Mediation speed, reported mediators and recall as related to presentation rate

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Abstract

Six groups of Ss learned adjective pairs with a 1-, 2-, or 4-sec. presentation rate in which total learning time was equated at 16 sec. Three groups were asked to give some way of associating the words in the pair, while the other three groups were given a recall test. The results showed: (1) no significant effects on latency of mediators although times were faster in the 4-sec. condition, (2) the number of reported mediators was greater in the 4-sec. group, (3) the number of reported mediators was greater following the mediation test rather than recall, (4) mediation speeds were faster on mediated items, and (5) recall was better with 2- and 4-sec. presentation rates.

Problem

In a previous study (Runquist & Farley, 1964), Ss were asked to form verbal mediating associations, and the latency of their responses was measured. The major findings of the study were: (1) learning the pair prior to the "mediation test" decreased the latency of the reported mediator, and (2) those items on which S reported using a mediator during learning showed shorter latencies than those items for which no mediator was reported. Although these data could be interpreted as indicating that the mediators were used in learning at least some of the word pairs, other interpretations are possible and, in fact, a case could be made that the latency of most mediators is too long to make the mediator of any use in rapidly paced learning tasks. The present study was designed to test the hypothesis that a rapid rate of presentation would inhibit the formation of stable mediators during learning and would result in longer latencies when Ss were asked to report their mediators.

Method

Six groups, each consisting of 15 undergraduates learned a list of eight pairs of adjectives arranged with low intra- and inter-pair similarity. The pairs were exposed to S one at a time at a rate of either 1 sec., 2 sec., or 4 sec. per pair. The S was required to study the pairs during this phase of the experiment and to try to learn to associate the word on the right with the word on the left. Two groups learned at each presentation rate.

Following the learning trials, one group at each presentation rate was given a mediation test in which pairs of words were shown to S one at a time and he was required to make up some way of associating the two words. The remaining three groups received a recall test in which the left member of the pair was shown

and the S was required to give the right member of the pair. Immediately following either the mediation test or the recall test, S was asked to indicate those pairs on which he had used mediators in learning the list.

During the learning phase, several repetitions of the word pairs were given, with the order of the pairs being different on each repetition of the list. Variations in total study time were controlled by giving different numbers of repetitions to each group so that the total study time for each pair was 16 sec. Thus, the pairs were presented 16 times each at the 1-sec. rate, eight times each at the 2-sec. rate, and four times each at the 4-sec. rate.

The mediation test was given immediately after learning. The S was told that he would see the pairs one at a time and that he should make up some kind of association between the items making up the pair. Several examples were given. As soon as he thought of a mediator he should press a button located in front of him, then write the mediator on a sheet of paper provided. As each pair was shown, a clock started which was stopped when S pressed the button.

In the recall groups, the left members of the pair were shown to S one at a time. If he gave a wrong response or if 6 sec. elapsed with no response, the next item was shown. Latencies of all correct recalls were recorded manually.

Results

The number of items for which Ss report mediators are presented as the first two rows in Table 1. Row 1 represents the results from the groups having the mediation test, and Row 2 the results from the groups having recall. The data show: (1) the mediation groups show an increasing number of mediators reported as presentation rate decreases, and (2) the number of reported mediators is consistently larger in the groups having the mediation test as opposed to the groups having recall. Both main effects were significant by analysis of variance. Within the mediation groups, the differences between the 1-sec. and 4-sec., and 2-sec. and 4-sec. means were significant, while the 1-sec. and 2-sec. groups did not differ. Within the recall conditions, the only significant difference was between the 1-sec. and 2-sec. groups. Comparing the mediation group with the recall group for each presentation rate resulted in significance at 1 and 4 sec., but not at 2 sec.

These results, then, indicate more mediators at a 4-sec. rate than at the other presentation rates, but only when the mediation test is given prior to questioning

TABLE 1
MEANS OF REPORTED NUMBER OF MEDIATORS,
MEDIATION SPEEDS, AND NUMBER RECALLED

Presentation Rate	1-sec.	2-sec.	4-sec.	error
Reported Mediators				
Mediation Group	3.9	3.5	5.9	1.67 *
Recall Group	.7	2.3	1.3	1.67 *
Mediation Speed				
All Items	.23	.22	.34	.946*
Mediated Items	.29	.29	.36	.031#
Non-Mediated Items	.19	.17	.13	.015#
Number Recalled	2.3	4.2	3.8	1.6 *

* estimated standard error of mean

within groups variance

S concerning the mediators. The elevated mean for the 2-sec. recall group appears to be anomalous and in all probability represents a sampling error.

All time measures were converted to reciprocals and averaged over the eight times for each S. The mean of these averages for each group is presented in Row 3 of Table 1. The results follow the same pattern as the number of reported mediators in that the most rapid mediation times are produced following learning at a 4-sec. rate, but the differences are not significant.

A comparison of the mediation time on items for which S reports using a mediator and those for which he reported no mediator was made. Only Ss who claimed to use mediation on some items and not others are considered in order to avoid a sampling bias with respect to the two kinds of items. Thus, for these analyses, the N's are 11, 9, and 13 for the 1-sec., 2-sec., and 4-sec. groups respectively. For each of these Ss the average reciprocal mediation time for "mediated" and "non-mediated" items was computed. The means of these averages across Ss are shown in rows 4 and 5 of Table 1. Differences between the groups are generally quite small, although the findings are consistent with the previous study (Runquist & Farley, 1964) where the mediated items showed more rapid mediation times. Separate analyses of variance revealed that the mean speeds did not differ between the groups for either mediated or non-mediated items. The times for the mediated and non-mediated items were compared for each of the three groups and resulted in significant differences in the 2-sec. and 4-sec. groups, but not in the 1-sec. group, primarily because of one S who

showed a rather large reversal. In all groups only two of the 33 Ss showed faster times on the non-mediated items.

The sixth line of Table 1 gives the mean number recalled by the recall groups. Statistical analysis showed that the 1-sec. group was inferior to both 2- and 4- sec. groups.

Discussion

These results could reflect the fact that additional study time at the slower rate of presentation gives Ss a chance to think up mediators. The fact that mean mediation speed scarcely differed at all between the groups for both mediated and non-mediated items suggests that the differences between groups in mean time over all items, even though not significant, are a reflection of changes in the number of items on which mediation occurred. It appears that the obtained differences in number of mediated items reported simply are not large enough to overcome other factors which determine mediation speed but which are not related to the use of the mediator in learning, e.g., individual differences between Ss and between words for individual Ss. The fact that amount of learning differs with presentation rate confounds the interpretation of the present results to some extent. It is not now possible to state whether the obtained differences in mediation are due to presentation rate per se or to better learning. It is possible, however, that better learning at slower rates is produced by more effective mediation, although the present data are not conclusive.

The differences in reported mediators between recall and mediation groups could be taken as an indication that the whole process of querying Ss concerning mediators is useless, and that the relationships obtained in the various studies where this technique has been used represent rationalizations rather than causal relations. Although this possibility cannot be denied, it is possible that the Ss in the recall group did not understand the instructions in regard to what they were supposed to indicate and, hence, used a different criterion for a mediated and non-mediated item than the Ss in the mediation test groups. If this is not the case, the extent of mediation actually occurring undoubtedly has been overestimated in previous experiments.

References

- Runquist, W. N., & Farley, F. H. The use of mediators in the learning of verbal paired associates. *J. verbal Learn. verbal Behav.*, 1964, 3, 280-285.