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