Word frequency of synonym responses as a function of word frequency of the stimulus and list position of the response[1]

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Abstract

Fifty-seven subjects wrote synonyms to stimulus words of high, moderate and low word frequency selected from the Lorge-Thorndike lists. High stimulus words tended to elicit synonym responses of higher word frequency than did moderate and low words. In addition, mean word frequency of the responses was shown to be a decreasing function of list position of the response.

Problem

In verbal learning studies involving recall, the effects of word frequency, familiarity and association value are not completely understood. Deese (1961) doubts that word frequency is related to the free recall of words, and argues that once a word is well integrated it should be readily recalled regardless of word frequency. Cofer (1961), on the other hand, suggests that "response availability" probably would be due to frequency of prior experience. Noble (1953), using dissyllables, found that familiarity (estimated prior experience with the dissyllables) was highly correlated (.92) with associational m-values; and he suggests that both "familiarity" and "meaning" may be functions of the frequency of occurrence in an organism's history. Noble also calls attention to Thorndike's observation that the frequency of a word's appearance in writing is positively correlated with the number of synonyms for that word in the English language.

The purpose of this experiment was to investigate the relationship between the word frequency of both the stimulus and the response in a synonym recall situation. It was hypothesized that the higher the word frequency of the stimulus word, the higher the word frequency of the synonyms that would be elicited. It was further hypothesized that mean word frequency of the synonym responses would be a decreasing function of list position, i.e., initial synonym responses to a given stimulus word would be of higher mean word frequency than would later responses.

Method

Fifty-seven students enrolled in an educational psychology class comprised the sample.

Nine stimulus words were obtained from the Lorge-Thorndike (1944) list. Three Hi stimulus words (seem, ship, high) occurred more than 100 times in one million. Three Mod stimulus words (hasten, jewel, steep) occurred 40-41 times per million. Three Lo stimulus words (invest, operator, pinch) occurred less than 20 times per million.

Subjects were given a booklet containing the nine stimulus words, each on a separate page, and attempted to write as many synonyms as possible during the standard 2-min. interval allowed to each word. In order to minimize associative chaining of responses, each stimulus word was reproduced 15 times on the page with a space provided under each word for the subject's response.

The synonym responses to each word were assigned a "word frequency" score based on the Lorge-Thorndike counts, using the following table:

Word Frequency Score	Lorge-Thorndike Frequency/Million
4	100 or higher
3	50-99
2	25-49
1	1-24
0	0 or lower

Results and Discussion

Figure 1 shows the plot of mean word frequency of the synonym responses as a function of the frequency of the stimulus word and the list position of the response. An analysis of variance performed on these

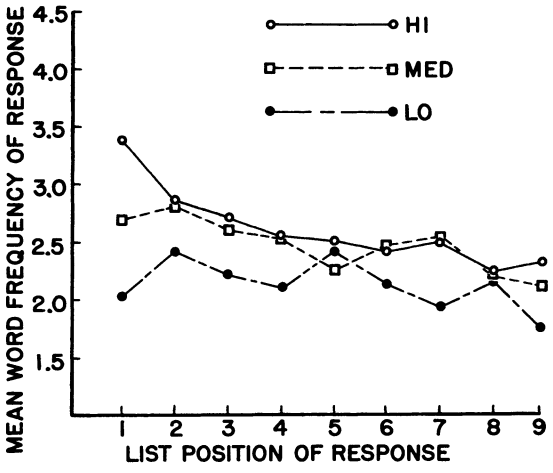

Fig. 1. List positions 10-15 are not shown here because too few subjects were able to give more than nine responses to the stimulus words. Although, as expected, number of responses decreased as a function of list position, the frequency of the stimulus word was not significantly related to the number of responses made ($F = 1.61$; $df = 2/8$; $p > .25$).

data showed a highly significant stimulus frequency effect ($F = 12.85$; df 2/16; $p < .001$) and a significant list position effect ($F = 2.97$; df = 8/16; $p < .05$). Inspection of the figure reveals that word frequency of the responses tends to be highest for the Hi stimulus words, followed by the Mod words and then the Lo words in accordance with our first hypothesis. The figure also reveals that mean frequency of the responses tends to be higher for the earlier list positions in accordance with our second hypothesis. If it can be assumed that the higher the word frequency of the response, the stronger the association with the stimulus word, these results would be consistent with findings from free-association studies (e.g., Skinner, 1937; Bousfield & Barclay, 1950) which show that strength of association tends to be a logarithmic function of rank.

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Notes

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