

Consequences of Superfluous Social Constraints: Effects on Young Children's Social Inferences and Subsequent Intrinsic Interest

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Three studies investigated the effects of the imposition of a nominal contingency—the presentation of engagement in one activity as a means for earning the chance to engage in a second activity of equivalent initial interest—on children's subsequent intrinsic interest in and social inferences about the two activities. Across experiments, analogous contingency manipulations were presented in both a highly familiar context in which children had previously encountered such contingencies and a more novel context in which children had not previously encountered the use of such social constraints. Children in each of the studies showed some tendency to discount interest in the activity presented as a means relative to the activity presented as an end. Further evidence, however, suggests that these findings did not result from any reflective reliance on an abstract discounting principle. Implications for understanding the development of self-perception and social perception processes and for interpreting previous over-justification research are discussed.

Tangible rewards can serve many functions. They can be employed to control present behavior or to shape future performance. They can be offered as a payment for ser-

vices rendered, or they can be presented as a visible indication of superior performance. The multiple social meanings of the use of tangible rewards are reflected in our everyday distinctions among bribes and bonuses, incentives and salaries. Each of these usages implicitly suggests a different perspective on the use of rewards and a different context in which the receipt of reward may be considered. They carry different connotations concerning, for example, the likely conditions under which the reward was offered, the presumed motives of the person administering the reward, and the relationship between the agent and the recipient of the reward.

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The potential significance of these different perspectives from which the use of salient, tangible rewards may be examined has become apparent in the last few years in the growing literature indicating that inappropriate uses of extrinsic rewards may have unintended deleterious effects (e.g., Condry, 1977; Deci, 1975; Lepper, 1981; Lepper & Greene, 1978a; Lepper, Greene, & Nisbett, 1973). This literature suggests that the imposition of salient, but functionally superfluous, extrinsic constraints on a child's engagement in an initially interesting activity

may undermine the child's later intrinsic interest in that activity. Such adverse effects, moreover, appear to occur primarily under conditions in which the instrumentality of engagement in the activity as a means to some extrinsic end is made salient (Lepper, 1981, in press-b; Pittman, Cooper, & Smith, 1977; Johnson, Greene, & Carroll, Note 1).

These findings have been most commonly discussed in terms of the attributions that different reward procedures lead children to make concerning their reasons for having engaged in the activity (Deci, 1975; Kruglanski, 1975; Lepper & Greene, 1978b). Such accounts typically make use of what Kelley (1973) has termed a discounting principle: When salient extrinsic incentives or constraints appear to provide a plausible and sufficient reason for engaging in an activity, one is commensurately less likely to view that activity as intrinsically interesting in its own right. This account has proven of considerable value in generating empirical research. Predicted detrimental effects of superfluous tangible rewards on later intrinsic interest have been shown to occur, for example, across a wide developmental span—from preschool (e.g., Anderson, Manoogian, & Reznick, 1976; Boggiano & Ruble, 1979; Greene & Lepper, 1974; Lepper & Greene, 1975; Lepper et al., 1973; Loveland & Olley, 1979; Ross, 1975; Wells & Shultz, 1980) and elementary school levels (e.g., Boggiano & Ruble, 1979; Dollinger & Thelen, 1978; Greene, Sternberg, & Lepper, 1976; Karniol & Ross, 1977; Kruglanski, Alon, & Lewis, 1972; McLoyd, 1979; Ross, Karniol, & Rothstein, 1976; Sorenson & Maehr, 1976; Swann & Pittman, 1977) to high school (Harackiewicz, 1979; Kruglanski, Friedman, & Zeevi, 1971; Kruglanski et al., 1975) and college populations (e.g., Calder & Staw, 1975; Deci, 1971, 1972, 1975; Enzle & Ross, 1978; Folger, Rosenfield, & Hays, 1978; Pittman et al., 1977; Smith & Pittman, 1978).

At the same time the very success of these studies in demonstrating comparable results across this wide age range poses significant problems for any radical self-perception account of this phenomenon, in which principles of self-perception are hypothesized to mirror or derive from more general princi-

ples of social perception (cf. Kassin, 1981; Ransen, 1980; Wells & Shultz, 1980). In particular, other research examining children's social inferences about the motives of others (Karniol & Ross, 1976, 1979; Shultz & Butkowsky, 1977; Shultz, Butkowsky, Pearce, & Shanfield, 1975; Smith, 1975; Wells & Shultz, 1980) suggests that children below school age do not frequently draw social inferences about others in accordance with a discounting schema. Instead, young children will often employ an additive schema (i.e., the more the external pressures present, the more the person must like the activity). Although their overt actions frequently appear consistent with a discounting principle, young children seem not to employ this principle on any abstract or reflective level in their verbal reasoning about the motives and preferences of others. Children often seem, in short, to respond in a more adult fashion when they are themselves actors than when they are observers of another's actions and outcomes (cf. Hoffman, 1976; Piaget, 1932/1965; Wells & Shultz, 1980).¹

Although these seemingly conflicting findings present difficulties for a traditional self-perception account of previous overjustification (or insufficient justification) research with young children, it is possible to view both sets of results from a different perspective. Lepper and Greene (1978b; Lepper, 1981), for example, have suggested that the child's acquisition of an abstract inferential principle like discounting may be a

¹ In part young children's apparent lack of sophistication in these social perception tasks may stem from methodological difficulties inherent in the use of hypothetical verbal materials. Children who are presented with comparable situations in a more vivid and concrete fashion that reduces memory and processing demands might well respond in a more sophisticated fashion (cf. Chandler, Greenspan, & Barenboim, 1973; Kassin, 1981; Kassin, Lowe, & Gibbons, 1980; Shultz & Butkowsky, 1977), although at least some of the studies that have failed to find evidence of discounting effects among young children have employed some form of visual aids (e.g., Kun, 1977; Smith, 1975). Hence, given the available evidence, it seems unlikely that young children should be viewed as explaining their own actions using only inferential principles derived from more abstract principles of social inference that they have already acquired in learning to explain the behavior of others.

gradual and constructive process—that children may learn to expect a negative correlation between the amount of external pressure applied to induce a person to engage in a task and the person's likely intrinsic interest in that task by experiencing or observing specific negative relationships of this sort in a variety of concrete social situations. Only gradually, through their own experiences with and observations of the ways in which adults employ extrinsic incentives and sanctions, will children come to develop relatively abstract generalizations that serve to distinguish uses of external incentives to coerce people to undertake undesirable activities or to reward people for superior performances. At first, in this view, the interpretation that children place on particular social control procedures may vary dramatically as a function of the ease with which specific new experiences can be assimilated to familiar social settings and schemas. Only as the child's inventory of social experience is expanded will he or she be likely to employ more abstract distinctions (e.g., between work and play or bribes and bonuses) that adults commonly use to describe and differentiate experiences with external incentives that reflect either praise or constraint.

This progression from initially concrete social schemas to more abstract and reflective generalizations can be thought of in terms of the development of social scripts (Abelson, 1976; Abelson, Note 2)—that is, organized and coherent event sequences anticipated in the presence of particular situational cues that reflect an individual's expectations concerning apparent regularities in his or her social environment. From this viewpoint (Lepper & Greene, 1978b), relatively hypothetical or categorical scripts embodying a discounting principle (e.g., "When someone uses powerful incentives or sanctions to induce me to do something, the chances are that it is boring or unpleasant.") are derived through the abstraction of common features from sets of relatively more concrete and episodic social scripts (e.g., "When mom tells me I can't have my dessert until I clear my plate, what's left on my plate is usually yucky"; or "When dad says I have to finish some task before I can go out to play, that task is probably something I don't

want to do."). Similar processes of successive abstraction and generalization should also characterize the manner in which children acquire an understanding of the relationship between the receipt of performance-contingent rewards and one's competence or effort at an activity or the relationship between the motives of the person offering or administering the reward and the social meaning of that attempt at influence or control.

This analysis has two major implications. First, it suggests that young children need not possess an abstract and reflective understanding of the discounting principle to show discounting effects in particular concrete and familiar situations. Such a view is consistent with the developmental literatures considered earlier (Kassin, 1981; Wells & Shultz, 1980). Second, this approach suggests that the relative sophistication of children's responses to situations involving extrinsic incentives or other social constraints should depend much more substantially than those of adults or older children on the relationship between those situations and other settings in which the child has previously encountered comparable social control techniques. More specifically it suggests that the likelihood that young children will respond to the imposition of social constraints in terms of some discounting schema should depend on the extent to which their prior experiences with similar social control techniques have been frequently and uniquely associated with attempts to coerce them or others into engaging in activities of minimal inherent interest.

In the present experiments, therefore, we sought to explore children's responses to the imposition of one type of superfluous extrinsic constraint—the imposition of a means-end relationship on children's engagement in two qualitatively similar activities—hypothesized to be strongly related to previous experiences of external constraint. In the first of these studies, we considered children's social inferences regarding activities presented as either means or ends in the precise social context in which our subjects were most accustomed to encounter an extrinsic contingency of this sort. Our second study examined children's social inferences regarding the motives and interests of another

child who was presented with a conceptually analogous nominal contingency between engagement in two apparently similar activities, but in a novel context less similar to settings in which children were likely to have previously encountered such contingencies. Finally, our third study investigated children's own behavioral responses to the imposition of an analogous contingency on their own engagement in two activities of initially equivalent intrinsic interest—that is, their subsequent intrinsic interest in activities previously presented as means or ends.

Our primary interest in each of these studies lay in the extent to which children's reactions to the imposition of such a nominal contingency in these different contexts would show evidence that they had interpreted the situation in terms of either a specific discounting script or some more abstract and general discounting principle. In addition to this primary concern with the relative sophistication of children's responses to these different situations, the results of our final study—in which the effects of the imposition of a superfluous nominal contingency on children's own engagement in activities of initial interest were assessed—also promised to have important implications for our understanding of previous research on the adverse effects of extrinsic rewards on subsequent intrinsic interest.

Experiment 1

Our first experiment, then, sought to examine young children's responses to the imposition of a means-end relationship between two similar activities in a context that preliminary interviews had suggested would be almost universally familiar to preschool subjects—a setting one might term the *dinner table debate*. The social script enacted in this setting was clear and not unfamiliar to most parents and teachers: The child is told that he or she may not have one food (typically a dessert, candy, or ice cream) until he or she has first finished some other portion of the meal (typically the vegetables, entree, or milk). The seemingly ubiquitous character of this particular social constraint script suggested that it would provide a rea-

sonable starting point for our investigation of young children's early awareness of the implicit meaning of social control attempts.

We therefore asked children to make judgments concerning their expectations about the likely attractiveness of two hypothetical foods, for themselves and for another hypothetical child, under one of two conditions. In the means-end condition the adult presenting these new foods imposed a nominal contingency between them—that is, one had to be eaten before the other could be tried. In the control condition the same two foods were presented without the interposition of any external contingency.

Method

Subjects. The subjects were 28 preschool children, 17 boys and 11 girls, with a mean age of 4 years 5 months, attending the Bing Nursery School on the Stanford University campus.² Sixteen children were randomly assigned to the experimental means-end condition; 12 to the control condition.

Procedure. Children were approached individually in their classrooms by an adult experimenter and were asked if they would listen to a short story and answer questions about it. Twenty-eight of 30 children who were approached agreed to do so. These children then accompanied the experimenter to a corner of the classroom or playground where the procedure would not be interrupted or overheard by other children.

Children were then told that the story concerned Johnny (or Janie), whose mother had just brought home two new foods, "hupe" and "hule," that Johnny (Janie) had never tried before. In the means-end condition the protagonist's mother introduced the two new foods in a contingent fashion, indicating that the child had to finish, for example, his or her hupe before he or she could have the hule. In the control condition no such external contingency was imposed between the two foods. The mother simply offered the child first the hupe and then the hule. Within both conditions the presentation of the two food names was counterbalanced.

After the experimenter ascertained that the child had understood and could repeat the basic elements of this brief story, the child was asked which of the two foods he or she thought that Johnny (Janie) would like better and why, and which food the subject himself or herself would like better and why. Since the two questions yielded identical results, only responses to the social judgment question will be reported.

² To avoid potential reactive effects from participation in more than one related study, different samples of children participated in our preliminary interviews and in each of the three experiments reported. In none of these studies, moreover, was there any interaction of sex of subject with experimental treatments. Hence data were collapsed across this dimension for purposes of analysis and presentation.

Results and Discussion

The implicit meaning of the imposition of a nominal contingency on a child's choice of foods, even in the absence of any specific information about the foods involved, was not lost on our preschool subjects. In the means-end condition 12 of 16 subjects (75%) indicated that the protagonist of the story would prefer the food presented as an end to the food presented as a means. In the control condition only 2 of 12 subjects (16.7%) indicated that the protagonist would prefer the food presented second to the food that had been presented first in the absence of any contingency (5 thought the first would be preferred, and 5 others were adamant in insisting that they could not tell or did not know). This difference in children's inferences in the two conditions was highly significant, $\chi^2(1) = 9.67, p < .01$.³

This quantitative analysis is supported and extended when children's reasons for their choices are examined. Within the means-end condition 10 of the 12 children who said that the other child would prefer the food that filled the dessert slot indicated that they believed that it would be sweeter, taste better, or have sugar in it. In the two more ambiguous cases, subjects indicated that they thought that the child would like it more, but they said that they did not know why. More impressively even those experimental subjects who said that the child would prefer the item that filled the entree/vegetable/milk slot all gave reasons that indicated an awareness of the underlying social script. These four children suggested that the first food had "more vitamins," "more minerals," no "refined sugar," or that it was "full of meat." By contrast, children in the control condition, even if they gave a choice of one food or the other, would only say that the protagonist "liked it" or that they did not know—a quite sensible response in the absence of any relevant information or applicable social script.

Thus in this very familiar social context, similar to everyday situations in which children have previously had external constraints imposed on their choices, these preschool children seemed well aware of the hidden agenda that often underlies the use

of such constraints and responded accordingly. In the experimental condition both children's choices and the reasons they gave for those choices indicated that they regularly inferred that the item presented as a means would be less attractive (on conventional grounds of sweetness of taste) than the item presented as an end. The different responses of control subjects, moreover, demonstrate that these choices were indeed a function of the contingency imposed.

Experiment 2

This initial study, then, indicated that the imposition of a nominal contingency on children's choices in a hypothetical situation, patterned closely on a familiar social setting, will produce inferences about the attractiveness of choices presented as means versus ends that would follow from the application of a concrete discounting schema (i.e., the food I "have" to eat is less attractive than the food I am "allowed" to eat). These data do not themselves establish that children's inferences in this specific context were based on principles any more general than these subjects' knowledge of the manner in which parents typically invoke contingencies at mealtimes. The relative ease with which children seemed to recognize this potentially prototypic social script, however, suggested that similar effects might also be obtained if children were exposed to a conceptually analogous manipulation in situations considerably further removed from the precise contexts in which children had previously encountered social constraints of this sort. As a result Experiment 2 was designed to examine the generality of the findings obtained in Experiment 1 in a less common and less familiar situation.

In Experiment 2, children were confronted with a conceptually analogous contingency manipulation, but one presented in a context in which they would be unlikely to have previously experienced or observed the use of such a contingency procedure. Specifically subjects in our second study were exposed to a story concerning another child who had

³ All *p* values reported in this article are based on two-tailed tests of significance.

been asked by an adult to engage in two apparently attractive art activities. Half of the children were presented with an experimental means-end version of this story, in which the protagonist was told that he or she first had to engage in one art activity to win the chance to engage in the other. Half were confronted with a control version, in which no such nominal contingency was imposed on the protagonist. Subsequently subjects were asked to answer a number of questions concerning the protagonist's liking for the two activities and to indicate the reasons underlying their responses.

Method

Subjects. The subjects were 40 preschool children, with a mean age of 4 years 5 months, enrolled in the Bing Nursery School. The sample included 16 males and 24 females, all of predominantly middle-class backgrounds. Subjects were assigned randomly within sex to conditions.

Procedure. Children were escorted individually to a research room associated with the nursery school and were told that they were going to watch a slide show. They were then seated next to a child-sized table containing a carousel projector and a cassette tape recorder, which were used to present the stimulus story and the dependent measures to the children in a fashion designed to minimize experimenter bias or experimental demand characteristics.

Each child was shown one of two prepared slide shows in which another child was asked to engage in two highly similar drawing activities under one of two conditions. Means-end subjects witnessed the child being told that the opportunity to engage in one of the activities could be won only by first engaging in the other activity; control subjects saw this other child engage in the same activities without any contingency between the two. Each slide show lasted approximately 6 minutes and consisted of an identical series of slides accompanied by a tape-recorded narrative appropriate to the subject's condition. This method of presentation maximized experimental control. It was also expected to minimize difficulties that young children may experience in responding to purely verbal and hypothetical stimulus materials by presenting the relevant material in a vivid, realistic, and involving fashion (Chandler, Greenspan, & Barenboim, 1973; Hoffman, 1976; Kassin, 1981; Kassin, Lowe, & Gibbons, 1980; Lepper, 1981; Shultz & Butkowsky, 1977).

Dependent measures. Following this slide show children were asked a series of questions to insure that they could accurately recall the essential elements of the story. A small number of children who failed to recall critical elements of the story had the story repeated to them. Subsequently all children were asked a series of questions concerning their inferences about the protagonist's preferences concerning the two activities.

First, the children were asked to indicate which of

the two activities the protagonist liked better and which of the activities this other child would choose to do, if given a free choice. After the children had responded in each case, they were asked why they thought so. It was stressed that the experimenter was simply interested in what children thought of the story and that there were no right answers to these questions. If subjects, when asked to explain their choices, answered "because" or "I don't know," they were prompted to elaborate or take a guess. Finally, subjects were also asked to rate each of the two activities on a 4-point visual scale—consisting of schematic faces wearing a frown, a neutral expression, a slight smile, and a wide grin—by pointing to the face that best illustrated how much the protagonist would like each activity. Pretraining with highly liked and highly disliked activities insured that subjects understood the use of this scale. The questions were prerecorded, and the experimenter intervened only when subjects' answers were unclear or the subject required further prompting. Subjects' answers were recorded and subsequently were transcribed by a judge who remained blind to subjects' experimental conditions. At the completion of these questions, the children were thanked for their help and returned to their classrooms.

Results and Discussion

Several measures of children's inferences about the preferences and interests of the protagonist in the story were available in this study. First, children were asked direct comparative questions, as in Experiment 1, concerning which of the two activities they thought that the protagonist would like better and which of the two they thought that he would play with on his own. Children's perceptions of the protagonist's liking for the two activities yielded a strong effect paralleling the results of our first study: Ninety percent of subjects in the means-end condition, but only 45% of the subjects in the control condition, indicated that they believed that the protagonist would prefer the activity presented second (the end) to the activity presented first (the means), $\chi^2(1) = 9.23, p < .01$. Similar but less powerful results were obtained for the question asking which activity the protagonist would play with: Here 75% of subjects in the means-end condition, versus 55% of subjects in the control condition, indicated that the protagonist would play with the activity presented as an end rather than the one presented as a means, $\chi^2(1) = 1.76, p < .10$. Combining these two questions, 65% of means-end subjects, compared to 30% of control subjects, gave responses that indicated a consistent

inferred preference for the second activity to the first, $\chi^2(1) = 4.91, p < .05$.

In contrast to the results obtained in Experiment 1, however, children's explanations of their answers in this study provided little evidence of any verbalizable principle underlying their choices. Although the children's choices were strongly and systematically influenced by the imposition of a nominal contingency, a vast majority of children's justifications for these inferences involved only a restatement of the protagonist's greater liking for one activity or the other, or a statement that the child did not know. Only four subjects in the means-end condition gave justifications that made reference to the prior contingency; three subjects in each condition suggested that the protagonist would prefer to play with the first activity because he had done so "first" before; and two subjects in each condition gave idiosyncratic reasons for their responses (e.g., "so his friend could draw with the others").

In addition to these questions calling for a direct comparison of the two activities, children were asked to rate each of the two activities independently, using the visual rating scale described above. The results from this measure are presented in Figure 1. A 2×2 analysis of variance was computed on the data, with experimental condition as a between-subjects factor and activity order as a within-subjects factor. This analysis yielded a marginally significant interaction, $F(1, 38) = 3.72, p < .07$. Neither main effect approached significance. Subjects in the means-end condition inferred significantly less interest by the protagonist in the activity presented as a means than in the activity presented as an end, $t(18) = 2.76, p < .02$. Within the control condition the pattern of results was nonsignificantly reversed ($t < 1$). Individual comparisons of the ratings of each activity across experimental conditions were also examined. Neither separate effect, however, reached statistical significance: for Activity 1, $t(38) = 1.23, p < .25$; for Activity 2, $t(38) = 1.99, p < .10$.

This second experiment, then, examined children's social inferences concerning the interests and preferences of another child whose actions had been constrained by the

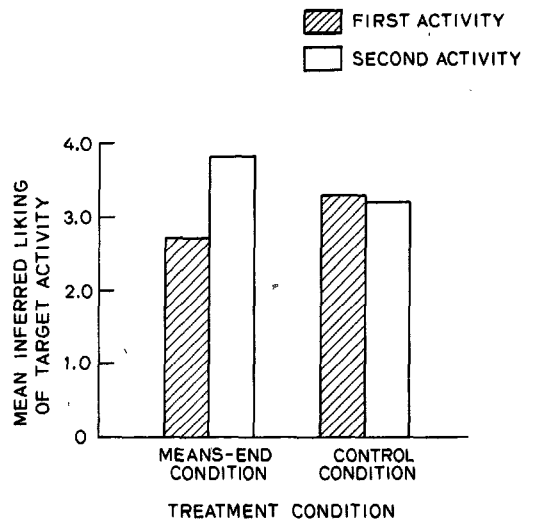


Figure 1. Mean inferred liking of the two experimental activities by the protagonist, by condition, Experiment 2.

imposition of a nominal contingency analogous to that employed in Experiment 1, but in a novel situation in which subjects had not previously encountered contingencies of this sort. In general the results parallel those reported in our initial study. Even in this hypothetical and unfamiliar social context, children in the experimental condition seemed to infer that another child would prefer an activity presented as an end to one presented as a means. Although both their responses to comparative questions and their ratings of the two activities were systematically influenced by the nominal contingency procedure, children's justifications of their responses provided no evidence of any abstract and reflective discounting principle underlying those choices.

Experiment 3

In Experiment 1 we investigated young children's responses to the imposition of a nominal contingency between two activities in a social context in which the use of such techniques would be highly familiar and assessed children's own preferences between the two activities and their inferences about the likely preferences of a hypothetical other. In Experiment 2 we examined children's social inferences about the preferences of another child confronted with two

similar activities presented in a means-end relationship in a context with which children were expected to have had little previous experience. In both cases children's responses suggested a relative devaluation of the activity they or another had been obliged to undertake.

One interesting implication of these findings has particular relevance for previous research regarding overjustification phenomena—that if children were themselves confronted with an analogous nominal extrinsic contingency imposed on their own actions, they might come to find the activity presented and undertaken as a means to be of less actual subsequent intrinsic interest to them in the later absence of further external constraints or contingencies. Such a finding, paralleling the detrimental effects of undertaking an activity of initial interest to obtain an extrinsic reward, moreover, would be of considerable theoretical interest. If the two activities presented as means and end were of equal initial value to subjects, finding a decrease in subsequent intrinsic interest in the activity presented as a means would provide strong evidence against interpretations of comparable effects in previous studies in terms of frustration, distraction, or a contrast in the values of the activity and the reward.

Our third experiment examined this possibility by investigating the effects of the imposition of a nominal contingency on children's later intrinsic interest in two activities of equally high initial interest. The procedure conceptually paralleled that employed in our second experiment, but in this case the external constraint was directly imposed on subjects' own actions. Thus in a means-end condition, children were told that they could win a chance to play with one drawing activity (the end) by working first with another drawing activity (the means). In a control condition children were simply asked to draw with one activity first and with the other second, in the absence of any contingency between the two. Several weeks after these experimental sessions, unobtrusive measures of subjects' intrinsic interest in both activities were obtained in the children's regular preschool classrooms in the absence of any further external constraints

on their choices. Our primary interest lay in an examination of the effects of presenting the target activities as either means or ends on children's later intrinsic interest in the two activities.

Method

Subjects and experimental setting. The subjects for this third experiment were 64 preschool children enrolled at the Bing Nursery School. The sample consisted of 30 boys and 34 girls of predominantly middle-class backgrounds, with a mean age of 4 years 6 months. An additional 4 subjects were absent from school when the final classroom measures were taken, and 4 other subjects were lost due to procedural errors. Subjects were randomly assigned to conditions.

The study was conducted at the nursery school in classrooms equipped with large one-way mirrors and sound equipment. In these classes the preschool program was by intention relatively unstructured, with considerable free-play time in which children were allowed and encouraged to choose among a variety of both continuously and periodically available activities. This setting allowed the introduction of experimental activities into the ongoing nursery school program by the nursery school teachers, without any intrusion into the classroom by researchers—a situation wherein children's responses to these activities could be unobtrusively observed and recorded.

Experimental materials. The design required two similar experimental activities of high and approximately equal initial interest to subjects. Following extensive pretesting, two drawing activities were selected that met these criteria: felt-tipped magic marker pens and artist's oil pastel crayons. Evidence from the post-experimental classroom measures confirmed that these choices were appropriate. Across subjects the average proportions of time spent with the two sets of materials were virtually identical; therefore, for purposes of subsequent analysis, the two activities were treated as interchangeable.

Experimental sessions. For the experimental sessions children were escorted individually by a first experimenter to one of the research rooms associated with the nursery school. To counterbalance for potential individual activity preferences despite the generally equal attractiveness of the two sets of materials, subjects were asked by the first experimenter to indicate a preference of activity by ranking the two target activities along with several incidental drawing activities by a method of elimination. When the child had finished this ranking procedure a second experimenter entered the room and was introduced to the child. The first experimenter then excused himself and left the room, and the child was escorted to a child-sized table on the other side of the room by the second experimenter. Within each condition half of the subjects were asked to draw first with the activity they had ranked higher and half to draw first with the activity they had ranked lower.

In the means-end condition the experimenter produced one of the two target activities (the end) and asked the child if he or she would like to draw some

pictures with those materials. When the child assented the experimenter placed the activity on the table, produced the other set of target materials (the means), and said to the subject, "Okay, now I'm going to let you win a chance to draw with the [end], and the way you can win a chance to draw with the [end] is to draw two pictures for me with the [means]." In the control condition the experimenter produced both sets of target materials simultaneously and asked the child if he or she would like to draw some pictures with them. When the subject assented the experimenter placed the activities on the table and said to the subject, "Okay, now I'd like you to draw two pictures for me with [Activity 1] and two pictures for me with [Activity 2]. We'll start with [Activity 1], so I'd like you first to draw two pictures with the [Activity 1]." The only difference between the two conditions, therefore, was that in the means-end condition the subject was told that he or she had to win a chance to draw with the second set of materials by drawing with the first set of materials; in the control condition the subject was told simply that he or she would draw with one set of materials first and the other set of materials second.

The subject was allowed up to 6 minutes to draw two pictures with the first activity. When the child was finished in the means-end condition, the experimenter said, "All right. You drew pictures with the [means]. Now you have won a chance to draw two pictures with the [end]." In the control condition the experimenter said, "All right. Now let's draw two pictures with the [Activity 2]." The child was again allowed up to 6 minutes to draw two pictures with the second activity. As the child was drawing pictures with both activities the experimenter showed interest in, but neither approval nor disapproval of, the child's efforts. When the child had finished both sets of pictures, he or she was thanked and escorted back to the classroom.

Dependent measures. Two sets of dependent measures were obtained in this experiment—measures of subjects' performance at the two activities during the individual experimental sessions and measures of subjects' subsequent intrinsic interest in the two sets of materials in their classrooms. During the experimental sessions measures were taken of the amount of time the subject spent with each of the two activities by a blind observer behind a one-way mirror. In addition, the pictures subjects drew with both sets of drawing materials were later rated by blind judges on a 5-point scale of overall quality. As in previous studies the reliability of these quality ratings across independent judges proved quite high ($r = .90$).

Two to 3 weeks following the close of the experimental sessions, measures of subsequent intrinsic interest in the two target activities in the children's classrooms were obtained in the absence of further external pressures or contingencies. The average interval between the experimental sessions and the start of classroom measurements was 18 days. Following the procedure established in earlier studies (e.g., Lepper et al., 1973), the two experimental activities were placed on two separate tables by the classroom teachers for the first hour of three consecutive class sessions, as if they were simply two among a number of periodic activities chosen by the teachers on each day. When the experimental materials were available, the teachers and other adults in class

were asked not to sit at the target tables. Otherwise the teachers behaved normally, and the children were free to choose among the two target activities and the wide variety of 30 or 40 other activities available to them in their classrooms. Unobtrusive measures of the amount of time each subject spent with each of the two activities were recorded by observers, blind to subjects' conditions, from behind a one-way mirror. These measures showed high reliability across observers ($r = .94$). Since it was important to establish that the amount of time allotted to these three sessions was sufficient to allow independent measurements of the children's interest in the two activities, a correlation was computed on the amount of interest subjects showed in the two activities in the classroom. This correlation, as expected, did not approach significance and was in fact slightly positive ($r = .15$), indicating that engagement in one of the two activities did not preclude engagement in the other as well.

Results and Discussion

Preliminary analyses revealed no interaction of sex of subject with experimental condition and, as indicated earlier, no effect or interaction of the particular materials with condition. The data were therefore combined across these dimensions. Additional analyses yielded no significant differences on any measure between subjects who engaged first and those who engaged second in the activity they had initially ranked higher; nor was there any interaction between these stated preferences and experimental condition. Collapsing across this dimension as well yielded a two-cell design—means-end versus control—in which data were available on each subject's performance during the experimental sessions and his or her subsequent intrinsic interest in the classroom in each of the two drawing activities.

Classroom measures. The data of principal interest are the proportions of time spent by subjects with each of the two target activities in their classrooms several weeks following the experimental sessions. These data, following a log transformation ($Y' = \ln(Y + 1)$) to homogenize treatment variances (Winer, 1971), are presented in Figure 2. A 2×2 analysis of variance was performed on these data, with experimental conditions (means-end vs. control) as a between-subjects factor and activity order (Activity 1 vs. Activity 2) as a within-subjects factor. This analysis confirmed the pre-

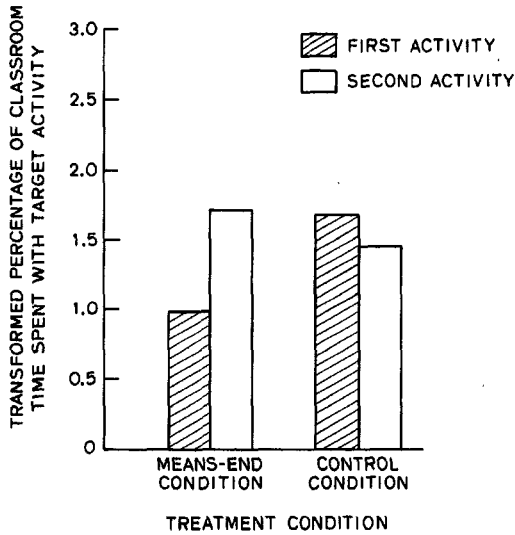


Figure 2. Mean intrinsic interest in the two experimental activities during postexperimental classroom observations, by condition, Experiment 3.

dicted interaction of activity order with experimental condition, $F(1, 62) = 5.61, p < .05$; neither main effect, however, approached significance. The specific nature of the interaction is apparent in Figure 2. In the means-end condition, subjects showed significantly less subsequent interest in the activity that they undertook first (the means) than in the activity that they undertook second (the end), $t(28) = 2.63, p < .02$; whereas in the control condition there was no difference in subjects' subsequent interest in the two activities ($t < 1$), and the means were in fact slightly reversed. Stated differently, subjects' subsequent interest in the first activity was significantly lower in the means-end than in the control condition, $t(62) = 2.04, p < .05$, whereas interest in the second activity was not different in the two groups ($t < 1$). These findings clearly parallel closely the results obtained in Experiment 2.

Experimental room measures. As with the classroom measures, a series of 2×2 analyses of variance was performed on the data collected during the experimental sessions in the experimenter's presence: the amount of time spent and the quality of the drawings produced with each of the two sets of materials. By contrast with the classroom data, these analyses yielded no significant effects. In the means-end condition subjects

spent an average of 3.30 minutes on the first activity and 3.43 minutes on the second activity, and the average picture quality for these two sets of materials was 2.86 and 2.93, respectively; in the control conditions subjects spent an average of 2.90 minutes on the first activity and 3.39 minutes on the second, and the average picture quality for the two sets of materials was 3.04 and 3.06. In none of these analyses did either of the main effects or the interaction of condition with activity order approach significance (all $F_s < 1$).

These data, it should be noted, argue against any theoretical account that relies on performance differences during the treatment period to explain subsequent between-condition differences in classroom interest measures. Because the implications of these negative findings are not trivial, it is important to make clear that it is not the case that the measures employed are simply insensitive. Performance measures identical to those employed in the present study, for example, have shown significant treatment effects in previous studies in which drawing activities have been presented as a means to a highly attractive tangible reward (Greene & Lepper, 1974; Lepper et al., 1973). The present lack of performance effects, however, is not unexpected. Across a much larger sample of studies, it appears that the observation of immediate performance deficits (or performance improvements) during the treatment period in which extrinsic constraints are present depends on the specific nature of the contingency and the activity employed much more precisely than do later decrements in intrinsic interest (cf. Lepper, 1981; Lepper & Greene, 1978b, for more extended discussions of these issues). Considering only those studies that have employed drawing activities, for example, detrimental performance effects seem likely to occur only when the contingency for receipt of reward remains unspecified: Under these circumstances children working in the presence of extrinsic constraints tend to draw more pictures, but pictures that are on the average of lower quality (Greene & Lepper, 1974; Lepper et al., 1973).

Summary. In this third experiment, then, the imposition of a nominal contingency on

children's engagement in two activities of high and equal initial interest produced a significant decrease, relative to appropriate control procedures, in later intrinsic interest in the activity presented as a means but a nonsignificant increase in subsequent interest in the activity presented as an end. These effects, moreover, appeared to be a direct result of the contingency manipulation and not simply a function of differences in children's performance at the two activities during the experimental sessions. These findings conceptually parallel and significantly extend the results of our second study. Confronted with a familiar social control technique in a novel and personally involving setting, children responded to the imposition of a superfluous external contingency in a manner suggesting that they found the activity that they had been constrained to engage in less inherently attractive than the activity that they had been allowed to engage in as a reward.

General Discussion

These three studies examined children's reactions to the imposition of a nominal contingency between engagement in two activities of comparable initial value. Experiment 1 examined children's inferences about the preferences of a hypothetical child (or themselves) in a highly familiar setting in which subjects had themselves had previous experience with similar social constraints. In this context all of the children seemed aware of the frequent implicit meaning of the imposition of such an extrinsic contingency. They inferred the constrained activity to be less attractive than the unconstrained activity and explained their inferences with reference to a concrete and familiar social script. In Experiments 2 and 3 we considered children's reactions to the imposition of analogous contingencies on the actions of another child and on their own actions in a less familiar context. In Experiment 2 when subjects were asked to infer the motives and interests of another child who was told that he had to complete one activity to engage in the other, their responses to specific questions yielded results that generally paralleled those obtained in the first experiment. Their explanations for their answers, however, dis-

played little evidence of any reflective awareness of an abstract principle linking the imposition of external constraints to the inherent attractiveness or unattractiveness of the activity. In Experiment 3 experimental subjects were themselves told that they had to complete one activity to obtain the opportunity to engage in the other. These children showed significantly less subsequent intrinsic interest in the activity presented as a means and nonsignificantly more interest in the activity presented as an end than did control subjects.

These experiments speak to two general sets of issues. Taken together they provide evidence of some relevance to developmental issues raised by previous research concerning the manner in which children come to understand the social meaning of externally imposed constraints and to apply that understanding in interpreting attempts to control their own actions or those of others. In addition, the results of our third experiment, in which the imposition of a purely nominal contingency on children's actions produced effects analogous to those obtained when an activity is made a means to some extrinsic reward, have some potentially important implications for our understanding of the conditions under which superfluous extrinsic constraints may undermine subsequent intrinsic interest.

Developmental Considerations

From a developmental perspective perhaps the most noteworthy result in the present studies lies in the relative sophistication of children's answers to the specific social attribution questions posed in our second experiment. In particular these results contrast with previous findings indicating that preschool children will not typically employ a discounting principle or schema in making social inferences about the motives of hypothetical others in unfamiliar contexts (e.g., Karniol & Ross, 1976; Smith, 1975). Comparatively, the present findings provide a reasonably clear illustration of one social context in which young children do seem to draw systematic social inferences about others in accord with a discounting model, although these same children appeared unable

or unwilling to verbalize the principle underlying their choices in any general terms.⁴

This discrepancy in findings, we have suggested, may stem from the relatively close connection in children's prior experience between adults' uses of the sort of nominal contingency procedure examined in the present study and situations that have involved the experience of constraint and the perception of adult manipulative intent (Lepper, 1981). Children, for example, encounter tangible rewards in many contexts—only some of which would warrant the application of a discounting principle or schema. Rewards may be presented as bribes to induce one to engage in unpleasant activities or as bonuses for work well done; they may be presented in a contractual fashion or unexpectedly. Learning a general principle that contracting to engage in an activity to obtain a tangible reward typically implies that the activity in question is not of high intrinsic interest may pose a complex conceptual task for the child. By contrast, children's previous experiences with means-end contingencies of the sort examined in the present study are likely to have been closely tied to contexts in which issues of external constraint were salient. Learning the social lesson that the use of such contingencies generally implies that the activity presented as a means is less attractive should therefore precede the acquisition of more complex and differentiated principles regarding the social meaning of different uses of tangible extrinsic rewards.

This general line of argument might also help to explain the finding that young children seem more likely to discount another's interest in a constrained activity when the external constraint involves threat of punishment than when it involves the offer of tangible rewards (Karniol & Ross, 1976). Again, the relatively greater range of situations in which rewards are likely to be employed and the multiplicity of ways in which rewards are typically presented, relative to threats of punishment, may provide a considerably more complex conceptual task for the child as well as the psychologist (Lepper, 1981; Lepper & Gilovich, 1981). Additional research explicitly comparing children's reactions to different forms of social control as a function of differences in their previous

experiences with such control techniques would help to clarify the further implications of this argument.

Implications for Overjustification Research

In addition to these developmental issues, there are some specific implications of the results of our third study that are relevant to interpreting previous research on overjustification. Clearly the detrimental effect on subsequent intrinsic interest produced in this study—when children were asked to engage in one activity of initial interest to obtain a chance to engage in another activity of equivalent initial interest—parallels the detrimental effects produced in previous studies in which children have been asked to engage in activities of initial interest to obtain some attractive tangible reward. This effect was obtained, moreover, in the absence of any difference in the inherent value of the putative means and ends that might be posited to produce frustration, distraction, or contrast effects that might have independently affected subsequent intrinsic interest. The effect occurred as well in the absence of differences in immediate performance during the experimental sessions. These findings, combined with data illustrating comparable detrimental effects of unnecessarily close adult surveillance (Lepper & Greene, 1975) or the imposition of unneeded temporal deadlines (Amabile, DeJong, & Lepper, 1976), suggest strongly that the effects observed in overjustification research are the result of the imposition of superfluous extrinsic constraints on children's actions, not a specific function of the use of tangible rewards per se.

It is worth noting that in this third study the decrease in interest in the activity presented as a means was significant, relative to control condition levels, whereas the in-

⁴ On this more abstract level, our subjects seemed to "know more than they could tell" (Polanyi, 1958). We should note, however, that the basic issue here concerns the accessibility or verbalizability of children's theories about social behavior. The argument does not address the more subtle and complex issues raised by Nisbett and Wilson (1977) regarding the accessibility and accuracy of introspective reports regarding the causes of our own actions.

crease in interest in the activity presented as an end was not significant. In fact this is precisely the pattern of results predicted by a strict discounting analysis. Yet one might also expect, if children fully understood the latent meaning of such a contingency, some increase in interest in the task presented as a reward—that is, an augmentation effect (Kelley, 1973). Just as structuring an activity as a required task may decrease its potential attractiveness, presenting an activity as a reward might be expected to increase its potential attractiveness. Perhaps our failure to find a significant enhancement of interest in the activity presented as an end was no more than the result of a simple ceiling effect. By selecting two activities of high intrinsic interest to subjects at the outset, we may have created a situation in which it was much easier to produce decreases than increases in later interest. Whether intrinsic interest in a task of lower initial attractiveness could be significantly enhanced by presenting it as a reward to be earned or won by engaging in some other activity remains an interesting issue for further research.⁵

Finally, it is worth noting that an examination of the particular theoretical question that Experiment 3 posed required us to place children in what may appear to be an unusual situation. Rarely, one might argue, are children asked to work for nominal extrinsic rewards of no greater value to them than the activity those rewards are intended to reinforce. But perhaps this situation is not as ecologically unrepresentative as it may appear. In many institutional settings ostensible incentive systems may be applied to groups of people without concern for individual differences in the attractiveness of these incentives. In many classrooms, for example, students are expected to find good grades or the opportunity to earn special privileges (e.g., dusting erasers or washing the blackboard) rewarding. Yet for many individual students, such rewards may have little objective value as incentives or sanctions (Dreeben, 1968; Holt, 1964; Jackson, 1968). Presenting these students with activities that they would otherwise find to be of inherent interest as means to such further ends could have an ironic effect. Under these circumstances the imposition of even a sys-

tem of objectively powerless contingencies could further decrease any initial intrinsic interest these children might have had (cf. Lepper, in press-a; Silberman, 1970).

⁵ Recent experiments by Birch and her associates (Birch, 1981; Birch, Birch, Marlin, & Kramer, Note 3; Birch & Marlin, Note 4) provide some fascinating and particularly pertinent data on this issue. Studying contextual manipulations that affect preschool children's actual food preferences, Birch and colleagues have been able to demonstrate both a decrease in children's preferences for foods presented as means to some external end (i.e., access to attractive play activities) and an increase in children's preferences for foods presented as a reward (i.e., contingent on certain classes of social responses).

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Manuscripts Accepted for Publication in the Section Attitudes and Social Cognition

- Self-Serving Biases in Attribution: A Bayesian Analysis.** Christopher Wetzel (Department of Psychology, University of Mississippi, University, Mississippi 38677).
- Relative Importance of Prior and Immediate Events: A causal primacy effect.** Amiram Vinokur (Research Center for Group Dynamics, Institute for Social Research, University of Michigan, Ann Arbor, Michigan 48106) and Icek Ajzen.
- Causal Schemata—Review and Criticism of Research on a Popular Construct.** Klaus Fiedler (Fachbereich Psychologie, Justus-Liebig-Universitaet Giessen, Otto Behaghel-Strasse 10, D-6300 Giessen, West Germany).
- Patient Behavior in Hospitals: Helplessness, Reactance or Both?** Charles S. Raps, Christopher Peterson (Department of Psychology, Virginia Polytechnic Institute, Blacksburg, Virginia 24061), Marita Jones, and Martin E. P. Seligman.
- Covariation Information and Cognitive Processing: The Effects of Causal Implications on Memory.** Richard Sherman (Department of Psychology, Miami University, Oxford, Ohio 45056) and William Titus.
- Where Leading Questions Can Lead: The Power of Conjecture in Social Interaction.** William B. Swann (Department of Psychology, University of Texas, Austin, Texas 78712), Toni Guiliano, and Daniel Wegner.