Order preference in serial learning

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Thirty-six Ss arranged three sets of 15 words into easy serial orders. Approximately three weeks later they were required to learn three serial lists derived from the same sets of words. One serial list conformed to S's own preferred order, one conformed to a preferred order developed by another S, and one was presented in a random order. Lists and presentation order of the three serial arrangements were counterbalanced. Serial learning was more rapid with easy orders, but there were only slight differences between the two preferred orders.

In a free-recall task there are no restrictions placed on the order in which Ss are allowed to record the items they are able to recall. Yet, even with a list of presumably unrelated words there is a marked consistency in recall orders across trials, and there appears to be some agreement between Ss in specific free-recall orders (Tulving, 1962). When restrictions are placed on order of recall, as occurs with serial-learning tasks, performance is facilitated if the required order parallels the common free-recall orders (Earhard, 1967; Tulving, 1965). The preferred serial order is derived from free-recall protocols by placing in adjacent serial positions items which frequently appeared in adjacent positions during free recall. Thus, the serial order is determined by normative free-recall orders. With lists of associatively related words, similar results have been obtained with variations in serial order designed to maintain the associative structure of the list (Weingartner, 1963).

In the present experiment each S learned three serial lists: one with the items arranged randomly, one with the items arranged according to the specific S's preferred serial order, and one with the items arranged according to some other S's preferred serial order. The preferred orders were determined from a prior task in which Ss arranged each list into an "easy-to-learn" serial order. The purpose of the present experiment was to determine if this direct method of identifying preferred serial order produced arrangements of words which facilitated serial learning. If Ss utilize idiosyncratic associations in constructing a preferred serial order, then there ought to be some advantage when one learns a serial list that corresponds to his own preferred order, as compared to a list that corresponds to some other S's preferred order.

METHOD

Materials

Each S was required to learn three serial lists of meaningful words. There were 15 words in each list, and the lists were selected from Deese (1959). Lists number 2, 8, and 11 were selected with interitem associative strength values of 4.3, 4.0, and 9.3, respectively.

Procedure

During the initial phase of the experiment Ss were required to arrange each list into a preferred serial order. The nature of a serial-learning task was briefly explained, and then Ss were asked to arrange the words in a sequence which they believed would be easiest to learn serially. The Ss were not informed that they would be required to learn the lists at a future date.

Approximately three weeks intervened between the ordering phase and the learning phase of the experiment. All Ss served in both phases. During the learning phase Ss were required to learn all three lists in immediate succession. Each S learned one of the three lists in the serial order he had used in arranging the words (Own), one list in the serial order some other S had used in arranging the words (Other), and one list in a random serial order (Random). The lists, conditions, and order of conditions within the learning session were counterbalanced. The Own, Other, and Random lists were each presented first, second, and third during the learning session an equal number of times, and each of the three lists of words was presented in the Own, Other, and Random conditions an equal number of times. The serial order of a list that was used in the Own condition for one S was also used for the Other condition by another S. Thus, the Own and Other conditions overlapped completely in serial orders utilized. Each list was arranged in a random order for the Random condition.

The lists were presented on a Stowe memory drum at a 1.5 sec rate. The method of serial anticipation was used in presenting the lists. Approximately 2 min intervened between successive lists. All lists were presented for 12 trials after an initial study exposure. A row of asterisks preceded the first item in the list. The Ss were not informed about the relation between the list orders and their participation in the previous ordering task.

Subjects

The Ss were 36 undergraduate students attending the summer session at the University of Nevada. Each S made an individual appointment to participate in the experiment, at which time he was randomly assigned to one cell in a 36-cell matrix. The cells in this matrix specified all possible treatment combinations used in the experiment. Thus, each S received a unique sequence of lists. The Own list in each cell was randomly paired with a cell containing the same list used in the Other condition. When an S was assigned to a cell, the serial order of a list for two Ss was determined: the list that was to serve in that S's Own condition, and the list that was to serve in some other S's Other condition.

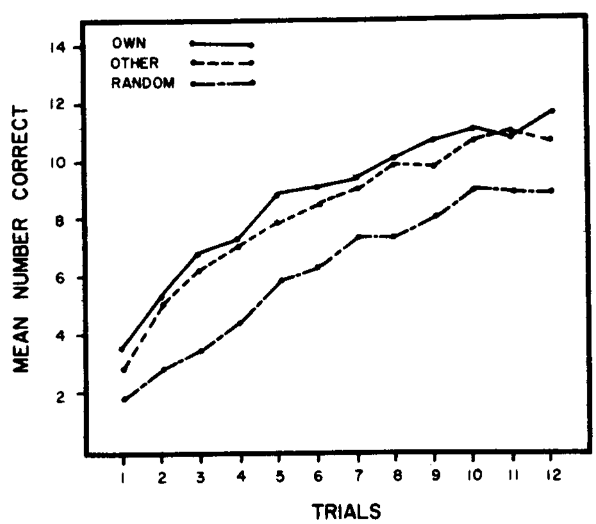

Fig. 1. Mean number of correct responses for Own, Other, and Random lists.

RESULTS AND DISCUSSION

The mean number of correct responses across trials are presented in Fig. 1. The most striking feature of these data is the consistent superiority of the Own and Other conditions compared to the Random condition. The design did not permit the evaluation of interactions, as they were confounded with Ss. In analyzing the data the serial-order effect was separated into two orthogonal components. The Random condition was compared with the combined Own and Other conditions to assess the effects of preferred order on serial learning. The Own condition was compared with the Other condition to determine whether idiosyncratic effects influenced the ease of serial learning. The results of the analysis indicated that the preferred orders facilitated learning, $F(1,66) = 83.40$, $p < .01$. The difference between Own and Other conditions did not reach an acceptable level of statistical significance, $F(1,66) = 3.46$. The only other significant source of variance was for the position of the lists within the learning sessions, $F(2,66) = 54.83$, $p < .01$. There appeared to be a practice effect as the mean number of correct responses per trial for the first list practiced was 6.05, for the second list the mean number of correct responses was 8.30, and for the third list the mean number of correct responses was 8.97.

Arranging items in a list according to some preferred order facilitates performance on a serial-learning task. The preferred order may be inferred from free-recall data (e.g., Earhard, 1967), or it may be inferred by directly requesting Ss to arrange items in an easy serial order. In the present experiment Ss were capable of constructing easy serial orders for one another. The difference between the Own and Other conditions was not significant. Apparently, allowing Ss to construct the serial order of a list they subsequently learned did not substantially alter performance, compared to learning a serial list that conformed to an easy order constructed by someone else. This result did not appear to represent a ceiling artifact on performance level as all groups performed well below mastery. On the final trial the Own condition still averaged fewer than 12 correct anticipations.

Although the advantage of self-arranged preferred serial orders was not statistically reliable, it may be noted from Fig. 1 that the Own condition surpassed the Other condition on 11 out of the 12 trials. It is possible that more sensitive procedures would reveal a reliable difference between the Own and Other serial orders. It should be mentioned that the Own condition had an advantage over the Other condition in addition to the possibility of utilizing idiosyncratic associations in constructing the list order. During the ordering phase of the experiment, all lists in the Own condition were exposed to Ss. The Ss did not see the serial orders that were used in their Other and Random conditions. Any learning which took place during the ordering phase would be more beneficial to the Own serial order relative to the remaining two serial orders. In view of the possibility of this prior learning advantage, and in view of the failure to find a significant difference between Own and Other serial orders, it is suggested that the role of idiosyncratic associations in the serial learning of these lists was relatively minor.

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