

This Week's Citation Classic

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Anderson J R & Bower G H. Human associative memory. Washington, DC: Winston & Sons, 1973. 524 p. [Yale Univ., New Haven, CT and Stanford Univ., Stanford, CA]

The book described an associative theory of human memory, embodied in a computer simulation that made a wide range of predictions about sentence memory and other verbal learning phenomena. The theory dealt successfully with organizational phenomena thought to disconfirm associative theories. [The *Science Citation Index*[®] (*SCI*[®]) and the *Social Sciences Citation Index*[™] (*SSCI*[™]) indicate that this book has been cited over 320 times since 1973.]

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"The book reflects the culmination of a four year collaborative relationship between myself and Cordon Bower. When I arrived at Stanford University as a graduate assistant to Cordon Bower, there was an ongoing research program concerned with organizational and imaginal factors in various memory tasks. As we tried to become precise, even quantitative, in fitting organizational theory to free recall data, its differences from associationistic models of free recall seemed to evaporate, frankly, because neither theory had been formulated with any real precision up to that time. It became clear that what was needed was a theory of memory that was both general and precise.

"The outcome of rather intensive ruminations and discussions was the theory for human associative memory (HAM) that was proposed in the book. This was first worked out in detail in a long 'dissertation proposal' in which I had several goals: To present an associative theory of sentence memory, to report evidence relevant to it, to relate the theory to the historical tradition of associationism, and to indicate how a few standard 'verbal learning' phenomena might be interpreted in terms of this approach.

That document formed the basic outline for the book. I wrote the language parser and question-answerer of HAM as LISP code. The proposal and computer simulation led to a productive set of discussions and experiments, many of which are scattered throughout the book.

"In the spring of 1972 the collaborative writing of the book began. Each day was filled with hours of fruitful discussions followed by our individual writing efforts. In these discussions we came to adopt characteristic roles — I as the proposer, interpreter, and defender of HAM, and Cordon Bower as the critic, provider of more problems, and the demander of greater generality. However, like most fruitful interchanges, ours were freewheeling, and we adopted various roles as the occasion demanded. The discussions and writing turned out to be both personally and intellectually the most gratifying moments of our collaboration.

"Since that time HAM has been subject to considerable experimentation and discussion. It has been found to be wrong on some points and controversial on others. I was bothered by the fact that HAM did not say much about how memories were used in thought. This led to the development of the ACT model¹ which has a production system for mental procedures which interfaced this procedural component with a memory model derived from HAM. Cordon Bower was bothered by the fact that HAM does not address the issues of how large bodies of text material are processed, how large knowledge structures are organized in memory, and how these large structures are used to interpret text. This led him to an interest in story comprehension, scripts and schemata, and reconstructive memory processes.²

"Still HAM is very much with us and has important influences on our thinking about these new problems. In HAM we find many concepts and analyses that we can use as foundations for our new endeavors. Shortly, a revised edition of the book will appear.³ This edition is an attempt to focus on those aspects of the HAM theory that still seem relevant for the 1980s."

1. **Anderson J R.** *Language, memory, and thought.* Hillsdale, NJ: Lawrence Erlbaum Associates, 1976. 546 p.
2. **Bower G H, Black J B & Turner T J.** Scripts in memory for text. *Cog. Psychol.* 11:177-220, 1979.
3. **Anderson J R & Bower G H.** *Human associative memory: revised edition.* Hillsdale, NJ: Lawrence Erlbaum Associates. In press, 1980.