Altruism Is Rewarding

Abstract. *People will learn an instrumental conditioned response, the reward for which is the deliverance of another human being from suffering.*

A large part of human behavior is altruistic. It takes its most dramatic form in emergencies, warfare, and social movements, where group loyalties often take precedence over individual needs. A wealth of recent laboratory experiments on altruistic behavior clearly indicates that, under certain circumstances, people will help others who are in need, despite the absence of an externally administered reward for the altruistic person (*1*). We now find that people will actually learn an instrumental conditioned response, the sole reward for which is to deliver another human being from suffering. We also find a profound similarity between the action of altruistic and conventional, nonaltruistic rewards: not only can learning be based on altruistic reward, but two standard parameters of reward, delay of reward and partial reward, show the same effects with both.

Psychologists call the experimental paradigm in which a subject learns to terminate a noxious stimulus "instrumental escape conditioning"; the action that terminates the noxious stimulation on each trial is an "instrumental response." The subject learns to make this response upon presentation of a cue which is called a "conditioned stimulus," and the rewarding termination of the noxious stimulation is "negative reinforcement" (*2*). Whereas the typical noxious stimulus is electric shock or continuous loud noise, our noxious stimulus was the simulated suffering of another human being. The reward was the cessation of the other person's suffering. Pushing a button was the instrumental response, and the conditioned stimulus was the onset of a signal light. We used a deception to mask the learning task so that the conditioning process would not be overridden by the subjects' normal use of their higher mental processes (*3*).

The subject and a confederate of the experimenter participated in an experiment that supposedly evaluated performance under stress. The confederate pretended to suffer as he ostensibly received continuous, painful electric shock while trying to hold a metal stylus steady in a tunnel. Whenever the stylus touched the edges of the tunnel, a counter clicked and showed the duration of the contact. The subject's task was to observe the confederate and to evaluate his performance. Both the conditioned stimulus and the instrumental response were concealed within this "evaluation" task. Upon presentation of an "evaluation signal," the subject set three dials, each of which evaluated the confederate's performance on one of three criteria. Of course, such evaluations are far too complex to be used as the response to be conditioned; they were merely part of the deception. After the subject set the evaluation dials, he received a "record signal" (the conditioned stimulus) and pressed the "record button" (the instrumental response) in order to activate the apparatus and record the three evaluations on magnetic tape. The altruistic reinforcement immediately followed the instrumental response of button-pushing: the shock went off, and the confederate breathed a sigh of relief as he received a 10-second break from his stressful task. An electric timer automatically measured the latency of the button-pushing response, beginning with the presentation of the conditioned stimulus (record signal). After the break, a new trial began.

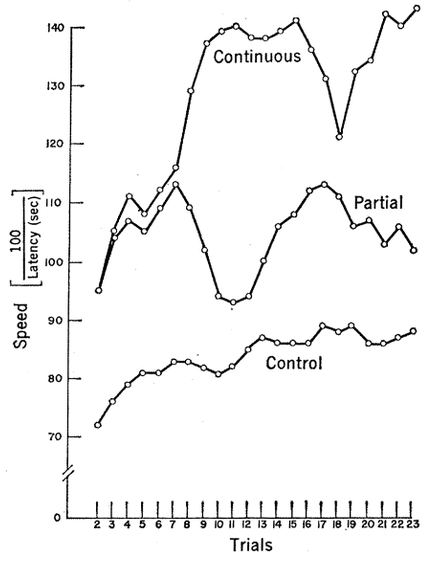

Fig. 1. Acquisition curves of response speed under partial and continuous altruistic reinforcement. Each point represents the mean of the speeds (in reciprocal seconds) of three trials with the number of the middle trial in each set of three given on the abscissa.

The purpose of experiment 1 was to determine whether the cessation of the other person's suffering (altruistic reward) would have the same functional characteristics as the conventional rewards of escape conditioning. Typically, in escape conditioning the speed of the instrumental response increases over the course of trials, approaching an asymptote (learning); and response speeds during learning and at asymptote are faster when the reward is given on every trial (continuous reinforcement) than when the reward is given on only half the trials (partial reinforcement) (*4*).

There were two experimental groups (one with continuous and one with partial altruistic reinforcement) and two control groups, with 24 undergraduate subjects in each group ($N = 96$). There were three male and three female confederates, completely counterbalanced so that each ran four subjects of his own sex in each group. Four random orders of partial reinforcement were used, counterbalanced for confederate. As usual in escape conditioning, response speed increased over trials in the experimental groups, and, after several acquisition trials, the group with continuous reinforcement clearly outperformed the group with partial reinforcement (Fig. 1). Learning effects (improvement over trials) were significant when tested by analysis of variance over the first 7 of the 24 trials for both the partial ($F = 2.74$; d.f. $= 6, 138$; $P < .025$) and the continuous ($F = 2.22$; d.f. $= 6, 138$; $P < .05$) groups. The continuous were significantly faster than the partial on a block of the last 15 trials ($F = 5.15$; d.f. $= 1, 44$; $P < .025$).

In order that the interpretation of the results be entirely unambiguous, it seemed desirable to control for three possibilities. First, the instrumental response could improve over trials because the confederate's rest break was also a rest period for the subject and might have been rewarding for that reason alone. Second, the instrumental response could improve over trials simply on the basis of practice. These first two possibilities were eliminated by a continuous-control and a partial-control group, each of which was treated exactly as its experimental counterpart was, except that in the control conditions the confederate did not

"receive" electric shock. Since the continuous-control group received the rest break on all trials and the partial-control group on only half the trials, *both* improvement over trials *and* a partial reinforcement effect should have been obtained if the rest break were rewarding in itself. However, no such partial reinforcement effect was obtained, although there was a practice effect, as indicated by the fact that the controls showed a small but steady improvement over trials. While this improvement is of marginal significance when tested separately, the combined controls, with $N = 48$, show that the effect is significant ($F = 2.70$; d.f. = 6, 282; $P < .025$). It was therefore necessary to demonstrate unequivocally that the continuous and partial experimental groups were superior to their respective controls (continuous: $F = 7.69$; d.f. = 1, 44; $P < .01$; partial: $F = 8.34$; d.f. = 1, 44; $P < .01$).

A third possibility to be controlled was that the difference between experimental and control groups might be solely due to the energizing effects of vicarious drive (*5*) or of the tension induced by the "suffering" of the confederate and accumulated over trials to produce the semblance of a learning curve. This possibility was eliminated by the significant superiority of continuous to partial reinforcement in the experimental groups. Since the partial group, like the continuous group, received vicarious shock on every trial, it would have had to perform, in terms of accumulated tension alone, at least as well as the continuous group. In fact, since the partial group had rest periods on only 50 percent of the trials, it may have had to perform better than the continuous group. Having thus eliminated the alternatives, the appropriate conclusion is that the acquisition and partial altruistic reinforcement effects obtained are directly analogous to reinforcement effects in conditioning.

In escape conditioning, instrumental response speed is faster when the reward is presented immediately after the response than it is when presentation of the reward is delayed (*6*). The purpose of experiment 2 was to determine whether cessation of the other person's suffering would also exhibit this fundamental property of rewards. There were two experimental groups, one with no delay and one with a 5-second delay of altruistic reinforcement ($N = 48$). Procedure followed experiment 1. On a block of the last 15 trials, speed was significantly faster for immediate reinforcement than for delayed reinforcement ($F = 13.64$; d.f. = 1, 44; $P < .001$), as in conditioning.

In both experiments, all asymptotic comparisons between groups were factorialized for sex of subject and confederate (within each group, subject and confederate were the same sex). In no comparison was there a trace of a main or interactive effect of sex.

Classical political philosophers, such as Hobbes, Locke, Rousseau, and Comte, as well as their modern descendants, have found it essential to address themselves to the problems of selfishness and altruism in human nature. Ample psychological evidence is available to indicate that man is neither wholly selfish nor wholly altruistic in his behavior. It has not previously been demonstrated, however, that the roots of altruistic behavior are so deep that people not only help others, but find it rewarding as well. Much interest has been shown in the question of how socially constructive or altruistic instrumental behavior can be learned and maintained through extrinsic rewards. However, our research demonstrates that instrumental behavior can be learned and maintained solely through the rewarding function of altruism. The results further indicate that there is a profound similarity between the action of altruistic and conventional, nonaltruistic rewards: not only can learning be based on altruistic reward, but two standard parameters of reward, delay of reward and partial reward, show the same effects with both. Our results are compatible with several existing views of altruistic behavior and may be viewed as a necessary implication of some of them.

If innate altruistic drives motivate people, as Campbell (*7*) has suggested, then drive reduction should reinforce them. If, during the course of childhood socialization, secondary reinforcement is conditioned to the cues of another person's relief from distress, as Aronfreed (*8*) has proposed, then these cues should be reinforcing to normal adults. If anticipatory guilt motivates people, then guilt reduction should reinforce them (*9*). If a person is motivated to adhere to the norm of social responsibility, as Berkowitz (*10*) has proposed, then knowledge of the results of successful adherence should reinforce him, as should a reduction of the fear of social sanctions for transgressing the norm (*11*).

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References and Notes

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