

Skinner B F. *The behavior of organisms: an experimental analysis*.  
New York: Appleton-Century-Crofts, 1938. 457 p.  
[Department of Psychology, University of Minnesota, Minneapolis, MN]

In a number of chapters, including "A System of Behavior," "Conditioning and Extinction," "Periodic Reconditioning," "Some Functions of Stimuli," "The Differentiation of a Response," "Drive," and "Behavior and the Nervous System," I report research on laboratory white rats, covering a wide range of experimental conditions, differing from the work of I.P. Pavlov and J.B. Watson in two ways: (1) behavior is shown to be shaped and maintained by its "reinforcing" consequences rather than elicited as a conditioned or unconditioned response to stimuli, and (2) it is explained without reference to either mental or neurological events. Behaviorism is the philosophy of such a science. [The *SCI*® and *SSCI*® indicate that this book has been cited in over 2,640 publications.]

## From Behaviorism to Teaching Machines to Enjoying Old Age

B.F. Skinner  
Department of Psychology  
Harvard University  
Cambridge, MA 02138

November 9, 1989

This, my first book, reports experiments that I began as a graduate student, continued for two years as a National Research Council Fellow and for three years as a Junior Fellow in the Harvard Society of Fellows, and then with my colleague, W.H. Heron, during my first two years as a member of the Department of Psychology at the University of Minnesota. The chairman of the department, R.M. Elliott, was the editor of the Century Psychology Series, published by Appleton-Century-Crofts, and he accepted the manuscript. The series had already published Edward Tolman's *Purposive Behavior in Animals and Men* and had agreed to publish Clark Hull's *Principles of Behavior*. Neither was likely to make much money, and Elliott felt that he was asking the company to take on too many books of that kind. He pled with me to take out some of the 150 figures I felt I needed. The figures stayed in, but only because the chairman of the Society of Fellows offered a subsidy of \$500 to help pay the costs of publication.

I also agreed to forgo royalties on the first thousand copies, and I suspect that a thousand were all that were originally published. The war soon followed, and a few copies were sold afterwards only because my friend, Fred S. Keller, then teaching at Columbia, began to use the book as a text. I believe the plates had been thrown away, but a new printing was made in the early 1950s.

My critics were quick to point out that the "organisms" in my title was stretching things a bit, because I had used only one species—the standard laboratory white rat—but the great classical figures in the field at the time (Sherrington, Magnus, and Pavlov) had studied only a single species too. My book shows signs of my early interest in reflexes, sponsored by those three figures.

*The Behavior of Organisms* would have been classified at the time as "learning theory," but it was about many other behavioral processes as well. Nevertheless, my research was on the role of the consequences of behavior, and that was "learning." They were not, however, the consequences that lay ahead in a particular instance, as the goal or purpose of the behavior; they were the consequences that had followed behavior in the past. Certain kinds of consequences "reinforce" behavior in the sense of strengthening it or making it more likely to occur again. Important consequences proved to be contingent on behavior in many different ways and patterns. Stimuli came to control the probability of behavior when they have been present when reinforcing consequences occurred.

Edward L. Thorndike had anticipated what I called operant conditioning with his Law of Effect,<sup>1</sup> but the contingencies in his experiment were rather different, and they led to the notion of trial-and-error learning. In my research the organism was not necessarily trying to do anything, and it certainly learned by successes rather than failures or errors.

Near the end of the book, I said, "Let him extrapolate who will," but I was already thinking of applications, and it was not long before I put the principles in my book to use. Operant behavior is the "behavior" in behavior modification, but the term "modification" is unfortunate. Behavior is changed in many ways that cannot be easily called modification. The applications that followed the publication of *The Behavior of Organisms* included (1) animal training (in World War II, I trained pigeons to guide missiles! Two of my colleagues on that project went on to develop the dolphin performances seen in many sea-life parks), (2) teaching machines<sup>2</sup> and programmed instruction—they are widely used in industry at the present time and with the help of computers are coming at long last into schools and colleges, (3) behavior therapy,<sup>3</sup> (4) the management of autistic or otherwise seriously handicapped people, (5) solutions to management problems in industry, and (6) (from my own happy experience) the enjoyment of old age.<sup>4</sup>

1. Thorndike E L. *Animal intelligence: experimental studies*. New York: Macmillan, 1911. (Cited 300 times since 1945.)
2. Skinner B F. Teaching machines. *Sci. Amer.* 205:90-102, 1961. (Cited 20 times.)
3. ———. The operant side of behavior therapy. *J. Behav. Ther. Exp. Psychiat.* 19:171-9, 1988.
4. Skinner B F & Vaughan M E. *Enjoy old age*. New York: Norton, 1983. 157 p. (Cited 15 times.)