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UNDERMINING CHILDREN'S INTRINSIC INTEREST WITH EXTRINSIC REWARD:

A TEST OF THE "OVERJUSTIFICATION" HYPOTHESIS

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A field experiment was conducted with children to test the "overjustification" hypothesis suggested by self-perception theory—the proposition that a person's intrinsic interest in an activity may be decreased by inducing him to engage in that activity as an explicit means to some extrinsic goal. Children showing intrinsic interest in a target activity during base-line observations were exposed to one of three conditions: In the expected-award condition, subjects agreed to engage in the target activity in order to obtain an extrinsic reward; in the unexpected-award condition, subjects had no knowledge of the reward until after they had finished with the activity; and in the no-award condition, subjects neither expected nor received the reward. The results supported the prediction that subjects in the expected-award condition would show less subsequent intrinsic interest in the target activity than subjects in either of the other two conditions.

The process by which man seeks to understand his environment—to discern the causes of events which surround him and explain the behavior of others toward him—has been of central concern to social psychology for many years (e.g., Brunswik, 1934; Heider, 1958; Michotte, 1946); but only in the past few years have psychologists concerned themselves with the process by which man explains and understands his own actions and their causes (Bem, 1965, 1967, 1972; Jones & Davis, 1965; Jones, Kanouse, Kelley, Nisbett, Valins, & Weiner, 1972; Kelley, 1967). Recently, theoretical analyses of the process of self-perception or self-attribution by Bem (1965, 1967) and by Kelley (1967) have suggested that processes of self-perception have a common ground with those of other-perception.

When an individual observes another person engaging in some activity, he infers that the other is intrinsically motivated to engage in that activity to the extent that he does not perceive salient, unambiguous, and sufficient extrinsic contingencies to which to attribute the other's behavior. Self-perception theory proposes that a person engages in similar processes of inference about his own behavior and its meaning. To the extent that the external reinforcement contingencies controlling his behavior are salient, unambiguous, and sufficient to explain it, the person attributes his behavior to these controlling circumstances. But if external contingencies are not perceived, or if they are unclear, invisible, and psychologically insufficient to account for his actions, the person attributes his behavior to his own dispositions, interests, and desires.

Originally, self-perception theory was proposed as an alternative explanation of the large dissonance literature on "insufficient

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justification" (cf. Aronson, 1966), where subjects are induced to engage in unpleasant or attitudinally inconsistent behavior under conditions of either clearly sufficient or psychologically inadequate external justification. Typically, these studies have demonstrated that subjects given little extrinsic justification for the behavior they have been induced to perform come to believe that their actions were intrinsically motivated. In a self-perception analysis, this outcome is simply the result of a self-directed inference process. In the low-justification conditions, the subject infers from his behavior and the lack of apparent external pressure that he must have wished to act as he did; while in the high-justification conditions, the subject infers that his behavior was determined by the external pressures in the situation.

Besides its application to many classic dissonance paradigms, self-perception theory has a number of heuristic implications, one of the most intriguing of which could be termed the "overjustification" hypothesis—the proposition that a person's intrinsic interest in an activity may be undermined by inducing him to engage in that activity as an explicit means to some extrinsic goal. If the external justification provided to induce a person to engage in an activity is unnecessarily high and psychologically "oversufficient," the person might come to infer that his actions were basically motivated by the external contingencies of the situation, rather than by any intrinsic interest in the activity itself. In short, a person induced to undertake an inherently desirable activity as a means to some ulterior end should cease to see the activity as an end in itself.

While the existence of such an overjustification effect has been postulated by a number of authors (DeCharms, 1968; Deci, 1971; Kruglanski, Friedman, & Zeevi, 1971; Lepper, 1973; Nisbett & Valins, 1971), this proposition has received virtually no experimental examination. Nisbett and Valins (1971) reviewed several studies which, on reinterpretation, provided evidence consistent with this proposition, but the first study to intentionally pursue a directly related hypothesis was that of Deci (1971).

Specifically, Deci hypothesized that rewarding subjects with money and "closely related tangible rewards" for engaging in an intrinsically interesting task would decrease their subsequent interest in that task in the absence of such external rewards. To test this proposition, Deci asked college subjects to solve a number of inherently interesting puzzles during three experimental sessions. Following an initial base-line session for all subjects, one group of subjects was paid for solving a second series of puzzles, while a second group was not paid. In a third session neither group was paid. During a break in each session, subjects were left alone for a few minutes to do whatever they wished, including continuing work on the puzzles. During this time, the subjects' behavior was observed and recorded from behind a one-way mirror. Subjects who had been paid during the second session tended to show a greater decrease in intrinsic interest from the first to the third session than subjects who had not been paid. This result was consistent with the overjustification hypothesis, but unfortunately this finding was of only marginal statistical significance and depended as much on differences between the groups during the base-line session as during the final sessions.

Deci (1971) couched his hypothesis in terms of monetary or other material rewards. As an implication of self-perception theory, however, the overjustification hypothesis is formulated in terms of the perception of oneself as having undertaken an activity *in order to obtain some extrinsic goal.* The nature of the extrinsic goal should be of little consequence. Thus, an overjustification effect is predicted for any situation which results in an extrinsic attribution where previously intrinsic interest was the only salient attribution. Contracting explicitly to engage in an activity for a reward should undermine interest in the activity, even when the reward is insubstantial or merely symbolic. Conversely, receipt of an unforeseen, unexpected reward *after* engaging in an activity should have little or no detrimental effect, even when the reward is a highly prized material one.

This analysis suggests two features necessary for an unequivocal test of the overjusti-

fication hypothesis: (*a*) a subject population intrinsically motivated to engage in a target activity and (*b*) a comparison of two experimental treatments—one in which subjects are asked to engage in this activity as a means to some extrinsic goal and one in which subjects are asked to engage in the activity for its own sake but subsequently receive the same extrinsic reward. Subjects who expect a reward should show less subsequent intrinsic interest in the target activity than subjects who do not. An appropriate test of this hypothesis requires a dependent measure taken some time after the experimental sessions and in a situation as different as possible from that in which the rewards were administered. Thus, in this study the rewards were delivered in an experimental room, while the dependent measure of intrinsic interest was obtained in a naturalistic field setting.

The present experiment was conducted with children in an educational setting in order to test the overjustification hypothesis in a context where its practical implications may be greatest. The notion of overjustification immediately raises issues relevant to two widespread "contractual" techniques—one old and one new—of controlling the behavior of school children. The long-established practice of giving grades, gold stars, and similar awards to children is, in the present terms, a contractual one likely to induce the cognition, "I am doing this [arithmetic, drawing, reading] *in order to. . . .*" The newly developed "token economies," in which children are offered redeemable tokens for desirable behavior, seem quite likely to produce the same cognition. The overjustification hypothesis implies that such contractual techniques may backfire for at least those children initially interested in the activities presented in such a context. Demonstrating an overjustification effect in an educational setting, therefore, would suggest the need for greater attention to the possible side effects and long-term consequences of powerful systems of extrinsic rewards.

METHOD

Overview

Preschool children showing initial intrinsic interest in a drawing activity during base-line observations in their classrooms were selected as subjects for the experiment. These subjects were blocked by degree of initial interest in the activity and assigned randomly to one of three treatment conditions: In the expected-award condition, subjects agreed to engage in the drawing activity in order to obtain an extrinsic reward—a certificate with a gold seal and ribbon. In the unexpected-award condition, subjects engaged in the same activity and received the same reward, but had no knowledge of the reward until after they had finished the activity. In the no-award control condition, subjects neither expected nor received the reward, but otherwise duplicated the experience of the subjects in the other two conditions. These experimental sessions were conducted individually in a room apart from the subjects' classrooms. The target-drawing activity was again introduced into the children's classrooms 1–2 weeks after the experimental sessions. Measures of subsequent intrinsic interest were obtained unobtrusively by covert observation of the classrooms from behind a one-way mirror.

Subject Population

Subjects were selected from the student population at the Bing Nursery School, located on the Stanford University campus. These children, ranging in age from 40 to 64 months, were of predominantly white, middle-class backgrounds and of average or above-average intelligence. Three black children who would otherwise have been included in the experiment were arbitrarily excluded from the subject pool in order to increase the precision with which the population could be defined.

Observational Setting

The nursery school's facilities included three classrooms in which independent programs were run simultaneously. In each classroom, three different classes, each consisting of about 35 children and four to five teachers, met for either 2 or 3 half-days per week. The present study was conducted with four of these classes in the two classrooms equipped with one-way mirrors and sound equipment for observational purposes.

The program in these classrooms was such that with the exception of a single 15-minute "juice" break, children were free throughout the day to choose among a variety of activities. Some activities (such as building blocks, easels, housekeeping equipment, and outdoor activities) were available to them continuously; others (such as collage materials, "play dough," and drawing materials) were made available periodically by their teachers. Typically, at the beginning of each class session, children took note of the "periodic" activities, which had been set out for the day on each of three tables located near the center of the classroom.

For the purposes of the present study, the arrangement provided an opportunity to introduce a novel "target" activity into the ongoing nursery school program on a periodic basis. Moreover, the

activity could easily be integrated into the normal classroom routine without the experimenters having to be present. It was thus possible to obtain an unobtrusive measure of the children's intrinsic interest in the target activity in a situation in which the activity was not associated with the experimenters or any extrinsic reward.

Experimental Activity

The experimental activity was chosen to meet three criteria: (*a*) sufficient similarity to other typical periodic activities so as not to appear out of place, (*b*) sufficient attractiveness to ensure that most children would express at least some initial interest, and (*c*) amenability of the activity to some objective definition of interest. These criteria were met handily by the opportunity to draw freely with multicolored felt-tipped drawing pens ("magic markers") not normally available in the children's classrooms.

Measurement of Intrinsic Interest

Base-line data on initial interest were collected during the first hour of 3 consecutive class days. On days when data were to be collected, a few minutes before the class began, the teachers placed a set of magic markers and a sheaf of fine white artist's drawing paper on a hexagonal table located directly in front of the observational mirror. After the first hour of class, these materials were replaced with some other table activity. Thus the target activity was available to a child from the time he arrived until the end of the first hour of class and was presented by the teachers as simply another activity with which the children might choose to play.

During this hour, two observers were stationed behind the one-way mirror, each equipped with a Rustrak eight-track continuous event recorder. The first six channels on both recorders were numbered to correspond to the six positions around the hexagonal target table. One observer was responsible for recording children's actions at Positions 1 through 4; the other was responsible for Positions 4 through 6 and Position 1. The data recorded on Channels 1 and 4 were used to test agreement between observers. For each observer, two additional channels (Channels 7 and 8 of each recorder) were available for recording behavior not clearly tied to one of the six positions at the table. Hence, the two observers were equipped to record data on up to 10 children at a time.

A child was defined as "interested" in the target activity whenever he either sat down in one of the six chairs at the target table or put his hand on a marker; he was considered no longer interested when he was neither sitting at the table nor in possession of a marker. In practice, typically, the first discrimination which had to be made by the observer was when the child should be considered "sitting." It was decided to regard the target table as a system with six regular inputs, such that whenever a child was effectively occupying one of these inputs to the practical exclusion of another child, he or she was considered to be sitting. This criterion was felt to be a more valid indication of interest than a "fanny-touching-seat" criterion and was only slightly more difficult to discriminate reliably. When a child reached for a marker before sitting down or got up from his seat to draw on the floor or somewhere else, his behavior was recorded by one of the observers on Channel 7 or 8.

The measurement procedure was highly reliable. A product-moment correlation of the records of the two observers for the 47 children who appeared on either Channel 1 or 4 proved close to unity ($r = .99$). To further ensure that this method of measurement would be as sensitive and accurate as possible, three slight modifications of standard classroom procedure were introduced. First, since the mere presence of an adult at any of the activity tables was highly correlated with the presence of several children, teachers and other adults were asked to defer all requests from children to sit at the table until the experimental activity had been removed. Second, highly similar materials (e.g., crayons, scissors, other paper, etc.) were made inaccessible to the children while the target materials were available in order to avoid forcing observers to make unnecessarily difficult judgments. Third, teachers recorded not only absences but also time of arrival for any children who arrived late on days of data collection. These data allowed the calculation for each child of a more precise index of interest, namely, the percentage of time that he chose to play with the experimental activity out of the total time that he was present while the materials were available.

At least some play was recorded during base-line periods for 102 of the 139 children who appeared in their respective rooms at any time during the 3 hours of measurement. All children whose total playing time exceeded 4 minutes of play with the target activity were blocked by class and sex within class and ranked in order of total playing time. Each of the eight class–sex blocks was divided into as many groups of 3 as possible, with extra children discarded from the bottom of the rankings. This procedure yielded a potential subject population of 24 boys and 45 girls. Within groups of 3, a table of random permutations was used to assign subjects to treatment conditions.

Experimental Procedure

Following the third hour of base-line observations in each class, the experimental materials were removed from the classroom until they were needed again for postexperimental observations. Experimental sessions began within 2 weeks after the base-line period and were completed for each class on 3 consecutive school days.

Two persons conducted each experimental session: The first experimenter brought the child to and from his classroom and administered the experimental

manipulation; the second experimenter stayed with the child while he was in the experimental room and administered the reward. Two (male) experimenters each played the role of the first experimenter for subjects from two of the four classes, and four (two males and two females) assistants each played the role of the second experimenter for subjects from one of the classes.

Potential subjects were approached by the first experimenter in their classrooms, engaged in play and/or conversation, and then asked if they would like to come to the "surprise room" with him. Twelve of 45 girls and 2 of 24 boys refused to come to the experimental room on three separate occasions and hence were lost from the experiment. Thus, 55 subjects actually participated in the experiment (19 each in the expected- and unexpected-award conditions, 17 in the no-award control group).

Each subject was brought individually to the experimental room by the first experimenter. The subject was seated at a child-sized table containing a set of magic markers and a sheaf of paper. At this point, the first experimenter had in his possession a sample "Good Player Award," the extrinsic reward employed in this study. These Good Player Awards —colored 3 × 5 inch cards with the words "Good Player Award" and spaces for the child's name and school engraved on the front next to a large gold star and a red ribbon—have proved effective rewards in previous studies (e.g., Harter & Zigler, 1972).

Presenting the drawing materials to the subject, the first experimenter said,

> Do you remember these magic markers that you played with back in your room? Well, there's a man [lady] who's come to the nursery school for a few days to see what kinds of pictures boys and girls like to draw with magic markers.

For subjects in the unexpected-award and the no-award groups, the first experimenter continued,

> Would you like to draw some pictures for him?

For subjects in the expected-award condition, the first experimenter produced the sample Good Player Award and continued instead,

> And he's brought along a few of these Good Player Awards to give to boys and girls who will help him out by drawing some pictures for him. See? It's got a big gold star and a bright red ribbon, and there's a place here for your name and your school. Would you like to win one of these Good Player Awards?

Each subject indicated assent to the first experimenter's final question, typically with considerable enthusiasm. For all subjects the first experimenter concluded,

> Good. He should be right outside. I'll go get him.

The first experimenter introduced the second experimenter to the subject and then excused himself, leaving the second experimenter alone with the subject. The second experimenter sat down across the table from the subject, started a stopwatch, and asked the subject, "What would you like to draw first?" Most of the time the subject began to draw a picture immediately; when he did not, a little coaxing was always sufficient to get him started. During the session, the second experimenter was friendly but not overly responsive to the subject. Generally, he attempted to show interest in, rather than explicit approval of, the subject's performance.

Each subject was allowed 6 minutes to draw pictures. If the second experimenter felt that an interruption after precisely 6 minutes was inopportune, up to 30 seconds more was provided. This procedure was designed to control against confounding of the classroom measure by satiation effects. The drawings made by each child were kept to allow an examination of the child's performance, during experimental sessions, along both quantitative and qualitative dimensions. Ratings of these drawings on a number of descriptive indexes were made by judges blind to the subject's condition.

The second experimenter was completely blind to the subject's condition for the first 5 minutes of the session. At the end of 5 minutes, the second experimenter casually looked inside a manila folder which had been left on the table by the first experimenter to determine whether the subject was to receive an award or not. After this point, the second experimenter knew only whether the subject was in one of the two award conditions as opposed to the no-award control condition.

One minute later, the second experimenter looked conspicuously at his stopwatch and said,

> Well, it looks like our time is up. Thank you very much for helping me out by drawing these pictures for me. You really did a good job.

For subjects who were to receive an award, the second experimenter continued as follows:

> In fact, you have been such a big help to me that I have something very special to give you. [The second experimenter rose, got a Good Player Award and a black pen, and returned to the table.] I'm going to give you one of my Good Player Awards, with your name and school on it. [The second experimenter showed the award to the subject and wrote the subject's name and school on the award with a flourish.] Now turn around and let me show you our special Honor Roll board where you can put your award so that everyone will know what a good player you are! [The second experimenter stood as he spoke, walked to the corner of the room, and pulled back a standing slat screen to expose a bulletin board. This board was decorated with the title "Honor Roll" and contained a standard display of several Good Player Awards. The second experimenter escorted the subject to the bulletin board and placed a push pin through the top of his award.] You can put your Good Player Award anywhere

TABLE 1

MEAN PERCENTAGE OF FREE-CHOICE TIME THAT SUBJECTS CHOSE TO PLAY WITH THE TARGET ACTIVITY, BY TREATMENTS

Experimental condition	*n*	%
Expected award	18	8.59
No award	15	16.73
Unexpected award	18	18.09

you want on the Honor Roll Board. That looks very nice.

Then, for all subjects, the second experimenter said,

Now, let's see if we can find [the first experimenter] to take you back to your room.

As the second experimenter opened the door, the first experimenter entered and returned the subject to his classroom.

Postexperimental Observations

The observational setting and data collection procedure were the same as during the base-line periods. Observers were blind to the conditions of the subjects. Data collection began 7 to 14 days after the last subject had been run in a given class and was completed over no more than 4 consecutive school days for each class. In three of the classes, one of the first three class meetings had to be skipped for reasons ranging from the unanticipated arrival of a goat in the classroom to equipment failure. Four subjects were lost during these sessions: Three were never in class during the three observational sessions; a fourth was present for only 10 out of a possible 180 minutes and was discarded, although inclusion of his data would not have affected the significance or pattern of the data reported. The final sample, then, consisted of 51 children—19 males and 32 females. There were 18 subjects in both the expected-award and the unexpected-award conditions and 15 subjects in the no-award condition.

RESULTS

The overjustification hypothesis led to the anticipation that subjects in the expected-award condition would show less subsequent intrinsic interest in the target activity than subjects in the unexpected-award and no-award conditions. The data relevant to this proposition—the mean proportion of time that children chose to play with the target activity in the postexperimental sessions—are presented in Table 1.

It may be seen that as predicted, children in the expected-award condition spent less time playing with the drawing materials than children in the other conditions. Preliminary analysis of the data by sex of child revealed no significant sex difference and no interaction of sex of child with experimental condition. The data were therefore collapsed across this dimension for purposes of analysis. Since the variances of the treatment groups were significantly different ($F_{max} = 5.39$, $df = 3/17$, $p < .01$) and the standard deviations of the groups were proportional to the means, a log transformation [$Y' = \ln (Y + 1)$] was performed on the data to produce homogenous treatment variances (Winer, 1962, p. 221). These transformed data were submitted to a one-way unweighted-means analysis of variance, which is presented in Table 2. This analysis yielded a significant effect of experimental treatments on subsequent intrinsic interest in the experimental materials ($F = 3.25$, $df = 2/48$, $p < .05$). To clarify the precise nature of this effect, a contrast was performed to test the specific prediction of the study. This contrast proved highly significant ($F = 6.19$, $df = 1/48$, $p < .025$), accounting for most of the systematic variance and indicating that subjects in the expected-award condition chose to spend a smaller proportion of their time playing with the target materials than subjects in either the unexpected-award ($t = 2.32$, $p < .025$) or the no-award ($t = 2.05$, $p < .025$) conditions.[2]

In addition, although blocking subjects on initial interest in the target activity of course eliminated any between-groups differences in this variable, it is of some interest to compare postexperimental interest with original interest within each treatment condition. Sub-

[2] All p values reported in this article are based on two-tailed tests of significance.

TABLE 2

ANALYSIS OF VARIANCE ON TRANSFORMED PROPORTIONS OF TIME SPENT WITH TARGET ACTIVITY

Source	*df*	*MS*	*F*
Between	2	3.96	3.25*
Contrast	1	7.55	6.19**
Residual	1	.37	<1
Within	48	1.22	

* $p < .05$.
** $p < .025$.

jects in both the unexpected-award and no-award conditions showed very slight and nonsignificant (both ts < 1) increases in interest from preexperimental to postexperimental measurement sessions. Subjects in the expected-award condition, however, manifested a significant decrease in interest in the target materials from base-line to postexperimental sessions ($t = 2.61$, $p < .02$).

Some readers may find it surprising that receipt of the award did not increase the interest of children in the unexpected-award group. It should be recalled, however, that subjects were selected on the basis of their relatively great initial interest in the drawing activity. There would be little reason to expect that the award would have had much effect on the behavior of children for whom the drawing activity was already highly salient and pleasurable. On the other hand, the range of initial interest was fairly large, and it might be expected that the award would have had some effect among those children in the present sample with relatively little interest. This was apparently the case. Each experimental group was divided into two groups on the basis of initial interest in the drawing activity. Of the resulting six groups, only the children in the unexpected-award group who were below the median in degree of initial interest showed a substantial increase in interest following the experimental manipulation ($t = 2.35$, $p < .05$). Children above the median in initial interest in the unexpected-award group showed a trivial decrease in interest, and children in the control (no-award) group, whether above or below the median, showed a trivial increase in interest.

It would be of some theoretical interest to know whether the expected-award treatment had a different effect on children high in initial interest than on children low in initial interest. Unfortunately, the data do not allow a clear answer to this question. Both the high group and the low group declined in interest in the drawing activity. The high group declined more than the low group, but this could have occurred either because the manipulation was more effective for the high group or simply because there was a "floor effect" for the group already relatively low in interest. It would be interesting to repeat the present experiment in a context avoiding such an artificial restriction of movement.

Finally, it is important to note that the award manipulation also had an immediate effect on children's performance during the experimental sessions. The pictures drawn by the children for the experimenter were rated on overall quality by three blind judges on a scale from 1 (very poor) to 5 (very good). Although the three conditions did not differ in the number of pictures drawn (2.61 for the expected-award, 2.44 for the unexpected-award, and 2.33 for the no-award children), the quality of pictures drawn in the expected-award condition was lower than in the other groups. The average quality ratings for the expected-award group (2.18) differed significantly from both the unexpected-award (2.85) and no-award (2.69) groups ($t = 3.01$, $p < .01$, and $t = 2.08$, $p < .05$, respectively). Thus the detrimental effects of the expected-award manipulation were apparent during the experimental sessions, as well as later in the classroom setting.

DISCUSSION

The present results indicate that it is possible to produce an overjustification effect. In the expected-award condition, children showed decreased interest in the drawing activity after having undertaken it in order to obtain a goal which was extrinsic to the pleasures and satisfaction of drawing in its own right. In the unexpected-award condition, on the other hand, children receiving the same extrinsic reward showed undiminished or increased interest in the activity. This detrimental effect of the expected-award procedure was manifest both in quality of performance during the experimental sessions and in subsequent unobtrusive measures of intrinsic interest in the classroom setting.

As an empirical proposition, the present findings have important practical implications for situations in which extrinsic incentives are used to enhance or maintain children's interest in activities of some initial interest to the child. Such situations, we would suggest, occur frequently in traditional classrooms where systems of extrinsic rewards—whether grades, gold stars, or the awarding

of special privileges—are applied as a matter of course to an entire class of children.

Many of the activities we ask children to attempt in school, in fact, are of intrinsic interest to at least some of the children; one effect of presenting these activities within a system of extrinsic incentives, the present study suggests, is to undermine the intrinsic interest in these activities of at least those children who had some interest to begin with. The quite limited manipulation employed in this study, involving a symbolic reward not unlike those routinely employed in the classroom, was sufficient to produce significant differences in the children's subsequent behavior in a natural preschool classroom. This is consistent with the complaint, from Dewey (1900) and Whitehead (1929) up to the time of Holt (1964) and Silberman (1970), that a central problem with our educational system is its inability to preserve the intrinsic interest in learning and exploration that the child seems to possess when he first enters school. Instead, these authors have suggested, the schooling process seems almost to undermine children's spontaneous interest in the process of learning itself.

At the same time, because the implications of this point of view for social control and socialization are potentially so great, it is important to point immediately to the hazards of overgeneralization from the present experiment. Certainly there is nothing in the present line of reasoning or the present data to suggest that contracting to engage in an activity for an extrinsic reward will always, or even usually, result in a decrement in intrinsic interest in the activity. The present experiment was carefully designed to allow a demonstration of the overjustification effect. The target activity was deliberately chosen to be highly attractive, and subjects were all children who actually manifested some intrinsic interest in the activity. Extrinsic incentives were superfluous. Under such circumstances, there is every reason to believe that it should be relatively easy to manipulate loss of interest and difficult to increase it above its already fairly high level.

The present experiment does not speak to situations which depart very greatly from the present situation. There is considerable evidence from studies of token-economy programs (Fargo, Behrns, & Nolen, 1970; O'Leary & Drabman, 1971) supporting the proposition that extrinsic incentives may often be used effectively to increase interest in certain broad classes of activities. On the present line of reasoning, this proposition should be particularly true when (*a*) the level of initial intrinsic interest in the activity is very low and some extrinsic device is essential for producing involvement with the activity; or (*b*) the activity is one whose attractiveness becomes apparent only through engaging in it for a long time or only after some minimal level of mastery has been attained. In fact, such conditions characterize the prototypical token-economy program in that tangible extrinsic rewards are *necessary* to elicit the desired behavior. Hence, it would be a mistaken overgeneralization from the present study to proscribe broadly the use of token-economy programs to modify children's behavior.

It has already been recommended by some thoughtful proponents of token economies that their use be limited to circumstances in which less powerful techniques have been tried and found inadequate (O'Leary, Poulos, & Devine, 1972)—in other words, only when they are necessary. It has also been stressed that in any case, the successful implementation of powerful reinforcement systems demands considerable sensitivity as well as ingenuity on the part of the practitioner (Bandura, 1969). The present study provides empirical evidence of an undesirable consequence of the unnecessary use of extrinsic rewards, supporting the case for the exercise of discretion in their application (O'Leary & Drabman, 1971).

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