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ABSTRACT

Evidence was found for an ability to monitor during learning the degree of retrievability of the to-be-learned material from memory at time of a subsequent test. Students were given three successive study trials to learn either a list of 60 paired associates or a free-recall list of 60 "unrelated" words. During a fourth study trial, they rated on a 7-point scale how confident they were that they would recall the item on a later test trial. Performance on the subsequent test was a monotonic increasing function of rating for both tasks the slope being greater for paired associates. (Author)

Prediction During Learning of Later Retrievability [1]

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There is evidence, in such phenomena as the "tip-of the-tongue" state, that people can monitor memory for events which are not readily accessible at the moment. The present research dealt with a related phenomenon: the extent to which an individual can monitor or predict, while engaged in study of verbal material, his later success in retrieving specific information from memory. This ability was examined in the context of two laboratory tasks: a) bidirectional paired-associate (PA) learning in which students studied word pairs knowing that later they might be show either one and would have to attempt to recall the other, and b) a free recall task in which they studied a list of words and then, with no specific cues provided, recalled as many words as they could from that list.

Method

Materials

The stimulus materials were 120 nouns chosen from the norms of Paivio, Yuille & Madigan (1968). All words had T-L frequencies greater than 20, with imagery, concreteness and meaningfulness values above 2.5, 2.9, and 4.0, respectively, in those norms. Word lengths ranged from 5 to 9 letters; synonymity and obvious strong associative relations between words was minimized by inspection.

Procedures

In the bidirectional PA task, students were asked to study each of 60 word pairs so that they could recall

either word if given the other. The pairs were presented for three successive study trials (with no intervening tests) at a rate of 3 sec. per word. On a fourth trial the pairs were shown at a 5-sec. rate and the students were to rate each pair on a 7-point scale for how well they thought they would be able to recall one member of the pair when shown the other. A 7 on the scaled was labelled as "certain that you can recall either word" while a 1 on the scale indicated that the student felt that he could not recall either word if given the other. Following this rating trial a single test trial was given at a 6-sec. rate; for half the pairs the first member was shown and for half the second was presented at time of test. Order of word pairs was varied across the three study trials and the test trial involved still another order. On the test trial the students were required to write down a response to each word shown (their best guess); this step was taken to minimize any effects due to confidence or criterion differences.

In the free recall task students studied 60 single words presented successively at a 3-sec. rate for three study trials with no intervening tests; order of the words was varied from trial to trial. A fourth study trial was given at a 5-sec. rate and during this trial each word was to be rated on the 7-point scale for how well the student thought he would be able to recall that word. After collection of the rating sheets and a brief instruction, the students were allowed 5 min. to recall as many words from the list as they could.

Subjects.

The students participating in these experiments were undergraduates at the University of Virginia enrolled in the summer session; forty students served in each of the two tasks. The students served singly or in small groups, each student receiving only one of the two tasks.

Results

The conditional probability of recall, given the rating that the student has assigned to that word, or pair, is shown in Figure 1. These probabilities are clearly a monotonic increasing function of the ratings assigned; this function is somewhat steeper in the case of the P-A task than for the free recall task. Although the predictive ability is somewhat better for the P-A than the free recall task, even in the free recall task which involves a minimum of recall cues, the students were able to monitor to an appreciable degree their later ability in a memory task.

In the P-A task there was a significant product-moment correlation (.40) between the mean of a given student's ratings and the number of words he successfully recalled, as well as a significant correlation (.76) between the mean rating which each word was given and the number of students who recalled the word ($ps < .002$). In free recall neither of these correlations was significant.

Conclusions

The present studies give clear, empirical evidence of students' ability to monitor, while studying, their

later ability to retrieve material in a verbal memory task. Their performance in the free recall task is particularly impressive since this task involves a minimum of experimenter-provided cues at time of recall, and so the student must be accurately monitoring the relative effectiveness of storage-retrieval strategies which he himself devises for the particular words.

References

Paivio, A., Yuille, J. C., and Madigan, S. A. Concreteness, imagery, and meaningfulness values for 925 nouns. J. Exp. Psychol.; 1968, 76, No.1, part 2.

Footnote

1 - This study was conducted by Gayle Price of Furman University while visiting at the University of Virginia as an NSF Undergraduate Research Participant. A paper based on these data was presented at the 1974 meetings of the Psychonomic Society in Boston.

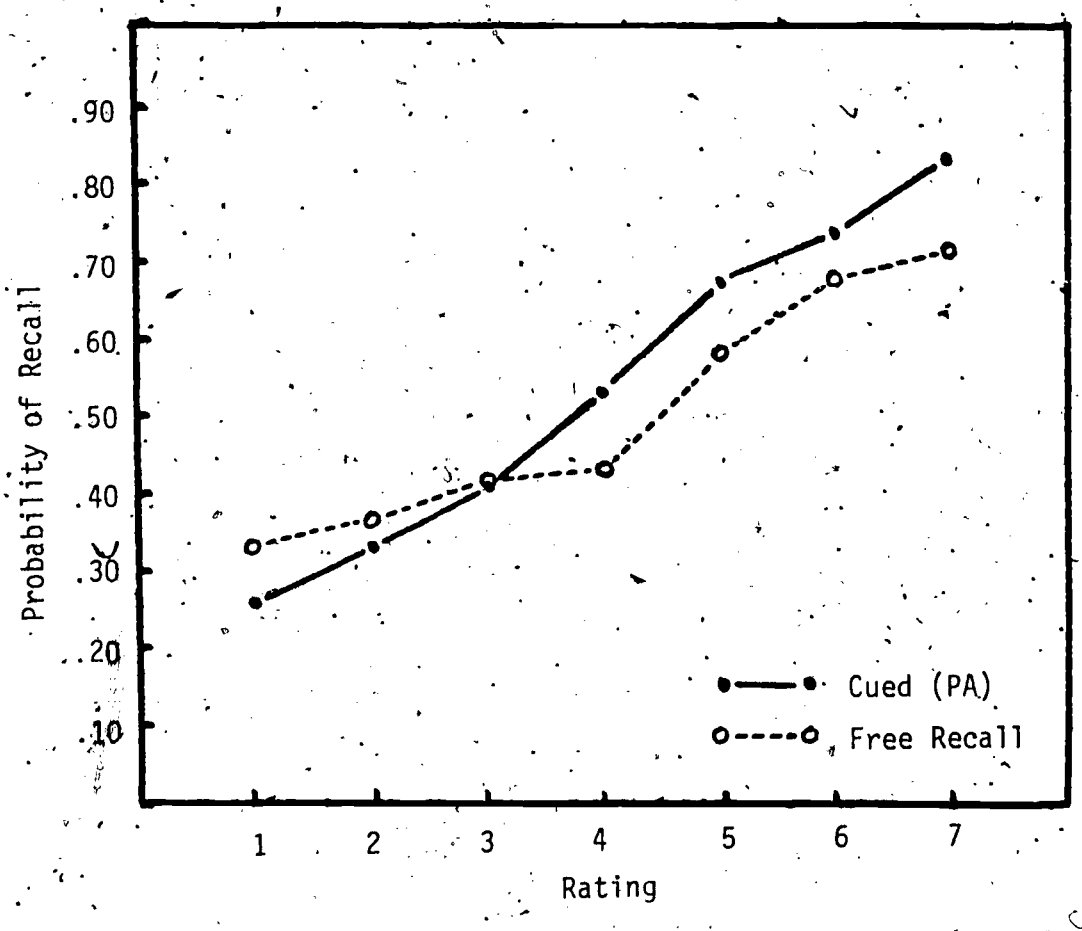

Fig. 1. Probability of recall conditional upon rating the word received for the Cued (PA) and Free Recall tasks.