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ABSTRACT

The effect of presentation time on learning under varying mediation instructions demonstrated a time-dependent difference in the facilitating effect of imagery generation or sentence generation instructions. Subjects were junior high school students working in a paired associate task with concrete nouns. Both cognitive strategies were more effective than none or a repetition technique for this learning task. The study suggests that shorter time intervals should be investigated to establish minimum times for verbal and imaginal processing. Instruction in the use of varying cognitive strategies may prove to be a useful teaching tool at all levels of education. (Author)

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PRESENTATION TIME AND COGNITIVE STRATEGIES IN VERBAL LEARNING

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Previous research suggests that both imagery and verbal cognitive strategies mediate the learning of concrete nouns. The purpose of this study was to investigate the effect of presentation time on the learning of paired concrete nouns under varying mediation techniques.

Ninety-six volunteers of both sexes from a local junior high school participated in the experiment. Of these, forty-eight were from 7th and forty-eight from 9th grade.

The experiment was set up as a 2 x 2 x 4 factorial design, with grades 7 and 9 as levels of factor 1, presentation rates of 3 seconds and 6 seconds as levels of factor 2, and instruction in cognitive strategies as levels of factor 3. The instructions were of four kinds: I = imagery ("Form pictures in your mind combining these two objects to help you remember them"); S = sentence ("Construct sentences in your mind combining these two objects to help you remember them"); C = control ("Try really hard to remember these two objects"); R = repeat ("Say the names of these

objects over and over in your mind to help you remember them").

Subjects were administered one of the instructional treatments at one of the presentation speeds in small groups of mixed grade. The presentation intervals were automatically timed, and the objects were presented as negative (white on black) slides. Treatments and speeds were selected in random order. A study-test format was used.

Prior to the set of two trials, subjects were given the appropriate instructions and shown four appropriate examples by means of transparencies and overhead projector. After instructions and examples had been given, the study set of thirty-six slides of paired objects were presented in random order at the selected interval (for the 3 second interval, the actual exposure time was 2.25 seconds with a blank screen for .75 seconds. For the 6 second interval, the actual exposure was 5.25 seconds). The test slides were then presented at 12 second intervals, during which the subjects recorded their responses on lined and numbered sheets of paper. One of the examiners kept track of the stimulus number aloud to minimize error. A second identical study-test trial followed.

As expected from previous work by numerous people, subjects who were expressly instructed in the use of imaginal or verbal mediation learned significantly better than did the control subjects who were either exhorted to remember the pairs or to repeat the pairs' names as a method of learning. Indeed, repetition seemed to interfere with learning, compared with the noninstructed C group.

Orthogonal contrasts of instructions and grades were nested under

presentation times. Under the 3 second presentation time, the C group performed significantly better than did the R group, whereas under the 6 second rate, C and R were not significantly different. Under the 3 second presentation time, I instructions were most facilitative for both 7th and 9th graders. Under the 6 second presentation time, the differential effect of I or S instructions vanished for 7th graders, while S instructed 9th graders did slightly better than I instructed 9th graders. Under both presentation times and for both grades, instruction in either cognitive strategy was helpful in learning of the paired associates, i.e. combined I + S groups did better under all conditions of presentation time and grade than did combined C + R groups.

It appears, then, that whereas either sentence generation or image generation is effective at presentation time of 6 seconds, imagery generation is superior to sentence generation for junior high school boys and girls at the faster rate of 3 seconds. Whether this is indeed differentiating the times required for verbal or imaginal processing cannot be determined on the basis of these data; however, the study does suggest that in order to investigate the separation of sequential and parallel processes further, controlled presentation times of under 3 seconds will need to be employed. Possibly 3 seconds is too long to frustrate attempts at using apparently sequential verbal strategy, although not allowing as efficient use of verbal mediation as of imaginal mediation.

The scientific importance of work such as this is its contribution to understanding the basic cognitive processes. Identifying these processes

as parallel or sequential and determining the conditions under which each or both will occur is of basic importance to learning theory. Since the processing cannot be directly observed, it is necessary to resort to strategies such as timing so that at least hypothetical models of information processing may be constructed.

Perhaps of more importance, certainly of equal importance, is the contribution to teaching methods these findings make. If teachers are made aware of the uses of cognitive mediators in learning, and of the relative ease with which they can teach their pupils these strategies, then teachers and students both will become more efficient learners. Since a certain amount of memory work is necessary even to the most discovery oriented or problem solving approach to teaching, and at all educational levels, the efficiency with which this memory work can be accomplished will be important to educators and educatees.