

The effects of sentence structure on the recall of low frequency words

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The recall of low frequency words presented in either sentence order or random order was found to interact with trials. The recall of words presented in sentence order was inferior on early trials but superior on later trials.

In an earlier study (Porter, 1968) evidence was obtained to support the contention that familiarity interacts with structure in verbal learning. In that study it was found (1) that with low frequency words sentence order impaired recall in the early trials, and (2) with high frequency words sentence order facilitated recall in the later trials. Training was limited to six trials, thus attenuating the interaction with low frequency words. The present study utilized eleven trials allowing the trends to develop more fully.

Method. In order to control for the time difference found in the original study a different apparatus was employed.¹ The apparatus consisted of a 6 in. diameter memory drum (author constructed) driven by a stepping switch. Recycling timers controlled the rate of rotation. A 3/8 in. x 16 in. viewing slot exposed one line on the drum.

Thirty-two low frequency (1 to 15 per million) words were taken from the general Thorndike-Lorge (1944) frequency norms.² For the sentence conditions, eight sentences of the form adjective-noun-verb-adverb were constructed. Three sets of sentence order and three sets of word order randomizations were employed.

The Ss were 32 undergraduate students from introductory psychology courses. They were assigned without bias to one of two groups. Half of the Ss received the words in sentence order and half received the words in random order. Each of the eight sentences was exposed for 4 sec, while each of the 32 words was exposed for 1 sec. Thus total exposure time was 32 sec per trial for both groups. Each set of words was presented for 11 trials. Following each

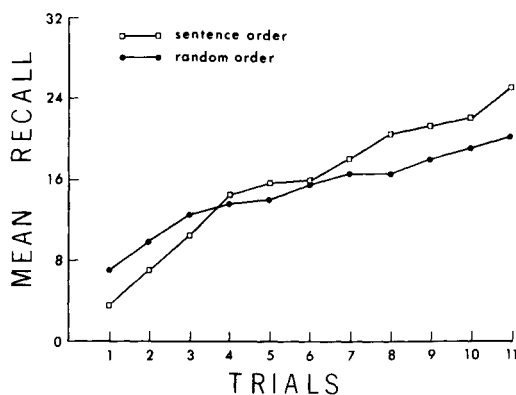


Fig. 1. Mean number of words recalled per trial.

trial a 2 min recall test was given using blank lined paper and pen or pencil. The Ss were instructed to recall as many of the items (words, sentences) as possible. Guessing was encouraged.

Results and Discussion. The dependent variable was the correct number of words recalled per trial. The performance of the two groups is illustrated in Fig. 1. A Lindquist Type 1 design analysis of variance test (Lindquist, 1953) revealed a significant interaction between level of linguistic structure and trials ($F = 7.91$, $df = 10/300$, $p < .001$). Data from Trials 1 and 11 were subjected to t tests with the following results: (1) significantly more words were recalled from the random order condition on Trial 1 ($t = 3.03$, $df = 15$, $p < .01$); (2) significantly more words were recalled from the sentence condition on Trial 11 ($t = 2.24$, $df = 15$, $p < .05$). Thus, the anticipated interaction was obtained.

The facilitative effects of sentence structure on recall have frequently been demonstrated in past research. The present results with low frequency words, however, revealed an initial inversion. There are two explanations which may be offered.

The first concerns the semantic organization involved in sentence meaning. Assuming that Ss utilize sentence meaning in order to facilitate retention, the difficulty (and resulting slower rate) of discovering the meaning of sentences composed of unfamiliar words could interfere with the recall of the specific words involved.

A second explanation is related to the effects of organization on recall. Studies by Waugh (1961) and Dallett (1963) comparing the effects of structured vs free-recall instructions obtained results similar to the present study. They found that Ss instructed to recall words in some specified order recalled fewer words (compared with free-recall Ss) on earlier trials but more words on later trials. Underwood (1966, p. 459) has suggested that the utilization of an organizational scheme in recall (although requiring the Ss to learn more) produces eventual facilitation irrespective of meaningfulness.

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NOTES

1. There was a .5 sec interval between slide presentations caused by the projector reset mechanism. Since a different number of slides was employed for the different groups, total trial time was not identical.
2. These stimulus materials were the same as those used in the earlier study for the low frequency conditions; the only difference being in the mode of presentation.