This Week's Citation Classic CC/NUMBER 36 SEPTEMBER 6, 1982

Peterson L R & Peterson M J. Short-term retention of individual verbal items. *J. Exp. Psychol.* **58**:193-8, 1959.
[Indiana University, Bloomington, IN]

Marked forgetting of a single syllable was found within seconds after one presentation. Forgetting progressed at differential rates depending on amount of controlled rehearsal. Short-term retention was indicated as a factor in the acquisition process. [The *Science Citation Index*® (*SCI*®) and the *Social Sciences Citation Index*® (*SSCI*®) indicate that this paper has been cited in over 625 publications since 1961.]

Lloyd R. Peterson
Department of Psychology
Indiana University
Bloomington, IN 47405

June 17, 1982

"My graduate research with rats involved the study of the effects of short delays between a tone and the delivery of food. Having become aware of the importance of brief intervals of time, when I turned as an assistant professor at Indiana University to do research on human memory, I was struck by its neglect of short retention intervals. Classical methods examined recall of a list of words many minutes or hours after learning. I suspected that forgetting must occur during the learning itself, as one forgets one word while thinking about others.

"My wife and I planned studies of forgetting of a single verbal item, and she carried them out. It was surprisingly difficult for a college student to remember three letters while counting backward for three to 18 seconds after one presentation. Time was required to retrieve an item much as in long-term memory. Contrary to a speculation that rehearsal merely postponed the onset of forgetting,[1] we found that the forgetting curve starting at the end of the last rehearsal had an asymptote dependent on the number of rehearsals. The evidence linked short-term retention with the acquisition process.

"An associate editor accepted our manuscript for publication with the proviso that several graphs be condensed into one table to save space. This eliminated the key graph showing differential forgetting as a function of rehearsal. Because tables are seldom studied, textbook authors tend to miss the heart of the article. Typically, they reproduce the figure showing a plunging retention curve after one presentation and ignore the effects of rehearsal. Even the description of the figure is often faulty in implying the curve represents all that could be recalled. Our article explained that the figure was limited to recalls having a latency less than the mean for all recalls, the objective being to fit a stimulus fluctuation model to the data. Total amount recalled was displayed cumulatively in another graph.

"Appreciation of the article's theoretical implications owes much to Arthur Melton, the senior editor, who discussed it in a well-known address to the American Association for the Advancement of Science.[2] Three factors appear to underlie its continuing citation. First, the experiments emphasized temporal process characteristics of short-term memory rather than traditional capacity limitations. Second, the article suggested a neglected theoretical relationship between short-term memory and learning. Third, it described a simple method for measuring short-term retention by which experimenters could readily explore the implications of the first two factors. Continuing controversy over a number of issues keeps the memory of the article alive."[3]

1. **Brown J.** Some tests of the decay theory of immediate memory. *Quart. J. Exp. Psychol.* **10**:12-21, 1958.
2. **Melton A W.** Implications of short-term memory for a general theory of memory. *J. Verb. Learn. Verb. Behav.* **2**:1-21, 1963.
3. **Lewis D J.** Psychobiology of active and inactive memory. *Psychol. Bull.* **86**:1054-83, 1979.