

Rescorla R. A. Pavlovian conditioning and its proper control procedures.
Psychol. Rev. 74:71-80, 1967.
[University of Pennsylvania, Philadelphia, PA]

A novel conception of the conditions producing Pavlovian conditioning was proposed. The implications of this proposal for the choice of controls for nonassociative effects and for the notion of inhibition were discussed. [The *Science Citation Index*® (SCI®) and the *Social Sciences Citation Index*® (SSCI®) indicate that this paper has been cited in over 405 publications since 1967.]

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"This article was one of several which signaled a change which has taken place in thinking about Pavlovian conditioning in the last several decades. It suggested that the contingency between a conditioned stimulus (CS) and unconditioned stimulus (US), rather than their simple pairing (or contiguity), is responsible for their becoming associated. The notions of contingency and contiguity had not explicitly been separated in Pavlovian conditioning although they are conceptually quite distinct. An animal which is sensitive to contingencies evaluates not only the number of times the CS and US jointly occur but also the degree to which they occur separately from each other. Attention to the latter part of the CS/US relation makes the animal a much more sophisticated assessor of its experiences. It suggests a sensitivity to the degree to which the CS signals or provides information about the US rather than simply to their joint occurrences.

"The notion of contingency had two important consequences. First, it suggested a novel control procedure for

'nonassociative effects' in conditioning, the 'truly random control.' With that procedure, the CS and US occur independently of each other in time, resulting in a zero contingency. Second, it naturally generated a class of CS/US relations which had received little attention in American views of Pavlovian conditioning: inhibitory relations. In inhibitory relations, the contingency between the CS and US is *negative*. Consequently, this view helped encourage the exploration of a new set of CS/US relations.

"I think that this paper has proved influential both because it suggested a new theoretical view of conditioning which proved very heuristic and because it proposed some new methodology. Those interested in understanding the learning process theoretically were interested in the former aspect. But the fact that conditioning is broadly applied in the study of other psychological issues led others to be interested in the methodological features of the paper.

"Both the theoretical and methodological aspects of the paper have received more sophisticated treatment since the time of this paper. We now have available several quite successful theories of Pavlovian conditioning in the context of which this paper is better understood.¹

"My writing of this paper had quite a practical local impetus. I was in the process of writing my dissertation on Pavlovian fear conditioning, in which I described experiments which employed the truly random control procedure. I realized that there was a need to discuss the theoretical basis of using that novel control, but found the required lengthy discussion out of place in the dissertation itself. Consequently, I wrote this paper as a source to which I could refer. Of course, this paper has proved of much more inherent interest than has my dissertation."

1. Rescorla R A & Holland P C. Behavioral studies of associative learning in animals.
Annu. Rev. Psychol. 33:265-308, 1982.