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A Comparison of Absolute Overlearning on the Retention of Fast and Slow Learners

By ALBERT R. RUSTEBAKKE, ROBERT KREIDER,
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Various studies on the relation of speed of learning to retention have been reported (2) (3) (4). Many such studies are subject to the criticism that the degree of learning of fast and slow learners was not equated. Gillette (1), using the method of "adjusted learning", found that fast learners retained more than slow learners as measured by both recall and relearning. Her study has set the pattern for subsequent investigation.

A question may be raised, however, as to whether the degree of learning is actually equated by the method of adjusted learning. The acquisition curve for the fast learner rises at a more rapid rate than for the slow learner. Hence, when a criterion of learning is established, the training trial that achieves the criterion will carry the fast learners more above the criterion than it will the slow learners. The fast group then actually has a greater response tendency than the slow group, or the degree of learning is not equal.

The present paper reports a preliminary study of an investigation designed to test the above reasoning and the further deduction that the effectiveness of overlearning on retention should vary depending on the speed of learning and should be of most value for the fast learner.

This would follow in that the overlearning trials would occur in the early part of the acquisition curve for the fast learners and hence, each overlearning trial would produce a considerable increment in habit strength. However, for the slow learners, the increment in habit strength would be much less since the overlearning trial came much later in the acquisition curve when the curve is less steep.

This study served as a pilot investigation to work out methods and techniques. Even so, it appears to be worth reporting, for it taps a variable apparently not elsewhere reported in the literature, i.e. overlearning in relation to speed of learning.

The aim was to measure retention, immediate and delayed, for a group of fast and slow learners who had received the same

number of overlearning trials on each of a list of nonsense syllable pairs.

PROCEDURE

Subjects

In order to select subjects, seventy-nine experimentally-naive volunteer college students learned a list of six nonsense syllables of zero association value presented on a standard memory drum. They were learned by the method of serial anticipation to a criterion of two successive correct anticipations. Eight fast and eight slow learners were then selected as subjects in the experiment. The fast learners were all at least one standard deviation below the mean of the total distribution of trials to learn, and the slow were all at least one standard deviation above the mean. A "t" test yields a value of 12.13, which with 14 d.f. is significant far beyond the 1% level of confidence.

Apparatus

The sixteen students so selected were then required to learn a list of nine sets of paired associate nonsense syllables of zero association value, all differing from those used in selecting the subjects. They were presented on a memory drum which had been modified to allow the order of the individual cards containing the paired associates to be changed quickly between trials.

Procedure

Standard instructions explaining the task were read to the sixteen experiment subjects. They were told that after they had learned a given paired associate to a certain criterion it would be withdrawn and that several of the cards would be shifted on every trial. Each card containing the paired associates was exposed for three seconds. The modification of the memory drum required a three second blank exposure between cards. A thirty second rest period between trials was allowed to permit shifting the cards for the next trial, but rehearsal was prevented by requiring subjects to sort cartoons. Following each trial, two paired associates were shifted to new positions, and if the subject had spelled one of the paired associates correctly on that trial, it was shifted to a new position. The criterion of learning for each paired associate was two successive correct anticipations. After which, four more trials were given and then the card was withdrawn. The list was thus gradually shortened, but all time intervals were kept constant. Following the learning of the entire list, subjects were kept occu-

ped for one hour by filling out a rating sheet, after which they were given a list of the stimulus syllables and asked to write out the paired response syllable. All were questioned about rehearsal during the time between learning and the recall test. All indicated surprise at the recall test and disavowed rehearsing during the time period.

A week later an attempt was made to get all of the subjects back for a second recall test.

Results

A test of significance was first run to determine if the pre-test actually had obtained a sample of fast and of slow learners. The mean number of trials to learn for the fast group was 20.4 and for the slow group 38.8. The "t" value is 3.6 which with 14 d.f. exceeds the 1% level of confidence.

The mean recall scores of the two groups after a one hour delay was eight for the fast group, and 3.38 for the slow group. This difference yields a "t" value of 6.13 which is highly significant with 14 d.f.

Due to various factors beyond control it proved to be impossible to contact all of the subjects after the lapse of a week. Five of the fast group were tested and their mean recall score was 6. Six of the slow group were contacted and their mean score was 3.33. This produces a "t" value of 3.21 and a "t" of 3.25 is necessary for significance at the 1% level with 9 d.f. However, the second mean recall was only 75% of the first while for the slow group the second recall was 98.5% of the first recall score.

Since this appeared to be strange, the experiment was re-run a year later with different subjects. The immediate recall was 6 for the fast learners and 3.78 for the slow, a difference significant at the 2% level. All of the subjects were contacted for the recall a week later. The mean of the fast was 3.5 and for the slow 1.6. This difference is significant at the 5% level. The fast learners recalled 86% of the learned material on the first recall and 50% on the second recall test. The slow learners recalled 55% on the first recall test and 23% on the second. Thus, in this case, the fast learners retained a larger percentage than the slow group. The failure of the fast group to retain as large a percent on the first experience may have been due to the inability to contact all subjects for the retention test.

This preliminary study does show that fast learners retain more than slow learners following an equal number of overlearning

trials. It suggests that the superiority of the fast over the slow does not increase with time, however. Further study appears warranted by this preliminary investigation.

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