Resource location and reinforcement reversal

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Abstract

Resource location was shown effective with 70% reinforcement feedback. However, resource location in pairs of Ss broke down when the reinforcement feedback was reversed such that the favored S now became nonfavored, and vice versa. This is empirical support for a theoretical position relating to the difficulty of groups to engage in effective resource location under changed environment conditions if the groups decrease their potential for handling changes.

Introduction

Stogdill (1959, p. 285) has said, "The survival of a group may depend upon the manner in which it responds to the demand for change." Banta & Nelson (1964) concur, and point out that it seems likely that a group which becomes very efficient in a particular kind of reward structure may have difficulty dealing with situations which demand change. They add that this is a theoretical position which remains to be tested empirically.

The present study is concerned with such an empirical test in the area of resource location, which is "...the group process of finding out who has the best ideas in the solution of a problem." (Banta & Horowitz, 1964). In this experiment one S was favored over another with 70% reinforcement. Then, after a series of trials, the other S was favored with the same amount of reinforcement. The problem was whether pairs of Ss could develop social interaction such that one S, the favored one, could become dominant. Second, if this could be done, could the groups switch dominance when the non-favored S became the favored one?

Method

Twenty student nurses were randomly assigned to 10 pairs. Each pair was told it was participating in an Extra Sensory Perception study, and that their task would be to guess the pronoun with which another person had begun each of 30 sentences. The pronouns "I," "We," "He," "She," and "They" were on five cards respectively, which were placed before the pairs of Ss in random order. There were 30 cards of 3 x 5 in, with incomplete sentences typed on them. The sentences were ordinary statements, with the first word missing, e. g., "——sometimes drove too fast."

E sat behind the pairs and told them to choose one of the five pronouns to begin each sentence. The Ss were instructed to hold up the pronoun card chosen so that E could see it. Of the 30 choices, the first 10 were used as a base rate. In trials 11-20 E said "right" with a probability of .7 if the favored S chose the pronoun, and "wrong" if the unfavored S chose the pronoun. This is known as a 70%-0% schedule, and was independent of which pronoun was chosen. As in the Banta & Nelson (1964) study, the person who first suggested the chosen pronoun was considered to have gotten her opinion adopted. For trials 21-30 the same procedure was applied, except a reversal was now necessary, since the favored S became the nonfavored S, and vice versa.

Results

Table 1 reveals the performance of the Ss in blocks of 10 trials. It can be seen that during the first 10 trials in which there was no reinforcement, the Ss responded on a chance basis. However, in the second block of 10 trials the 70%-0% schedule was highly effective in getting the favored S to dominate. Resource location had occurred, with one S making the vast majority of the decisions, namely the favored S. However, resource location broke down when the environment changed. With the nonfavored S becoming favored, and vice versa, the Ss responded in much the same way as they had in the middle block of trials. Such responding was now wrong, as determined by E, but the feedback was ineffective in altering the response pattern set up by the reinforcement to the S who was initially favored.

Discussion

The results support the theoretical position of Stogdill (1959) and Banta & Nelson (1964) that change in the reward structure can decrease the effectiveness of a group's resource location. This was true even though E provided feedback to Ss. In the everyday functioning of a group it could not always depend upon the environment to provide such feedback. Thus, change in the environment may have disastrous effect upon a group unless it is able to meet the demand for change.

Banta & Nelson (1964) used 60 trials, but found that the probability of the favored S getting her opinion adopted did not significantly increase after the first block of reinforced trials (11-20). They attribute this as likely stemming from at least two sources: (1) cognitive factors, since Ss seem to grasp swiftly that one is better than the other, and reinforce the favored-

Table 1. Number of Pronouns Chosen by Favored and Nonfavored Ss

	Blocks of Ten Trials		
	1	2	3
Decision by S Favored in Second Block	11	16	14
Decision by S Not Favored in Second Block	9	4	6
Binomial p	ns	.006	.058

nonfavored relationship, making for sharp changes early in the experiment; (2) a group centered approach ("we got it right") rather than an ego centered perception ("I got it right") which would lessen the effect of E's reinforcement in the later trials. While these explanations remain speculative, the present experiment again demonstrated that Ss can rapidly engage in resource location as a result of feedback from E. Ss failed in resource location when the reinforcement feedback was contingent upon choice of the pronoun by the formerly nonfavored S.

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Note

1. I wish to acknowledge my thanks to Thomas J. Banta for supplying me with information relevant to the present study.

(Cont.)

runway) which does not show forgetting and tend to minimize the other measure (terminal speed) which does. Since they only report speed after S had already left the starting box, no starting latencies are available. This is unfortunate, since Gleitman and Steinman's results suggest that this last measure, latency, is the most sensitive to retention loss. Since starting latencies were not reported and since forgetting was in fact obtained for terminal speeds, Ehrenfreund and Allen's results can hardly be taken as a demonstration that runway performance is not forgotten.

(3) Several other studies have shown that forgetting in rats may be manifested not only by an increase but also by a decrease in response strength, if what was originally learned was a suppression of a response. Thus, for example, rats forget not to press immediately after reinforcement in a fixed-interval schedule if tested after an interval of about a month (Gleitman & Bernheim, 1963). In similar manner, they will fail to show the usual depression effect when shifted from a high to a low reward magnitude if the shift occurs after a two-month interval (Gleitman & Steinman, 1964). Such findings indicate that we are indeed dealing with forgetting rather than a motivational change.

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Reply

Under certain conditions, runway performance in the white rat shows a decrement after an extended retention interval. Forgetting is either a name for such a loss or an expression of ignorance. Part of our research program is concerned with the discovery and manipulation of some of the relevant variables. The Gleitman & Steinman study (1963) was used as a point of departure partly because it was one of the best controlled to date and partly because it provided a concrete rather than hypothetical situation for purposes of theoretical analysis.

Our conclusions regarding their study did not result from our data as they imply. Our conclusions stemmed from our theoretical analysis and our study was in test of that analysis. As for the procedural differences of practice and length of interval, these variables have not been systematically tested in the runway situation so that we just don't know what their effect is. The 27-day interval of our study should certainly be long enough. On the other hand, too long a retention interval may result in changes in joints and muscle tone that could certainly effect the first few trials of retention of running speeds. For that matter, our terminal speed decrement, which fully recovered in five trials, looks as much like warm-up as forgetting in the classical sense. So do the running times reported by Gleitman and Steinman which fully recovered in four trials after a 64-day interval.

We emphasize the running response (middle 2 ft) simply because it is extremely reliable and stable. Curves for single Ss are indistinguishable from those for group means. Considering this stability and length of asymptote, a control group would have been redundant.

The data for the terminal speeds were not pursued because for the moment they have less scientific interest for us, being merely another in a series of demonstrations showing a loss. The running speeds, however, since they showed perfect retention, offer a better opportunity to test the implications of our theoretical suggestions about the role of the r_g-s_g mechanism in studies of retention of instrumental running. Thus a series of studies were instituted in which both number of practice trials and cues related to elicitation of r_g during the interval are being varied. Our initial data are as predicted. During the retention interval, we introduced extra-alley cues (e.g., daily handling and placing in retention cages) similar to cues preceding alley runs during acquisition and designed to elicit and thus presumably extinguish r_g. The retention decrement was not only significant, but more pervasive than anything yet reported despite the fact that we employed 60 practice trials and a 27-day interval,—"the expected effect of which (according to Gleitman and Steinman) is clearly to reduce retention loss." This suggests that size of interval may be less important than what Ss do during the interval; a statement which is certainly not original.

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