

INFLUENCE OF PATTERNS AND PERCENTAGES OF REINFORCEMENT ON RESISTANCE TO EXTINCTION¹

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Using a modification of Humphrey's (1939) verbal-expectancy procedure, Grosslight, Hall, and Murnin (1953) found greater resistance to extinction when Ss received a pattern of reinforcement in which the last trial on each of five acquisition blocks was reinforced (UR) as contrasted with a pattern in which the last trial of each block was nonreinforced (RU). In Lewis' (1960) recent review of the partial reinforcement effect he suggests that the patterning variable be studied in combination with other variables. The present study sought to determine whether an interaction existed between the patterning and percentage variables as measured by resistance to extinction.

Method.—Two conditions of patterning (UR and RU) and two percentages of reinforcement (25% and 75%) were presented in a 2×2 factorial design. Training was divided into four successive acquisition blocks consisting of 10, 7, 7, and 12 trials and an extinction block consisting of 20 trials. Trial-patterning was similar to that used by Grosslight, *et al.* (1953), i.e., each acquisition block began with a reinforced trial and the extinction block began with two reinforced trials. Thirty-nine students of both sexes from elementary psychology classes were randomly assigned to the four conditions. Ss were seated in a dimly lit room. They faced a modified Humphrey's board which consisted of two 60-w frosted bulbs, 19 in. apart. Ss' task was to indicate on a piece of paper whether or not they expected a flash from the Right lamp to follow a flash from the Left lamp. Stimulus flashes lasted .5 sec. with a 3-sec. interval between flashes. The lights were programmed by a punched tape and a two-channel electrical switch system. The tape rotated on a sprocket driven by a 4-rpm synchronous motor.

Following the last trial of each block E announced the end of the trial-series. After a 20-sec. pause E announced the beginning of the next series.

Results and discussion.—The main results are shown in Table 1. Analysis of variance indicated a significant interaction ($F = 4.26$; $df = 1/35$; $P < .05$) between patterns and percentages of reinforcement. The results shown in Table 1 agree with the findings of Grosslight, *et al.* (1953); at a moderately high percentage the UR pattern yields significantly greater resistance to extinction than the RU pattern ($t = 2.96$; $df = 16$; $P < .01$). On the other hand, the

¹The data were collected and processed while the author was a graduate student at Florida State University. However, this paper was written while the author was on a National Science Foundation Postdoctoral Fellowship.

TABLE 1
MEAN NUMBER OF LIGHT EXPECTANCIES DURING THE EXTINCTION PERIOD

Condition	N	Mean	SD
75% UR	9	7.44	2.51
75% RU	9	4.44	1.74
25% UR	10	7.00	3.02
25% RU	11	7.73	4.38

results clearly show no differential patterning influence on resistance to extinction under a moderately low percentage. Furthermore, it should be noted that greater resistance to extinction was found under conditions of a 25% RU reinforcement pattern than under conditions of a 75% RU reinforcement pattern ($t = 2.28$; $df = 18$; $P < .05$). This result is consistent with the findings of Grant, Hake, and Hornseth (1951).

The present results indicate that in a verbal-expectancy task the influence of patterning on resistance to extinction depends on the percentage of reinforcement. Presumably a percentage which itself yields strong resistance to extinction, e.g., 25%, effectively eliminates the influence of the patterning variable.

Summary.—Thirty-nine Ss served in a verbal-expectancy task. The results revealed that the effects of patterning (reinforcement or nonreinforcement termination) and reinforcement percentages (75% or 25%) interact during extinction. There was a greater resistance to extinction with reinforcement termination, but only under the 75% condition.

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