

**Rescorla R A & Solomon R L.** Two-process learning theory: relationships between Pavlovian conditioning and instrumental training. *Psychol. Rev.* **74**:151-83, 1967.

**This paper examines the historical development of, and the evidence for, the separation of Pavlovian conditioning and instrumental training. It suggests a paradigm for examining their interaction in generating behavior and details some predictions from various instances of this paradigm. [The *Science Citation Index*<sup>®</sup> (*SCI*<sup>®</sup>) and the *Social Sciences Citation Index*<sup>™</sup> (*SSCI*<sup>™</sup>) indicate that this paper was cited a total of 213 times in the period 1967-1977.]**

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February 1, 1978

"This paper grew out of the joining of a long-standing interest of the second author with some empirical results obtained by the first author. It was written while R.A. Rescorla was a graduate student in R.L. Solomon's laboratory. In many ways it reflects the thinking of many people who were active in that laboratory over a period of about 10 years.

"Since the 1930's there had gradually been emerging a widely accepted distinction between two kinds of associative learning in animals: Pavlovian conditioning resulting from the arrangement of a contingency between a signal and a reinforcer, and instrumental learning resulting from a contingency between the response and the reinforcer. This paper presented a review of the emergence of this distinction, and evaluated some of the evidence supporting it. It further presented a theory of how these two kinds of learning might interact in producing learned behavior. On that theory Pavlovian conditioning plays an important

role in the learning of motivations, which in turn govern the exhibition of instrumental, goal-directed behavior.

"Three of its principal contributions were the making explicit of a paradigm for the study of these interactions, the elaboration of various empirical consequences of those interactions, and an emphasis upon a modern view of the role of inhibition in Pavlovian conditioning. The paradigm involved the superimposition of stimuli given Pavlovian conditioning on ongoing instrumental behavior. That paradigm, although examined earlier, was largely unexploited and inexplicit. It turned out both to yield information about the interaction among learning processes and to provide a valuable tool for the study of Pavlovian conditioning itself. The view of Pavlovian conditioning espoused really represented in part a return to Pavlov's own views, from which American psychology had strayed.

"The principal reasons that this paper has been widely cited have to do with its codifying a modern version of a theory dependent upon two learning processes, its laying out of a wide variety of empirically testable predictions, and its foreshadowing a revolution about to come in our thinking about Pavlovian conditioning. In the first role it has seemed representative of a particular set of theories and is often cited in that context. In its second role it led to many empirical studies, not all of which yielded results favorable to the theory. Its third role has been somewhat preempted by subsequent papers.

"Our greatest personal satisfaction about the way in which this paper has been received stems from the comment of a teacher and friend, Francis Irwin. He found in this paper a reason for thinking that Pavlovian conditioning was not 'all spit and twitches' but actually governed important psychological processes."