

THE EFFECTS OF A CHANGE IN REWARD PROBABILITY ON  
PREFERENCE FOLLOWING AUTOSHAPING WITH TWO-SIGNAL  
SEQUENCES: AN EXTENSION OF THE EGGER AND MILLER  
INFORMATION HYPOTHESIS

by

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B.A., CENTRAL STATE UNIVERSITY, 1969

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A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Psychology

KANSAS STATE UNIVERSITY  
Manhattan, Kansas

1974

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## INTRODUCTION

Egger and Miller (1962) hypothesized that if a reinforcing stimulus is made contingent on a sequence of two signals the more informative signal in the sequence will become the more effective conditioned reinforcer. They first trained two groups of rats to press a bar for a food pellet. After several training sessions the bar was removed from the chamber and Pavlovian conditioning was given. For one group a "free" pellet was contingent on a sequence of two signals, S1 and S2, presented 2 sec and 1.5 sec prior to each pellet delivery. S1 presentation overlapped S2 presentation and both terminated shortly after pellet delivery. For this group S1 was an informative signal and S2 was a redundant signal. The other group received the same S1-S2-food sequences and also received S1 alone randomly interspersed with the regular sequences. When S1 was presented alone food never followed which made S1 an unreliable predictor of food delivery. Tests of the conditioned reinforcing effect of S1 and S2 followed the Pavlovian conditioning. At the start of the test session the bar was reinserted into the chamber and the rats were allowed to press for food; then the barpress was partially extinguished by withholding food for 10 min while the rats continued to press; and finally conditions were changed so that either S1 or S2 was contingent on a barpress. In the first test session half the subjects in each group were presented S1 following every third barpress while the others received S2. In the second test session the contingencies were reversed. The group for which S1 had been a reliable predictor during conditioning showed more recovery of barpressing if S1 were contingent

on the barpress than if S2 were. For this group S1 apparently was a more effective conditioned reinforcer. The group for which S1 was an unreliable predictor during conditioning showed greater recovery of barpressing when S2 was contingent on the barpress than when S1 was.

Egger and Miller argued that when S1 and S2 were both reliable predictors of food S1 became a more effective conditioned reinforcer because S2 provided only redundant information about the probability of food delivery. When S1 was an unreliable predictor S2 signalled an increase in probability of food delivery and became a more effective conditioned reinforcer than S1.

The information hypothesis of conditioned reinforcement proposed by Egger and Miller is interpreted in this paper as implying that the reinforcing effect of a signal depends on whether or not the signal indicates an increase in reward probability. Signals in a sequence which indicate an increase in reward probability should be effective conditioned reinforcers and strengthen the response on which they are contingent. Signals which indicate no change in reward probability, i.e., are redundant, should not be effective conditioned reinforcers. Egger and Miller pointed out however that under some conditions their information hypothesis would not hold up. A signal immediately preceding reward which is made redundant by another signal occurring hours before should be a more effective conditioned reinforcer because of its greater temporal proximity to reward.

But what happens to a signal in a sequence which indicates a decrease in reward probability? Interpretations of conditioned reinforcement which stress that information is intrinsically reinforcing (Berlyne, 1957; Hendry, 1969; Schaub, 1969) imply that a signal which