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This Week's Citation Classic™

Meyer D E & Schvaneveldt R W. Facilitation in recognizing pairs of words: evidence of a dependence between retrieval operations. *J. Exp. Psychol.* 90:227-34, 1971.
[Bell Laboratories, Murray Hill, NJ, and State University of New York, Stony Brook, NY]

An experimental technique was introduced to investigate the mental processes whereby people recognize printed words and retrieve their meanings from semantic memory. Results of the technique, which involved measuring subjects' reaction times, provided early support for currently popular 'spreading-activation' models of human information processing. [The *Science Citation Index*® (*SCI*®) and the *Social Sciences Citation Index*® (*SSCI*®) indicate that this paper has been cited in over 200 publications since 1971.]

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"Like other *Citation Classics*, our original article happened to come at the right time for having a significant impact. Experimental psychology had experienced a major paradigm shift during the 1960s, triggered by a confluence of new ideas from communications theory, computer science, and the formal study of language.[1] There was, in particular, a growing concern about the speed of mental processes and the mechanisms underlying human linguistic performance. Thus, the stage was already set for our research on word recognition.

"We each began participating in these developments as graduate students at the Universities of Michigan and Wisconsin. For example, our doctoral dissertations dealt, respectively, with semantic memory, (that is, the representation and retrieval of stored word meanings) and with choice reaction time.[2,3] However, the collaboration between us started rather unexpectedly.

"This chance event occurred at a meeting of the Psychonomic Society in San Antonio, Texas, during November 1970. There, one of us (DEM) presented a paper summarizing some of his new experiments on word recognition and reaction time that were conducted at Bell Laboratories.[4] Following the presentation, the other of us (RWS) came up and casually mentioned some related experiments that he was then conducting at the State University of New York, Stony Brook. It turned out that several studies in these two lines of investigation, although conceived independently, had very similar designs, results, and theoretical implications. We quickly hit it off professionally and personally and agreed to coauthor a joint report of our findings. The agreement led directly to the cited article. Upon receiving the article, David Grant, then-editor of the *Journal of Experimental Psychology*, accepted it without much question or fanfare.

"We continued working together for five more years before moving on to other positions. A number of additional papers were produced. These culminated in a 1976 *Science* article and a colloquium paper presented at a meeting of the American Association for the Advancement of Science.[5]

"There are probably several reasons for the impact that our work has had. It popularized a simple, yet informative, experimental technique for studying the temporal properties of mental processes in word recognition. The technique, called a 'lexical-decision' procedure, involved measuring how quickly people can decide whether rows of letters are English words or nonwords. We showed that such decisions are faster when one word (e.g., 'nurse') is preceded by another semantically related word (e.g., 'doctor'). The time course of this facilitation, and its interaction with other experimental factors such as the legibility of the stimuli, were easy to replicate and had important implications concerning the dynamics of information-processing mechanisms. Our experiments, therefore, paved the way for exploring various facets of memory organization and retrieval associated with semantic memory.

"Furthermore, our theorizing involved an intriguing metaphor drawn from neurophysiology. We hypothesized that word recognition can be characterized in terms of 'spreading activation' that flows through a complex network of nodes and branches. This hypothesis has since gained considerable favor among psychologists and other cognitive scientists, as evidenced by a current proliferation of spreading-activation models of human information processing."[6]

1. **Lachman R, Lachman J L & Butterfield E C.** *Cognitive psychology and information processing: an introduction.* Hillsdale, NJ: Erlbaum, 1979. 573 p.
2. **Meyer D E.** On the representation and retrieval of stored semantic information. *Cog. Psychol.* 1:242-99, 1970. (Cited 125 times.)
3. **Schvaneveldt R W.** Effects of complexity in simultaneous reaction-time tasks. *J. Exp. Psychol.* 81:289-96, 1969. (Cited 40 times.)
4. **Meyer D E & Ellis G B.** *Parallel processes in word recognition.* Unpublished paper presented to the Psychonomic Society. November 1970. San Antonio, TX.
5. **Meyer D E & Schvaneveldt R W.** Meaning, memory structure, and mental processes. *Science* 192:27-33, 1976. (Cited 40 times.)
6. **McClelland J L & Rumelhart D E.** An interactive-activation model of context effects in letter perception. Part 1. An account of basic findings. *Psychol. Rev.* 88:375-407, 1981.

