

The effects of extrinsic reward timing on intrinsic motivation

WILLIAM L. CROLL and R. MARK SMITH
Carleton University, Ottawa, Ontario, Canada

Extrinsic rewards often decrease children's intrinsic motivation. By varying the timing of the reward offer, the present study sought additional information about the processes underlying this decrease. One group of preschool children were offered a reward before they agreed to perform an interesting task. A second group received the reward offer after they had agreed to perform the task. Both of these groups declined in motivation relative to a control group that were not promised a reward. This pattern of results is predicted by frustration theory but not by attribution theory, suggesting that frustration from delay of reward may sometimes contribute to the deleterious effects of rewards on children's motivation.

If children are promised a reward for doing something interesting, their interest often declines. Lepper and Greene (1978) and Ross (1976) have reviewed a number of studies that delineated the conditions under which this decline occurs, together with several hypotheses that have been advanced to account for it. Two hypotheses, one based upon attribution theory and the other upon frustration theory, appear to offer the most satisfactory explanation. According to the attribution analysis, when a child is promised a reward for doing something interesting, he/she attributes his/her subsequent performance to the promised reward rather than to his/her intrinsic interest, thereby diminishing his/her belief that the task is interesting. According to the frustration analysis, when a child is promised that he/she will later receive a reward, he/she experiences frustration from delay of gratification. This frustration becomes associated with the task and thus produces a decline in its interest value.

In many situations, attribution and frustration theory make the same predictions. In a few experiments, however, differential predictions have been tested, and the evidence seems to favor attribution theory (Lepper & Greene, 1978). However, the fact that attribution theory provides a better explanation in some situations does not entail that frustration never plays a role—especially when the subjects are children, who may be more easily affected by frustration than adults.

The present study obtained further information about the role of frustration. Previous studies of the effects of reward on children's intrinsic motivation have shared a common methodological feature: The children who were promised a reward received the promise *before* they agreed to perform the task. When reward is used in this way to induce children to perform a task, both hypotheses predict that there will be a decrease in

intrinsic motivation compared with that of a control group that is not promised a reward. In contrast, if the reward is offered *after* the child has already agreed to do the task, then the two hypotheses make different predictions. The frustration hypothesis continues to predict a decline in intrinsic motivation because performance of the task is still paired with delay of gratification. The attribution hypothesis, however, predicts that a decline should not occur: Since the child has agreed to do the task before the reward is mentioned, he/she should attribute his/her performance to its intrinsic interest rather than to the reward.

The present study manipulated the timing of the promise of reward in order to test these differential predictions of attribution and frustration theory. One group of children were promised a reward before they agreed to perform an interesting task; a second group were promised a reward after they agreed to perform the task; and a third group served as a control by receiving no promise of a reward.

METHOD

The subjects were 45 children aged 2 years 11 months to 5 years 3 months (mean = 4 years 1 month) who were enrolled in a University laboratory preschool. There were 25 boys and 20 girls, all from middle-class families. The materials, procedures, and design paralleled those in Lepper, Greene, and Nisbitt's (1973) prototypical study. The first phase of the study was a baseline period for assessing each child's intrinsic interest in the task, which consisted of drawing with colored felt-tipped pens. Drawing was made available during the 1st hour of each morning and afternoon session on Monday, Wednesday, and Friday of 1 week. During this baseline period, the teachers replaced drawing paper on the table as it was used, but did not sit at the table or encourage or discourage the children to draw. An observer behind a one-way mirror recorded the amount of time each child spent drawing. A child was judged to be engaged in the drawing activity if he/she: (1) had his/her hand on a pen, (2) was seated at the drawing table, or (3) was standing beside the table with an apparent interest in participating.

The experimental phase of the study took place during the week following the original baseline session. The children were

Reprints may be obtained from William L. Croll, Department of Psychology, Carleton University, Ottawa, Canada K1S 5B6.

divided into three subgroups. The children in the precommitment group were promised a reward if they would engage further in the drawing activity. They were told: "I have some of these Good Player Awards to give to children who will help me out by drawing some pictures . . . [description of award] . . . I'll give you one of these Good Player Awards if you draw some pictures for me. Would you like to win a Good Player Award?" Children in the postcommitment group were first asked if they would like to draw some pictures. After they had agreed, the award was mentioned incidentally: "Oh, yes, I almost forgot to tell you something. I have some of these Good Player Awards for children who draws pictures . . . [description of award]." Children in the unexpected-reward control group were never promised a reward, but received one unexpectedly after they had finished drawing. Assignment of the children to these three groups was random, except that the groups were matched as closely as possible for intrinsic motivation. This matching was accomplished by ranking all of the children in terms of the amount of drawing during the baseline period. The rank-ordered subjects were then grouped into blocks of three subjects, with the first block including the three subjects who showed the highest interest, the second block including the three subjects who occupied positions 4-6 in the ranking, and so on, to the last block, which included the three subjects who showed the lowest baseline level of interest. One subject from each of these blocks was assigned randomly to each of the three experimental conditions. All testing during the experimental phase was done individually in a small room adjoining the preschool. The children were given drawing materials identical to those used in the baseline period and were allowed 6 min to draw. The experimenter remained present during this period, showing interest in the child's drawing but not providing explicit approval for the child's performance. When the 6-min period ended, the child received a "good player award," which was placed on a bulletin board in the testing room.

The third phase of the study took place during the week following the experimental phase. It consisted of a baseline phase identical to the first baseline period. The observer doing the recording was not aware of the experimental conditions to which the children had been assigned.

RESULTS AND DISCUSSION

The observational technique for measuring the amount of time spent drawing during the two baseline periods was highly reliable. A second observer was present at random times during both baseline sessions, and his observations correlated $r = .99$ with those of the main observer.

The primary analysis examined the scores from the second baseline period to determine whether there were differences among the three groups as a function of different treatments during the experimental phase. Furthermore, since there is some indication that the effects of these treatments may interact with the child's preexisting level of motivation (Lepper et al., 1973), the children in each of the three experimental groups were subdivided into three subgroups on the basis of their level of motivation during the first baseline period. Table 1 shows the mean proportion of time spent drawing during the second baseline period for each combination of experimental condition and initial level of intrinsic motivation. Analysis of variance on these scores yielded a significant main effect for experimental condition [$F(2,36) = 6.56, p < .005$], a significant main effect for initial level of interest [$F(2,36) = 14.11, p <$

Table 1
Proportion of Time Spent Drawing in Second Baseline Period

Initial Interest	Experimental Treatment		
	Unexpected Reward	Pre-commitment	Post-commitment
High	.293	.072	.075
Intermediate	.049	.066	.092
Low	.044	.022	.014

.001], and a significant interaction [$F(4,36) = 7.33, p < .001$]. Pairwise comparisons were made among the three experimental conditions at each level of initial interest using Tukey's HSD procedure. These tests revealed that, during the postexperimental baseline period, (1) there were no differences among experimental conditions for subjects who had been either intermediate or low in initial interest ($p > .05$), and (2) for subjects who were initially high in interest, postexperimental interest was higher in the control group than in the precommitment and postcommitment groups ($p < .01$), the latter two groups not differing from each other ($p > .05$).

A separate analysis examined performance quality during the experimental session. Each drawing was rated on a 5-point scale of quality by each of four adult raters. These scores were then averaged to produce a mean quality score for each child. An analysis of variance of these scores indicated that there were no significant differences among the three groups in drawing quality.

These results suggest that promised rewards decrease children's intrinsic motivation, regardless of whether the promise precedes or follows the children's commitment to perform the task. This pattern of results is predicted by frustration theory, but is not predicted by attribution theory. Thus, it appears that (at least in children) frustration may play a role in mediating the effects of rewards on intrinsic motivation. This does not, of course, indicate that attributional processes are irrelevant in mediating this effect—in fact, the role of attributional processes has been well documented (Lepper & Greene, 1978; Ross, 1976). Rather, it appears that both frustration and attributional processes play a role. Since most studies have focused on attributional processes (Ross, 1976), the present results suggest that the role of frustration warrants further investigation. For example, personality and demographic variables related to a child's ability to withstand frustration might help to delineate the conditions under which reward will have deleterious effects on motivation. The techniques recently developed by Ransen (1980) appear to be particularly suitable for such an investigation.

REFERENCES

- LEPPER, M. R., & GREENE, D. (1978). Overjustification research and beyond: Towards a means-ends analysis of intrinsic and extrinsic motivation. In M. R. Lepper & D. Greene (Eds.), *The hidden costs of reward: New perspectives on the psychology of human motivation*. New York: Erlbaum.

LEPPER, M. R., GREENE, D., & NISBETT, R. E. (1973). Undermining children's intrinsic interest with extrinsic rewards: A test of the "overjustification" hypothesis. *Journal of Personality and Social Psychology*, **28**, 129-137.

RANSEN, D. L. (1980). The mediation of reward-induced motivation decrements in early and middle childhood: A template matching approach. *Journal of Personality and Social Psychology*, **39**, 1088-1100.

ROSS, M. (1976). The self perception of intrinsic motivation. In J. H. Harvey, W. J. Ickes, & R. F. Kidd (Eds.), *New directions in attribution research*. Hillsdale, NJ: Erlbaum.

(Manuscript received for publication April 2, 1984.)