

Renewal of responding following extinction of an instrumental response.

Travis P. Todd, Drina Vurbic, Neil E. Winterbauer, and Mark E. Bouton (University of Vermont).

Following the acquisition of an instrumental response (e.g., rats lever pressing for food) the probability of that response can be decreased by an extinction procedure (omission of reinforcement). Although extinction reduces the probability of a response, recovery effects show that the underlying association is *not* destroyed. One such recovery effect is renewal, which involves testing the animal outside the context of extinction. Renewal effects have been studied extensively in Pavlovian conditioning, but there are few studies in instrumental conditioning (e.g., Nakajima, Tanaka, Urushihara, & Imada, 2000).

Experiment 1a demonstrated ABA renewal of instrumental responding. Using a within-subjects procedure, one group of rats was trained to lever press for food in Context A. All rats received extinction training in Context B and were then tested in both contexts. The results showed an increase in responding when the rats were tested in Context A as opposed to when they were in Context B. Experiment 1b demonstrated AAB renewal using a similar procedure, differing only in that all rats were extinguished in the context of acquisition (A) and then tested in a different context (B). Once again, renewal of responding occurred, with more responses being made in Context B than in Context A. The strength of AAB renewal did not depend on the amount of extinction training (Experiment 2). Taken together, these results indicate that renewal of instrumental responding will occur upon return to the original context and upon removal from the extinction context.

Upon extinction of responding in Context B, rats were tested in both the context of extinction (B) and a novel context (C; Experiment 3). Once again, there was a clear increase in responding when testing occurred outside the context of extinction (ABC renewal). By using a procedure designed to reduce the excitatory strength of Context A, Experiment 4 showed that the robust effect of ABA renewal may depend in part on the overall excitatory strength of the acquisition context.

We have, for the first time, demonstrated AAB and ABC renewal of leverpressing in rats. Results provide a strong parallel with earlier work with Pavlovian conditioning and are discussed in terms of their theoretical and translational importance.