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Effects of narrative stories on recall*

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Effects of narrative stories on recall of words using lists of different interitem associative strength after different delayed intervals of recall were investigated. Sixteen lists of 10 nouns were presented to 36 Ss. Each S studies lists of different interitem associative strength. Four of the 16 lists were narrative report lists and were used only to control narrative Ss following instructions. Control Ss received a study time equal to that of their yoked narrative Ss. Ss were required to recall the lists immediately after learning, at the end of session, and either 7, 14, or 28 days later. Significant differences were obtained between the two study groups on a session recall test and on the delayed recall interval tests but not on immediate recall test. Statistical significance was also obtained among lists of different interitem associative strength; recall was greater from lists of high interitem associative strength than from either zero or low interitem associative strength. The results support and extend those reported by Bower and Clark.

In 1969 Bower and Clark reported that Ss who were asked to create narrative stories around unrelated words recalled significantly more words than Ss given no special instructions in the use of a mnemonic technique. Bower and Clark state that "the narrative Ss recalled six to seven times more than their yoked controls. There was no overlap in recall scores of the two groups on any list; the average of the median scores was 93% for the narrative Ss vs 13% for their yoked controls [pp. 181-182]." Several early experiments in our laboratory attempting to replicate and extend the results of Bower and Clark by using word lists of different interitem associative strength were not successful. The major difficulty in our experiments was the failure of our narrative Ss in constructing narratives when instructed to do so. Interviews with our Ss after the experiments revealed that about one third made up stories in learning the word lists. To insure that narrative Ss would create such narratives when their yoked control Ss would not, the present experiment required occasional reports of the nattatives constructed for particular word lists and after Ss learned of these lists, the narrative S were asked to give their stories. In this way it could be determined if Ss were constructing narrative stories and following instructions. Additionally, frequency and associative strength of words were controlled for each list. Frequency of occurrence was determined by the use of Thorndike and Lorge Tables, and associative strength by using lists of different interitem associative strength. Deese (1959) defines interitem associative strength as "the average

relative frequency with which all items in a list tend to elicit all other items in the same list as free associates [p 305]." Using the examples of words presented by Bower and Clark, no such controls were apparent in their word lists. The purpose of this experiment was to determine the effects of narrative stories on recall of words using lists of different interitem associative strength and to examine these effects over delayed intervals of recall.

METHOD

Thirty-nine female undergraduates from introductory psychology courses volunteered to participate in the experiment, and of these only 36 were used because three did not meet the criterion for inclusion as stated below. Eighteen of these Ss were assigned to a narrative group and 18 to a control group. Assignment to groups was random with the exception that at least one narrative S had to precede a control S. Each control S was then randomly yoked to a narrative S.

Each S was required to learn 16 word lists, four of which were report lists. Each list consisted of 10 nouns of a specified interitem associative strength. Words for these lists were selected from the Deese (1959) lists. Of the 12 lists (nonnarrative report lists) used in the data analysis, four were of high interitem associative strength, four of low interitem associative strength, and four of zero interitem associative strength. A list of each of the above interitem associative strengths and a mixture of the three interitem associative strengths were used for the four narrative report lists. The 12-word lists were arranged randomly into three different list order presentations. Each list order was used three times to control for the effect of list order. Within each list order, the 12 lists were assigned randomly into four blocks, each block containing one list of zero, low, and high interitem associative strength. In this way, the effects of associative value and ordinal position of the lists could be examined. The list order of the four narrative report word lists was the same for all Ss: the mixed list was first, while the other three lists of different interitem associative strengths were randomly presented as the sixth, eleventh or the last list.

All Ss were run individually. The narrative Ss were instructed as follows: "Today we are going to do an experiment in verbal learning. The materials we will use will be lists of real words. One way of learning a list of words is by use of a narrative procedure, by making up a story using the words so that they can be recalled in the same order in which they appear on the list. For each list given you will make a story using the words on the list. Make each story meaningful to yourself. Then when you are asked to recall the words you can simply go through your story and pull out the proper items in their correct order." The control Ss were instructed as follows: "Today we are going to do an experiment in verbal learning. The materials we will use will be lists of real words. You will be asked to learn each list and then recall the words in the order in which they appeared on the list. For each list there is a time limit. I will tell you when to stop."

The narrative S was handed the first list of words and then given her instructions. No time limit was given. When the S finished, she handed the list back to E who then recorded the time taken by the S. The S was then asked to recall orally the list just learned. The remaining 15 lists were presented in the same manner. Each control S received the 16 lists in the same order as her yoked narrative S, and for each list she had the same study time. After the immediate recall of the narrative report lists, the narrative Ss were asked to relate their stories. An example of one of the stories is: "I was struck with amnesia and was in a difficult POSITION. I couldn't remeber my NAME, or where

my COAT and HAT were, or my NATION. The CHIEF of police was sitting next to a PLANT and gave an INDICATION that I might be a STUDENT who just came from the OPERA." The Ss were not told previously that they would be asked to do this. A criterion was set that stories must be made up for at least three of the four lists or the data for that S were not included in the analyses. Three Ss failed to meet the criterion. Of those meeting criterion, no S failed to give stories on all four of the lists. After the 16 lists, all Ss were given a session recall test. Each S was asked to recall the first list again, the second list, and then the following 14 lists. The first word in each list was used as a cue for recall, and the Ss were asked to recall the other nine words in the list in their correct order. The Ss, without prior knowledge, were then brought back for a delayed recall interval test. These tests were given after 7 days, 14 days, and 28 days, with 6 narrative Ss and 6 control Ss tested at each interval. They were again asked to recall all 16 lists with the first word of each list given as a cue for recall.

RESULTS AND DISCUSSION

The recall scores for each list were tabulated in two ways: an all-or-none procedure, each list recalled in the correct serial order (all nine words in exact serial order), and the total number of words recalled. The results show that there was no significant difference between the recall of the narrative Ss and the control Ss on the immediate recall tests, but there was a significant difference on the session recall test. On the immediate recall of the 12 lists, the narrative Ss recalled 96.4% of the total words, and the control Ss recalled 95.3%. This shows that the time limits imposed on the control Ss by their yoked narrative Ss did not impair the immediate recall of the lists. The time taken by the narrative Ss in studying the lists ranged from 42 to 326 sec with a median time per list of 86.5 sec. No significant differences were obtained among words recalled for interitem associative strength. On session recall, however, the narrative Ss recalled 72% of the total words while the control Ss, only 33%. Constructing stories about words does not seem to affect immediate recall but significantly improves recall after the study of a large number of words [F(1,34) = 57.69, p < .01]. At the time of recall, Ss were asked to remember 108 words, and the mean number of words per list for the narrative Ss was 6.5, and for the control Ss, 2.9. Similar statistical results were observed on the recall scores of Ss for the lists of different associative strength. No significant difference between interitem associative strength lists on immediate recall, but significance on session recall [F(2,68) = 29.10, p < .01].

Tests of simple effects by the Newman-Keuls procedure revealed that mean of the high interitem associative strength lists was significantly different from the mean of the low interitem associative strength lists at the .01 level of confidence. The mean of the high associative lists was also significantly different from the mean of the zero interitem associative lists at p < .05. A greater number of words was recalled from high interitem associative strength lists ($\bar{X}$ = 6.0) than from

the zero ($\overline{X}$ = 4.5) and low ($\overline{X}$ = 3.6) interitem associative strength lists in that order. No significant difference was obtained between the means of the zero vs the low interitem associative lists. The ordinal position of the list was also significant [F(3,102) = 11.65, p < .01]. More words were recalled for the lists in the 3rd and 4th positions than in the first two positions. These results are portrayed graphically in Fig. 1. This figure shows clearly that the narrative Ss recalled more words per list than the control Ss and that this difference was also obtained for the three types of lists, with the exception of the high interitem associative lists of the control group at Ordinal Position 4. Three statistical significant interactions were obtained: Group by Associative Value of List [F(2,68) = 10.69, p < .01], Associative Value of List by Ordinal Position of List [F(6,204) = 3.82, p < .01], and the Group by Associative Value of List by Ordinal Position [F(6,204) = 2.61, p < .05]. Analyses of variance were computed on both recall scores by the all-or-none procedure and the total words recalled. Since both scoring procedures gave similar results, only the analyses with total words recalled are reported.

In the delayed recall interval tests of 7, 14, and 28 days, the narrative group was more superior in total words recalled than the control group [F(1,30) = 6.08, p < .05]. Constructing stories in learning lists of words enabled narrative Ss to recall with a cue more words per list ($\overline{X}$ = 6.2) than the control Ss ($\overline{X}$ = 4.1) after 7 or more days. However, further analysis of each delayed recall interval revealed that the significance between the groups occur only at the 7-day interval and not at the 14- or 8-day intervals. Statistical analysis at the 7-day recall interval revealed significances between groups [F(2,30) = 9.83, p < .01]. The interaction between Groups by Delayed Recall Intervals was also significant [F(2,30) = 6.17, p < .01].

As in session tests, more words were recalled from the lists of words of high interitem associative strength than of zero or low interitem associative strengths [F(2,60) = 91.77, p < .01]. This significance was obtained for interitem associative strength for each delayed recall interval. Further analysis of the types of lists by the Newman-Keuls procedure, indicated that the mean number of words recalled from the high interitem associative lists was significantly different from the mean of the low interitem associative strength list at p < .01, and the mean difference between the high and zero interitem associative lists was significant. These significant individual comparisons were consistent for all three delayed recall intervals. The interaction of Delayed Recall Intervals by Associative Value of List was also significant [F(4,60) = 2.56, p < .05].

The results of this experiment using narrative stories as mediators for serial recall of word lists of different associative strength support and extend those of Bower and Clark (1969). However, the number of words
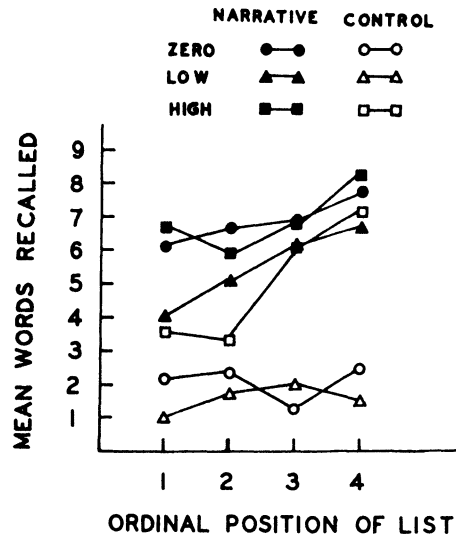

Fig. 1. Mean number of words recalled per interitem associative lists by narrative and control groups for ordinal position of lists in session delayed recall test.

recalled by the the narrative and control Ss in this experiment was not as great as reported in their Ss. Possibly the difference is attributed to the total and types of words required to be recalled by the Ss in the present experiment. In addition, some control Ss reported at the end of the experiment that they had used stories on some of the word lists and also indicated that these stories had assisted them in recalling the lists. The results of this experiment also partially support those of Boltwood and Blick (1970). In a comparison of different mnemonic techniques of learning lists of unrelated words, they reported that Ss using a descriptive story technique for learning recalled more words after 8 weeks than Ss using other learning techniques. However, in that study Ss were only required to learn a single list of words in a group setting and no controls were used to insure that the mnemonic techniques reported were used by Ss. Finally, in both session and delayed recall intervals some narrative Ss reported that they could not remember stories from the first word of the list given as the cue. Perhaps this is an inadequate cue or an inappropriate cue in recalling stories to lists and this may have had some effect on recall of Ss in the delayed recall intervals of 14 and 28 days. Using additional cues or fewer lists in future studies may provide answers to some of these questions.

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