Locus of control and the effectiveness of direct and vicarious reinforcement*

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It was hypothesized that the effectiveness of vicarious reinforcement would be attenuated for internal Ss by the addition of direct reinforcement. Ss classified as internals or externals using Rotter's I-E scale participated in a two-alternative discrimination problem in which vicarious reinforcement always indicated the correct alternative. The results showed that vicarious reinforcement alone was equally effective for internals and externals but that vicarious reinforcement was less effective for internals than externals when direct reinforcement was also presented.

Several studies which compared the effects of vicarious reinforcement with the effects of the combination of direct and vicarious reinforcement found that vicarious reinforcement alone was as effective as the combined reinforcement procedure (e.g., Bandura & McDonald, 1963; Kanfer & Marston, 1963). While at first these results may seem surprising, a plausible explanation can be found if one considers the informational aspect of reinforcement. According to this view, one function that direct reinforcement and vicarious reinforcement have in common is that both can provide information about appropriate behavior. Cairns (1967) has made this point with regard to direct social reinforcement, and similar interpretations have been presented to account for vicarious reinforcement effects (e.g., Bandura, 1970; Kanfer, 1965; Flanders, 1968). Therefore, if vicarious reinforcement alone provides the necessary information regarding appropriate action, the combination of direct and vicarious reinforcement is redundant and not likely to produce any changes beyond those that were achieved with either vicarious or direct reinforcement alone.

While investigations of vicarious reinforcement and direct and vicarious reinforcement have tended to be concerned with the efficacy of these social influence procedures, some studies have reported that Ss may resist imitating attempts at social influence (e.g., Luchins, 1944; Kanareff & Lanzetta, 1958; Schein, 1954). It has been suggested that Ss

may resist being influenced by a model because they think that they should act independently. There is ample evidence in the conformity literature and the attitude change literature which indicates that Ss do not always accept the information provided by others. While there are many factors which may account for an S's resistance to imitation, one factor which has not been explored is the S's generalized expectancy for internal vs external control of reinforcement (i.e., locus of control).

Persons with a generalized expectancy for internal control of reinforcement (internals) tend to believe that they receive reinforcement as a consequence of their own skills and abilities. Persons with a generalized expectancy for external control of reinforcement (externals) tend to believe that their reinforcements are controlled by forces external to themselves, such as chance, luck, or fate.

The focus of this experiment was to examine the relationship between the effects of direct and vicarious reinforcement and generalized expectancies regarding internal vs external control of reinforcement. In an observational learning situation involving reinforcement to a model, task-relevant cues are provided by the model's behavior and the associated reinforcements. When only vicarious reinforcement is used, the model's behavior is the major source of information for the S regarding the solution of the task. When both direct and vicarious reinforcement are employed, the S has two major sources of information about the solution to the task—vicarious reinforcement and the direct reinforcement of the S's behavior. The S may rely upon either or both sources of information. Because internals seem to place greater value on personal achievement (Rotter, 1966) or because they "... have stronger feelings of competence and, hence tend to rely on

their own resources [Julian & Katz, 1968, p. 94]," it was hypothesized that when both direct and vicarious reinforcement were available, internals would be more prone than externals to rely upon direct reinforcement and to ignore the information provided by vicarious reinforcement. In this way, internals could solve the task on their own. However, when direct reinforcement was not available, it was hypothesized that both internals and externals would utilize the information provided by vicarious reinforcement, since this was the only source of information available for solving the task.

METHOD

Sixty-four Ss representing the upper and lower quartiles of scores on the Rotter I-E scale (Rotter, 1966) were selected from a total sample of 130 Ss recruited from the introductory psychology courses at Indiana University. The scores for internals ranged from 1 to 8, and the scores for externals ranged from 13 to 19.

The Ss arrived at the experimental room and were tested in groups of nine. Each S completed Rotter's I-E scale. As they finished the questionnaire, Ss were paired together and directed to one of two rooms. The E in each of the rooms had no knowledge of the Ss' scores. The procedure was the same for both Es. The Ss were seated side by side, about 6 ft apart, facing the E. Depending upon which seat the S chose, he determined whether he would play the role of a model or an observer, although he was not informed of his role in the experiment. The E read the standard instructions which stated that the study was concerned with social communication through gestures. The E would present a series of six different hand signals from the manual alphabet for the deaf. The Ss were to watch the series and then respond with one of two hand signals (hereafter referred to as A and B). The E demonstrated each signal and had the Ss practice them. If the S thought that a particular series belonged to one category, he was to give one of the signals (e.g., A); if he thought it belonged to the other category, he was to give the other signal (e.g., B). The categories were not specified. Actually, the E had no categories in mind, and the series of signals he produced had no systematic characteristics. The task, therefore, was insoluble.

Both Ss were to respond to the same series of signals presented by the E on each trial. Pairs of Ss were assigned alternately to one of two conditions. In the vicarious reinforcement condition, the model was told whether his signal response

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was "right" or "wrong" immediately following his response, but the S was told that he would not be informed about the correctness of his response. In the direct and vicarious reinforcement condition, both the model and the S were informed as to whether their responses were "right" or "wrong" immediately after each responded on each trial.

The E determined in advance when the model would be correct. This occurred on 4 of the 10 trials used in the experiment.¹ The predetermined order of "rights" and "wrongs" was the same for all Ss.

The S was faced with a simple two-choice discrimination. On each trial, he was to respond with one of two hand signals. On each trial, the model responded first and was told whether his response was correct or not (vicarious reinforcement). Thus, the S could give the correct response on every trial by giving the same response as the model when the model was "right" or by giving the opposite response when the model was "wrong."

Since pilot testing revealed no sex differences in utilization of the information provided by the model's behavior and no differential reactions to the sex of the model, no attempt was made to select systematically an equal number of males and females or to use like-sex pairs.

RESULTS AND DISCUSSION

The effects of the reinforcement conditions (vicarious vs direct and vicarious), I-E control (internals vs externals), and Es were examined by analysis of variance based upon a 2 by 2 by 2 factorial design. The dependent measure for each S was the total number of correct responses over the 10 trials. No statistically reliable differences were found for the main effects; only the Reinforcement by I-E Control interaction was significant

Table 1
Mean Number of Correct Responses for
Internals and Externals as a Function of
Conditions of Reinforcement

Reinforcement	Internals	Externals
Vicarious	7.94 _a	7.44 _a
Direct and Vicarious	5.94	7.62 _a

Note—Means having the same subscript do not differ significantly from each other; the mean without a subscript differs significantly from each of the other means with $\alpha = .05$, Duncan's multiple-range test.

($F = 4.47$, $df = 1/56$, $p < .05$). The four means involved in this interaction are reported in Table 1. A comparison of these means by Duncan's multiple-range test shows that internals in the direct and vicarious condition gave fewer correct responses than Ss in each of the other conditions. No reliable differences were found between the other conditions. Therefore, vicarious reinforcement alone was equally effective for internals and externals, but the combination of direct and vicarious reinforcement was less effective for internals than for externals, the internals performing just slightly above chance level. The hypothesis which prompted this study is clearly supported by these findings.

Several studies have shown that vicarious reinforcement can be more effective than direct reinforcement alone (e.g., Bandura & McDonald, 1963; Berger, 1961; Kanfer & Marston, 1963). This investigation demonstrates that the efficacy of vicarious reinforcement can be attenuated by combining it with direct reinforcement for Ss who are characterized as having a generalized expectancy for internal control of reinforcement.

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NOTE

1. Although it was intended that the model be correct on half of the trials, an error in making up the procedural instructions to the Es added an incorrect trial where a correct one was intended.