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IMPLEMENTING RECALL

H. J. HAVERKAMP

The use of tests as schoolroom aids to learning has long been advocated. The conditions under which these benefits accrue have not, however, been fully explored. This paper is a summary of one of several recent studies at the University of Iowa which have sought information on this problem.

An attempt was made, in the investigation reported below, to compare the effectiveness of a reading and a rereading of factual material with that of a reading and a completion test response. Specifically, three learning conditions were compared: (1) the reading of a selection of factual material followed by the taking of a completion test as a review exercise; (2) a single reading of the factual material, and (3) a reading of the factual material and a rereading of the material as a review exercise. A criterion test administered immediately after learning provided a measure of retention for the comparison of the three conditions.

The basic material used in this study was an article dealing with the history and development of the census, taken from the *Encyclopedia of the Social Sciences* (1). The article was shortened to approximately 4,000 words, and from it was constructed a forty-item short-response completion test, and a thirty-item multiple-choice criterion test. The two exercises were so constructed that twelve items in each test dealt with corresponding facts or concepts. These comparable items, it was thought, might provide some specific measure of the value of a completion test recall as a review procedure. Also, a number and code exercise, requiring a minimum of reading, was constructed and used as a control activity for the purpose of keeping the single reading group occupied while the two review groups were occupied with their supplementary exercises.

The subjects used were upperclass and graduate students in education and psychology at the State University of Iowa. Four undergraduate classes in education, ranging in size from 45 to 75 students, and one psychology class of 25 students, predominantly graduate, were used intact.

Prior to beginning the experiment, the materials were organized into booklets. Booklet I contained a copy of the text material,

(1) Willcox, Walter F., "Census," *Encyclopedia of the Social Sciences*, 1937, Macmillan Company, New York, Vol. II, pp. 295-300.

the completion test exercise, and the criterion test; Booklet II contained a copy of the text material, the number and code exercise, and the criterion test; and Booklet III contained only the text material and the criterion test. These booklets were arranged in random order and distributed, face down, to the subjects. Persons receiving Booklet I automatically became members of experimental Group I, the test response group; those receiving Booklet II belonged to Group II, the control group; and subjects receiving Booklet III became members of Group III, the rereading group.

After each person had received a booklet, a signal was given for the subjects to begin reading the text material. Eighteen minutes were allowed for this activity. Immediately following this period a second interval of eight minutes was allowed, during which the members of Group I filled in blanks in the completion test; Group II worked at the number and code exercise; and Group III reread the text material. At the end of this period all three groups were instructed to turn to the criterion test and to begin work at once. Fourteen minutes were allowed for this last activity, after which the papers were collected.

Exactly one week after the first presentation of the material the students were retested, using the same multiple-choice criterion test which had been used previously. The students, meanwhile, had been given no opportunity to refer to the materials, nor had they any indication that a second testing was to take place. A fourteen minute interval was provided for this testing, also.

The scores made by individuals in the five classes on the immediate and delayed test provided two sources of data by which the relative effectiveness of directed recall, of the type used in this study, and rereading might be compared. The means for the three methods groups, on the immediate and delayed criterion tests, are as follows:

	Immediate Criterion Test	Delayed Criterion Test
Methods Group I (Recall)	18.88	17.87
Methods Group II (Control)	17.69	16.58
Methods Group III (Rereading)	20.44	19.07

For determining the significance of the differences between these methods means, the method of analysis of variance was used. The analysis shows that, for the immediate criterion test, the dif-

ference between the means of the rereading and control groups is significant at the 1% level of confidence; the difference between the means of the rereading and recall groups is significant at the 5% level of confidence; the difference between the recall and control groups is not significant. For the delayed criterion test, administered one week after learning, the mean of the rereading group differs significantly from the single reading (or control) group at the 5% level of confidence; the other differences are not significant.

A further analysis of the response to the twelve comparable items in each of the completion and multiple-response tests failed to show any evidence that, for the conditions of this experiment, recall in the form of a completion test is superior to rereading as a form of review.

In the light of the facts presented above, it appears that for college students there seems to be some justification for suggesting that reading and rereading are more productive of learning than a single reading followed by an equivalent amount of time spent reacting to a completion test designed to stimulate recall of the principal facts contained in the material, at least for the length of time allowed for the two activities employed in this investigation.

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