The A-B, B-C_r, A-C mediation paradigm: Recall of A-B following varying numbers of trials of A-C learning [1]

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Mediated interference in the A-B, B-C_r, A-C paradigm was investigated, using materials and procedures similar to those known to produce reliable mediated facilitation. In addition, recall of A-B was measured following either 0, 3, 7, or 15 trials of A-C learning. No evidence for mediated interference, in either the A-C acquisition or the A-B recall data, was found. It was concluded that the mediating processes in interference and facilitation paradigms may be quite different.

Though mediated interference has been demonstrated on several occasions (e.g., McGehee & Schulz, 1961), this phenomenon has received considerably less attention in the laboratory than its "counterpart," mediated facilitation. In an effort to determine whether the conditions which are requisite for the demonstration of the latter are the same as those needed to produce the former phenomenon, performance in the A-B, B-C_r, A-C paradigm was investigated with materials and procedures known to consistently produce large amounts of mediated facilitation in the A-B, B-C, A-C chaining paradigm (Schulz, Weaver, & Ginsberg, 1965; Schulz & Weaver, in press).

In the A-B, B-C_r, A-C paradigm the Stage 2 stimuli and responses are paired such that the A-B-C_r mediation chain leads to an incorrect C response in Stage 3. Therefore, the amount of interference produced by this paradigm should be greater than that due to interlist negative transfer under nonmediated control conditions (i.e., an A-B, B-E, A-C paradigm). The latter is an especially suitable control since the nonmediational sources of transfer for it and the interference paradigm are identical.

Furthermore, in light of the recent evidence that productive inferences regarding mediational processes can be based on the results of a test for A-B recall following Stage 3 A-C acquisition (e.g., Horton & Wiley, 1967; Schulz, Liston, & Weaver, in press), A-B recall was measured at four different points during the acquisition of A-C. Thus, A-B recall served as an index of the status of the A-B-C_r mediation chain during the course of A-C learning. If this chain of associations is "extinguished" or unlearned by virtue of its tendency to eventuate in an inappropriate C response, then A-B recall may be expected to decrease as a function of the number of A-C trials preceding recall and this decrease may be expected to be greater under interference than under control conditions.

Method

Eight independent groups of 20 Ss each were used, four mediated interference groups learning under the A-B, B-C_r, A-C paradigm (Conditions BC_r-0, BC_r-3, BC_r-7, and BC_r-15), and four control groups learning under the A-B, B-E, A-C paradigm (Conditions BE-0, BE-3, BE-7, and BE-15). Each of the four BC_r groups and each of the four BE groups received either 0, 3, 7, or 15 trials of practice on A-C before A-B recall was tested.

Each list consisted of eight paired-associates. The A terms were Taylor (1960) paralogs of low meaningfulness (m). The B and D terms were common nouns (T-L frequencies of AA) having minimal associative overlap in the Russel & Jenkins (1954) norms. Low m Archer (1960) CVC trigrams served as C (or C_r) and E terms. Intralist and interlist similarity were as low as possible in both paradigms. Four random orders of each list were used.

All lists were presented on a Stowe memory drum, using the study-test method. Both members of a pair were presented together at a 2-sec rate on study trials. On Stage 1 test trials the A terms were presented at a 2-sec rate and S was asked to say aloud the appropriate B term. Multiple-choice test trials were employed in Stages 2 and 3. On these trials the stimuli were presented at a 3-sec rate with four response alternatives numbered from 1 to 4, and S was instructed to say the number of the correct response. The incorrect alternatives were randomly selected from among the response terms of a given list, and each possible alternative occurred approximately equally often in each position. Learning was to a criterion of two successive correct test trials in Stages 1 and 2; the number of trials in Stage 3 was dictated by the treatment condition. Stage 4 was the same for all Ss. The A terms were presented at a 1.5-sec rate and S was required to say aloud the B term which had been paired with A in Stage 1.

The Ss were 160 University of Iowa undergraduates who were naive with respect to PA procedures and the materials used. The Ss were assigned to a prerandomized order of the treatment conditions as they reported at the laboratory, with the restriction that each of the groups contained 8 males and 12 females.

Results and Discussion

The mean numbers of trials required to learn A-B

Table 1 Mean total numbers of correct responses in Stages 3 and 4, and their standard deviations

Condition	Stage 3 $\bar{X}$	Stage 3 SD	Stage 4 $\bar{X}$	Stage 4 SD
BC_r-0			5.95	1.23
BE-0			5.50	1.76
BC_r-3	10.85	3.47	4.30	1.84
BE-3	10.45	4.59	3.65	2.35
BC_r-7	26.35	8.79	3.40	1.82
BE-7	30.35	7.60	3.60	1.76
BC_r-15	71.95	20.42	3.45	2.04
BE-15	79.90	18.84	3.10	2.20

ranged from 9.25 to 12.75; the same means for Stage 2 (B-C or B-E) ranged from 7.30 to 9.60. The groups were not significantly different for either of these stages, implying that the combinations of different Ss and different lists did not lead to different performance in either of these stages.

The mean total numbers of correct responses in Stage 3, the mean total numbers of correctly-recalled B terms in Stage 4, and the corresponding standard deviations, for each treatment condition, are presented in Table 1. It is clear that there was a tendency for the mediated interference paradigm to produce poorer performance in Stage 3, though none of the differences was reliable and there was a slight reversal in the BC_r-3 vs BE-3 comparison. The only Stage 3 difference which approached significance was that between BC_r-7 and BE-7 ($t = 1.54$, $df = 38$, $.05 < p < .10$).

It should be noted that, because of the method of selecting the incorrect response alternatives, the C_r terms were explicitly present among the incorrect alternatives for only 44% of the A-C test items. Although mediation theory predicts interference even if the C_r terms had never explicitly occurred among the alternatives (as would be the case if recall rather than recognition were required in Stage 3), this fact could have been a contributor to the present results. However, a further analysis of those items for which C_r was present as an alternative indicated that the predicted amount of interference did not obtain, even for these test items.

Returning to Table 1, it may be seen that recall of A-B was inversely related to the number of A-C learning trials ($F = 13.64$, $df = 3/152$, $p < .01$), a result in agreement with the findings of investigators using a two-stage transfer paradigm (cf., Barnes & Underwood, 1959). However, the differences between the BC_r and BE groups were small and not statistically reliable. The latter result is in complete accord with that for Stage 3 performance in that the prediction for differential decline in A-B recall was based on the presumed occurrence of mediated interference; such interference apparently did not play a significant role under the present conditions.

Several possible explanations for the failure to find mediated interference may be offered. For example, in a recent experiment Horton & Wiley (1967) used recall procedures in all three stages of the A-B, $B\text{-}C_r$, A-C paradigm and reported significant interference effects. This result suggests the possibility that the use of recognition procedures in Stages 2 and 3 may have attentuated the interference effects in the present experiment. It might be expected, for example, that requiring recall rather than recognition in Stage 2 would make the C_r terms more "available" to S, and, hence, these terms might produce greater mediated interference under those conditions. In any case, since the use of the present materials and procedures, in the appropriate paradigms, has consistently resulted in large amounts of mediated facilitation (cf., Schulz et al, 1965; Schulz & Weaver, in press), there are apparently important, but as yet not understood, differences between the mediation processes in facilitation and interference paradigms.

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Notes

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