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VICARIOUS REINFORCEMENT: EXPECTED AND UNEXPECTED EFFECTS

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The primary purpose of this study was to examine the effects on one child of observing another child receive direct social reinforcement. In the first part of the study, pairs of same-sex children worked on puzzles for three sessions spaced 2 to 3 days apart. One child was praised on a continuous schedule for performance, whereas the other received no praise. Although children who observed other children being praised increased their performance initially (as predicted by vicarious reinforcement and social comparison hypotheses), their performance decreased over time, reaching levels below their own baseline rates. In the second part of the study, intermittent praise delivered to the observing child was examined as a potential strategy to reverse the unexpected effects obtained in the first part of the study. Intermittent praise was found to be effective in reducing these effects and in producing enhanced performance. Individual data, as well as group data, are presented. Results are discussed in light of theoretical and applied issues related to the use of vicarious reinforcement in applied settings.

DESCRIPTORS: vicarious reinforcement, observed reinforcement, children

Several studies have shown that performance under vicarious reinforcement conditions is similar to that under direct reinforcement conditions (cf. Bandura, 1971). That is, similar schedules of vicarious and direct reinforcement produce comparable effects on behavior, both during acquisition and during extinction. Such findings are of both theoretical interest and applied importance. In that learning occurs in the absence of direct reinforcement, it becomes possible to produce behavior change in applied settings by engineering opportunities for individuals to observe others receive reinforcement. As suggested by Kazdin (1979), the delivery of direct consequences to specific individuals could be arranged in such a way as to provide maximal information to the observers about the desired behaviors, the available consequences, and the times at which those consequences are available. The utility of vicarious reinforcement in producing behavior change in applied settings has already been explored for prosocial behavior, attentive classroom behavior, and improved classroom deportment (e.g., Christy, 1975; Drabman & Lahey, 1974; Kazdin, 1973).

However, the effects of observing another individual receive reinforcement are not always consistent with those predicted by vicarious reinforcement hypotheses. For example, Sechrest (1963) arranged for pairs of children to work simultaneously on tasks of equal difficulty. Following task performance, Sechrest selected only one of the children to receive reinforcement, even though both children performed at comparable levels. On a subsequent task, he found that the performance of the reinforced child improved, whereas that of the observing child did not. Sechrest speculated that the observing child was being "implicitly" punished, since he

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or she had performed similarly to the reinforced child but had not received direct reinforcement.

Recently, we affirmed Sechrest's findings in both normal and severely disturbed children (Ollendick, Shapiro, & Barrett, 1982). In our study, pairs of normal or psychiatrically impaired children worked on tasks under conditions similar to those of Sechrest. One child in each pair received reinforcement and the other did not. The results were unambiguous for both types of children: Although observing another child receive reinforcement initially served to increase performance, such effects were short-lived. Further, negative and aggressive behaviors were evidenced in the observing children, suggesting that these children were responding as if they had been punished. Subsequent to this study, we examined sex and age as moderator variables which might affect this phenomenon in normal children (Ollendick & Shapiro, in press). In this second study, we found that the negative effects of observing another child receive reinforcement were more pronounced for boys than for girls and for older than for younger children.

In examining Sechrest's unexpected findings, Bandura (1971) noted that a clearer distinction should be made between "implicit reinforcement," the phenomenon examined by Sechrest (1963), and vicarious reinforcement. In vicarious reinforcement, typically, observers do not make any responses during the influence period and, therefore, the extent of reinforcement delivered to the model has no direct personal consequence for the observer. In implicit reinforcement, by contrast, individuals make similar responses that are explicitly reinforced in one member and implicitly punished in the other. When the same level of performance is reinforced in one child and implicitly punished in the other, the nonreinforced child is not only exposed to observed outcomes, but also to direct consequences for his or her own performance. Under such conditions, direct consequences prevail over vicarious ones, and performance of the nonreinforced child worsens.

In the Ollendick and Shapiro study (in press), we examined Sechrest's implicit punishment hypothesis, along with social comparison hypotheses, to account for the more debilitating effects observed in boys than in girls and in older than in younger children. The social comparison literature suggests that assessing one's own skills and abilities by comparing one's performance to that of others is more characteristic of boys and that such comparisons increase with age (e.g., Ruple, Parsons, & Ross, 1976). This social comparison notion has received concerted attention of late, most notably in the work of Seta (1982). Briefly, Seta has shown that reinforcement delivered to a targeted individual serves as a cue for evaluation or comparison in the observing individual, and that this cue in turn serves as a source of arousal. This hypothesis would predict, at least on early trials, that the observing child would expend concerted effort and match the performance of the directly reinforced child, a prediction similar to that offered by Bandura. When, however, feedback levels are highly discrepant, as when one child is continuously reinforced and the other is not, performance levels should be affected primarily by the individual's own reinforcement schedule. Under these circumstances, performance would be expected to deteriorate in the observing child over trials as the discrepancy in feedback is increased and direct reinforcement is not received.

In the present study, our primary aim was to examine the effects of observing another child receive reinforcement over an extended period of time. To the extent that implicit punishment and social comparison hypotheses account for performance under these conditions, it was expected that performance would increase initially due to evaluative arousal but that subsequent performance would worsen due to higher discrepancies in feedback and the accumulative effects of not being directly reinforced. In addition, we sought to determine the effectiveness of intermittent reinforcement delivered to the observing child as a potential strategy to reverse the unexpected and debilitating effects that we had observed in our earlier studies.

METHOD

Subjects

Forty-eight white, middle to upper middle-class, 4- to 5-year-old children (24 boys; 24 girls) participated. They had Peabody Picture Vocabulary Test IQs ranging from 110 to 140 (M = 120.33, SD = 10.10).

Children were assigned randomly to same-sex pairs. In all pairs, one child was arbitrarily selected to receive direct praise for performance (praised child). In half the pairs, the other child received no praise for performance (observing child); in the remaining half, the other child received direct praise on an intermittent schedule (intermittently praised child).

Experimenters, Task, and Procedure

Two trained undergraduate females served as experimenters. Two other undergraduate females served as reliability judges.

The experimental task consisted of 10, 12-piece puzzles. In pretesting, these children completed the puzzles in an average of 96 seconds. For the present study, 60 seconds were allotted for completion of each puzzle. The 10 puzzles were administered in a random order to each child in each pair. Performance was measured across three sessions scheduled 2 to 3 days apart.

For each session, children were seated adjacent to one another along one side of a worktable with the experimenter on the other side. Children were told they had 10 puzzles to do and 1 minute to do each. Following performance on each of the 10 puzzles (trials), children were continuously praised, intermittently praised, or not praised at all depending on their experimental condition assignment.

For the first set of pairs, one child was continuously praised and the other was not. The experimenter looked directly at the praised child, smiled, patted him or her on the shoulder, and said, "That's really good, ——————. You did very well with your puzzle. You really worked hard. That's great! Congratulations." No verbal or nonverbal praise was delivered to the observing child.

For the second set of pairs, one child was continuously praised in the same manner and the other child was praised on an intermittent schedule. For the intermittently praised child, praise was delivered on Trials 1, 3, and 5 only.

Reliability

Reliability judges observed whether the experimenters gave both verbal praise and nonverbal encouragement to the designated child only on those trials specified. Reliability was 100%. Reliability judges also recorded the number of puzzle pieces completed by each child on each trial. Agreement was obtained on 98% of the trials.

RESULTS

For the first set of pairs, children were divided into those who received continuous praise (CR1) and those who observed (NR). For the second set of pairs, children were divided into those who received continuous praise (CR2) and those who received praise on an intermittent basis (PR). This assignment of children resulted in four groups: CR1, NR, CR2, and PR. For each group, performance was measured over three sessions and across the 10 trials in each session. Performance in the various conditions was evaluated through a groups (4) $\times$ sessions (3) $\times$ trials (10) analysis of variance, followed by tests for simple effects and Duncan multiple range analyses where appropriate. In addition, individual data are presented to report the number of children who were differentially affected by these experimental manipulations. Results are reported separately for the two sets of pairs of children for ease of presentation and clarity of interpretation.

Effects of Multiple Sessions for the First Set of Pairs

In Figure 1, the mean number of correct puzzle placements are displayed. The performance

of children in the observed group (NR) paralleled that of children in the continuously praised group (CR1) for the first two trials of Session 1. However, performance of the observing children decreased significantly below that of praised children for Trials 3, 4, and 5 but then surpassed the performance of praised children on Trial 6. No differences existed on Trial 7, but performance of the observing children decreased significantly below that of the praised children once again on Trials 8, 9, and 10. These differences were all statistically reliable ($p < .05$). Further, performance of children in the praised group increased over trials during Session 1 whereas that of children in the observed group was marked by variable increments and decrements in performance. Overall, the mean performance of the praised group ($M = 9.20$) in Session 1 was significantly greater than that of the observed group ($M = 7.53$, $p < .05$). This pattern was evident for 11 of the 12 pairs and affirmed those of our earlier studies.

Of particular interest in this study was the performance of observing children, compared with that of praised children in Sessions 2 and 3. During Session 2, performance of children in the observed group was greater ($M = 9.47$) than that of the performance of children in the

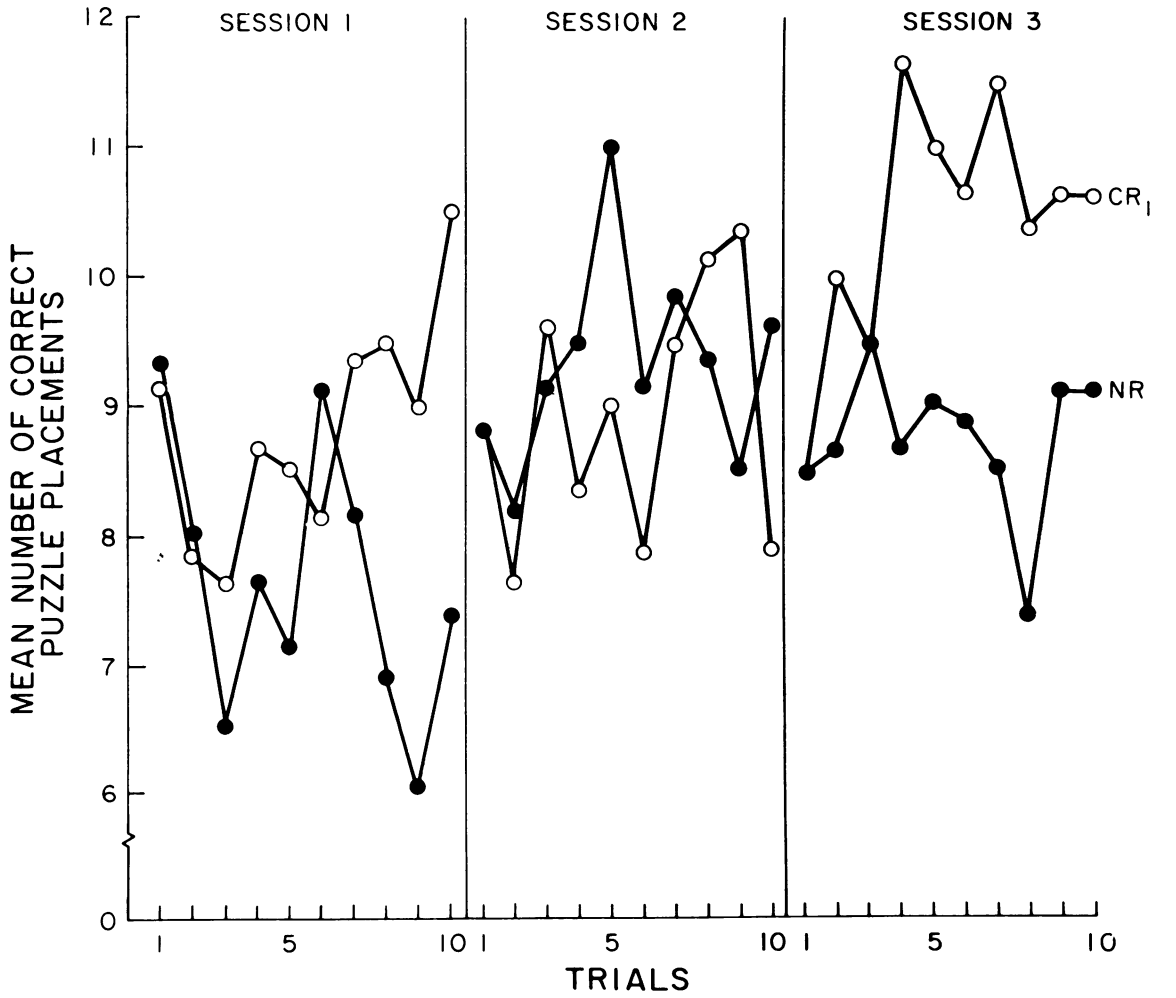

Fig. 1. Mean number of correct puzzle placements of children in the continuous reinforcement (CR1: O—O) and the observed reinforcement (NR: ●—●) groups for the 10 trials in each of the three sessions: Replication Condition.

praised group ($M = 8.92$), though not significantly so. This pattern was evident in 10 of the 12 pairs.

The findings associated with Session 3, however, indicated that these "rebound" effects were short-lived. During Session 3, performance of children in the observed group decreased to a level ($M = 8.73$) below that of Session 2 and to a level approaching that of Session 1. On the other hand, performance of children in the praised group increased ($M = 10.47$), significantly surpassing that of either Session 1 or Session 2 ($p < .05$). These differential levels of performance resulted in a significant difference between the praised and observing children ($p < .05$). This difference was evident for all 12 pairs.

In sum, the findings associated with the first set of pairs indicate that the effects of observing another child receive praise are highly complex. Initially, the observing child performs at a level comparable to the praised child, as suggested by vicarious reinforcement and social comparison hypotheses. However, such similarity in performance is short-lived, as performance soon decreases. During the second session, performance of the observing child increases beyond that obtained in the first session and to a level equivalent to that of the praised child. Finally, during the third session, performance of the observing child levels off whereas that of the directly praised child continues to increase. Such findings replicate our earlier efforts and extend them to illustrate the robust quality of these effects across multiple sessions.

Effects of Intermittent Praise for the Second Set of Pairs

Given these findings, as well as our earlier ones, we were interested in determining the effects of praise delivered on an intermittent schedule to the otherwise observing child. To examine this, we again provided continuous praise to one child, while praising the "observing" child on an intermittent basis; namely, on the first, third, and fifth trials of each session.

Figure 2 shows that the performance of children in the intermittent group exceeded that of children in the continuous group on Trials 2, 4, 5, 6, 8, and 10 ($p < .05$) during Session 1. The two groups did not differ on Trials 1, 3, and 9. Overall, the mean performance of the intermittent group ($M = 10.26$) was significantly greater than that of the continuous group ($M = 7.93$, $p < .05$), a pattern evident for 11 of the 12 pairs.

During Sessions 2 and 3, performance of the intermittent group continued to be higher than that of the continuous group, although not significantly so. This pattern was present for nine of the pairs in Session 2 and eight of the pairs in Session 3.

In sum, findings with the intermittent condition indicate that intermittent praise to the otherwise observing child serves to reverse the previous patterns. In fact, the intermittently praised child who observed his or her counterpart receive continuous praise performed higher during the first session and at comparable levels during subsequent sessions.

DISCUSSION

Important findings related to the effect of observing another child receive reinforcement were evident in the present study. First, the findings of our previous studies were replicated and extended across multiple sessions. Initially, children who observed other children receive praise performed according to vicarious reinforcement and social comparison hypotheses (Bandura, 1971; Seta, 1982). That is, they responded as if they too were being praised and their performance increased. However, their performance soon waned and dropped to a level below that which they had previously emitted. Clearly, it appeared as if they were being implicitly punished as suggested by Sechrest (1963) and reaffirmed by us (Ollendick et al., 1982; Ollendick & Shapiro, in press). Interestingly, when these observing children returned to this situation on a subsequent occasion (Session 2),

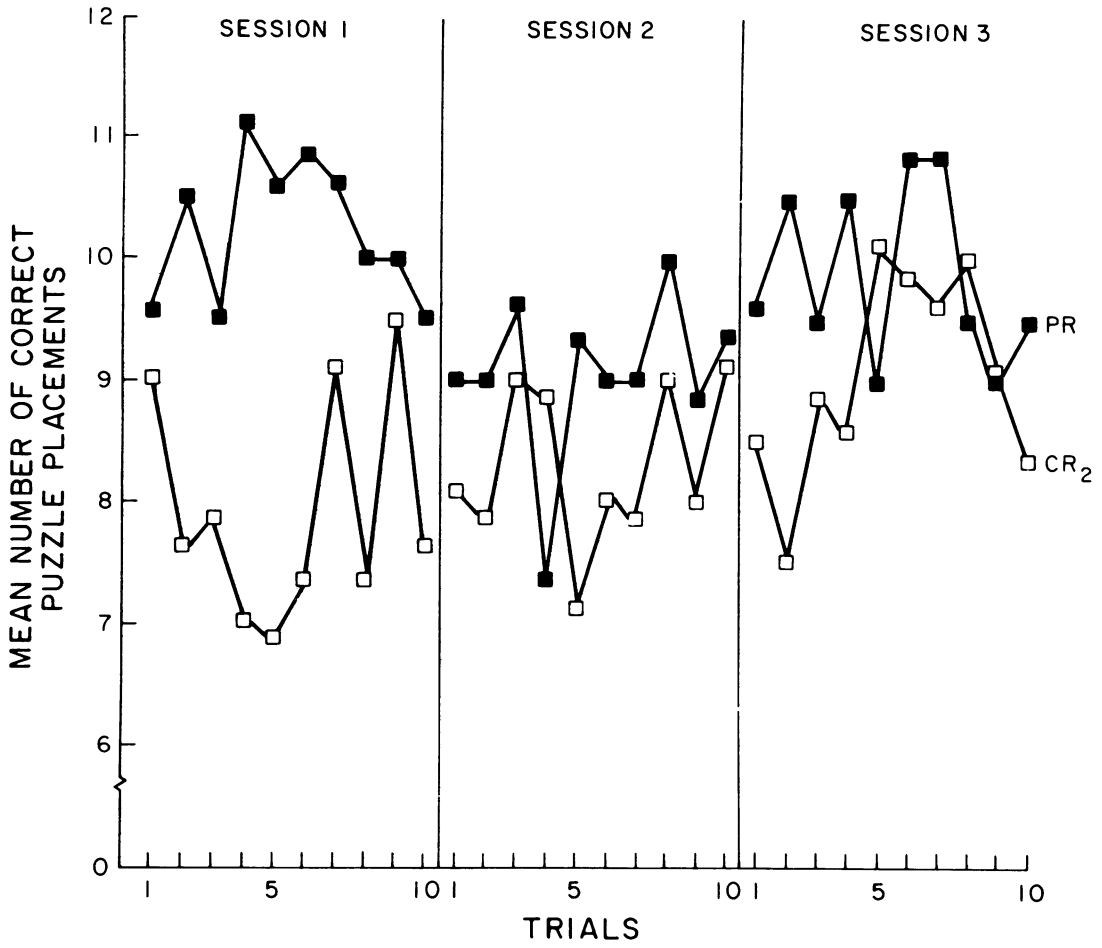

Fig. 2. Mean number of correct puzzle placements for children in the continuous reinforcement (CR2: □—□) and the partial reinforcement (PR: ■—■) groups for the 10 trials in each of the three sessions: Partial Reinforcement Condition.

they responded with greater vigor and out-performed the praised children. This pattern suggested that these children were making a concerted effort to procure praise much like they had during the early trials of Session 1. Anecdotally, this interpretation was supported by verbal statements such as "Come on, I can do them too," and "Look at me, too." In contrast, during the third session in which the performance of children in the observed group dropped below that of the children in the praised group, the children appeared to have "given up" and to have become resigned to the notion that no matter how hard they tried, praise was not forthcoming. Statements such as "I quit," "You don't like me," and "I'll tell my mommy about this" were noted. Unfortunately, these qualitative statements were not recorded systematically or quantitatively. Nonetheless, it appeared that these observing children were being implicitly "punished." By comparison, they were not being praised for performance that was similar, at least initially, to that of the praised child. Such an event might well be perceived as punishing (Sechrest, 1963).

The findings of the present study are also of interest in that they begin to elucidate the conditions under which the unexpected, negative effects of observing another child receive reinforcement can be reversed. In the present study, intermittent praise delivered to the observing child served to offset these detrimental effects.

In fact, the intermittently praised child was observed to perform at the same level as the continuously praised child. The detrimental effects of observing another child receive continuous reinforcement were clearly reversed through this process.

The present findings appear to have direct bearing on the use of vicarious reinforcement in applied settings. Before its routine use can be endorsed, it seems imperative to note that "unexpected" effects can and do occur. As illustrated in this study, one way of dealing with these negative effects is to ensure that observing children are also reinforced, at least on an intermittent basis. Thus, we would add an additional point to Kazdin's (1979) guidelines regarding the use of observed reinforcement in applied settings. He suggested that the delivery of direct consequences be arranged in such a way to provide maximal information to the observers about the desired behaviors, the available consequences, and the times at which these consequences are available. Our findings indicate that even when these conditions are met, the expected effects of observed reinforcement do not necessarily occur. Unless the observing child is directly reinforced on an intermittent basis, his or her performance does not correspond to that predicted by vicarious hypotheses.

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