

## Turning Play into Work: Effects of Adult Surveillance and Extrinsic Rewards on Children's Intrinsic Motivation

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Preschool children engaged in a novel activity in individual sessions. In the expected reward conditions, subjects expected to win a chance to play with highly attractive toys by engaging in the activity; in the unexpected reward conditions, subjects had no prior knowledge of this reward. Orthogonally, subjects in the surveillance conditions were told that their performance would be monitored via a television camera; while subjects in the nonsurveillance conditions were not monitored. Two weeks later, unobtrusive measures of the subjects' intrinsic interest in the activity were obtained in their classrooms. Two significant main effects were obtained reproducing and expanding findings from earlier studies. Subjects who had undertaken the activity expecting an extrinsic reward showed less subsequent interest in the activity than those who had not expected a reward, and subjects who had been placed under surveillance showed less subsequent interest than those not previously monitored.

A necessary corollary to the systematic use of contingent extrinsic incentives by one person to modify or control the behavior of another is surveillance, the constant or periodic monitoring of a "subordinate's" behavior by a "supervisor" with power or authority over him. Hence, any comprehensive account of the dynamics and empirical consequences of explicit contingency systems ultimately has to include an analysis of the effects of surveillance, as well as the effects of the incentives themselves. As a method of providing data for the continuing evaluation of performance, surveillance is a practice common to a vari-

ety of everyday settings, including schools (Silberman, 1970), industry (Homans, 1950), and custodial or "total" institutions (Goffman, 1961). Yet despite its prevalence in our society, the consequences of surveillance outside of the immediate situation in which it occurs have received surprisingly little study.

One perspective which has stimulated research in this area, however, has been attribution theory (Bem, 1967, 1972; Kelley, 1967, 1973), which suggests that the use of surveillance and powerful extrinsic incentives may, in some cases, have unintended and possibly adverse effects upon both the supervisor who maintains surveillance over another and the subordinate who is placed under surveillance. Consider, for example, the effects of rewards and surveillance on the person placed in the role of supervisor over another. Strickland (1958) and others (Kipnis, 1972; Kruglanski, 1970) have conducted a series of intriguing studies which demonstrate an attributional cycle in which surveillance produced distrust of a subordinate's motivations, which in turn produced further surveillance.

In Strickland's (1958) classic study, subjects were asked to serve as supervisors simultaneously over two subordinates. During an initial work period, the supervisor was allowed relatively high surveillance over one of the subordinates and relatively low surveillance over the other worker, together with the

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power to reduce wages for inadequate work on supervised trials. Although in the end both workers had performed equally well at the task, this variation in the amount of surveillance had profound effects on the supervisor's attributions concerning the two subordinates' motivations. Relative to the subordinate under low surveillance, the supervisors in this study saw the high-surveillance subordinates as motivated primarily by the surveillance itself, and hence as less internally motivated, less trustworthy, and less likely to perform adequately in the absence of surveillance. Thus, when subsequently given a choice of which subordinate to monitor, subjects chose more often to monitor the previously monitored subordinate, bringing the process full circle.<sup>1</sup>

On the other side of the coin, from the perspective of the subordinate in such a situation, self-perception theory (Bem, 1967; 1972) suggests that a fundamentally similar attribution process may well occur in the subordinate's perceptions of his own behavior, leading him ultimately to fulfill the supervisor's low expectations of him. To the extent, the theory suggests, that a person observes himself engaging in an activity in a situation in which extrinsic pressures to do so are strong and salient, he, like others, attributes his own behavior to the extrinsic pressures in the situation and comes to see himself as lacking any intrinsic interest in the activity or any intrinsic motivation to perform well. Hence, if a person is asked to undertake a task under conditions of strong external pressure, the theory suggests that any initial intrinsic interest the person may have had in that activity is undermined by this pressure, and that when a person is subsequently pre-

sented with the same activity in the absence of strong external forces, he is less likely to choose to engage in the activity.

This "overjustification" hypothesis—that the use of overly sufficient extrinsic pressures decreases subsequent intrinsic motivation—has recently found experimental support in studies of the effects of extrinsic rewards by Lepper, Greene, and Nisbett (1973) and by Greene and Lepper (in press). In these studies, children in individual sessions either were led to expect and then were given an extrinsic reward for engaging in an activity of initial intrinsic interest; were given this same reward unexpectedly after they had finished with the activity; or were offered no extrinsic reward for engaging in the activity. Subsequently, unobtrusive measures of these children's intrinsic interest in the activity were obtained in their classrooms, in the absence of any expectation of reward. The results in both studies indicated that expectation of a reward while engaging in the activity, relative to the other conditions, significantly undermined the children's intrinsic interest in that activity.

In the context of this previous research, the present study has two major purposes: (a) to extend the generality of the conclusions of earlier studies concerning the effects of extrinsic rewards on later intrinsic interest by attempting to replicate earlier results with an experimental activity and extrinsic reward quite different from those employed in previous research; and (b) to examine, at the same time, the effects of adult surveillance during the experimental sessions on subsequent intrinsic interest in the activity. Furthermore, because the implications of manipulations which undermine children's intrinsic interest in activities extend far beyond the laboratory setting, the present study seeks to emphasize the relevance of any results obtained for real-world settings by examining the effects of surveillance and expectation of extrinsic rewards on children's intrinsic interest in a natural classroom setting.

To these ends, the study involved a  $3 \times 2$  design in which surveillance (high-low-no) and expectation of reward (expected-unexpected) were manipulated orthogonally. Pre-school children were asked to engage in a

<sup>1</sup> Actually, Kruglanski's (1970) replication of the original Strickland study suggests that this last link in the chain—the relationship between attributed trustworthiness and future monitoring—may be somewhat more complex than indicated here. In a condition in which supervisors had the power to reward rather than fine the monitored subordinates, and in which the subordinate under initially high surveillance never performed well enough to receive a reward, supervisor-subjects trusted previously highly monitored subordinate less, yet monitored the other, more trusted subordinate more, thereby offering him a chance to earn rewards in the subsequent session.

novel activity in individual sessions. In the expected reward conditions, subjects expected to be able to win a chance to play with a highly attractive set of toys by engaging in the activity; while in the unexpected reward conditions, subjects had no knowledge of these toys until they were finished with the activity. All subjects were asked to undertake the activity in the experimenter's absence. Orthogonal to the manipulation of reward expectancy, subjects in the surveillance conditions were told that the experimenter would be monitoring their performance during the session either most of the time (high surveillance) or only occasionally (low surveillance), while subjects in the nonsurveillance conditions were given no such expectation. From a self-perception perspective, it was predicted that both surveillance and the expectation of an extrinsic reward would decrease the amount of interest children would show in the activity later, in their classrooms, where extrinsic pressures were absent.

## METHOD

### *Subjects and Experimental Setting*

The subjects for this study were 80 preschool children, ranging in age from 4 years to 5 years 3 months, selected from the student population at the Bing Nursery School, located on the Stanford University campus. These children came from predominantly white, middle-class backgrounds, and the sample included 39 males and 41 females. An additional 12 subjects, distributed across conditions, were discarded from the experiment when they were unable to solve the puzzles presented during the experimental session. None of these children had participated in any earlier related experiments on intrinsic motivation.

The Bing Nursery School and its associated research facilities served as the experimental setting for this study. The nursery school consists of three classrooms which conduct similar and simultaneous, but independent classes. Two of the classrooms, equipped with large one-way mirrors and sound equipment, were used in the study. In these classes, the program is, by intention, relatively unstructured, with considerable "free play" time in which children are allowed to choose from among a variety of both continuously and periodically available activities. For the purposes of this experiment, this arrangement allowed the introduction of an experimental activity into the ongoing nursery school program by the nursery school teachers, without intrusion into the classroom by researchers, in a situation in which children's responses to this activity could be unobtrusively observed and recorded.

### *Experimental Materials*

To assess the generality of the findings obtained in previous studies and to provide an activity with explicit performance criteria, the present study employed a task different from that used in earlier studies. This activity consisted of a set of 20 puzzles, each consisting of a  $10 \times 10 \times \frac{1}{4}$  in ( $2.54 \times 2.54 \times .013$  cm.) board with  $\frac{1}{4}$  in (.006 cm.) insets cut to accommodate multicolored plastic puzzle pieces in various geometric shapes. Pretesting suggested this activity to be of initial intrinsic interest to most children and of sufficient similarity to other normal classroom activities so as not to appear strange in the classroom setting. Of this set of 20 puzzles, 10 were selected for use during the experimental sessions. All the puzzles were used later in the classroom.

Similarly, in the interests of generality, this study employed a different extrinsic reward from previous studies. In contrast to the largely symbolic "Good Player Award" used in earlier studies, the present study employed a "Premack" procedure (Premack, 1965), in which the opportunity to play with a collection of highly attractive toys (e.g., a miniature garage and gas station, racing cars, a toy dog, a lunar lander and robot, a doll, etc.) served as the extrinsic incentive. Such a procedure, it was expected, would ensure that at least some of the available toys would provide a strong incentive for each of the subjects.

Finally, in order to study surveillance per se, in the absence of any concurrent feedback to the child concerning his performance or interaction between the subject and the experimenter, this study employed a television camera, through which the child could be told that he was being observed. For this purpose a General Electric television camera, mounted on a movable metal tripod and fitted with a Zeiss zoom lens, was used. This procedure, in addition to eliminating considerable extraneous variance, also permitted a clear variation in the amount of time during the experimental sessions that the subject believed he was actually under surveillance.

### *Experimental Sessions*

For the experimental session, each child was escorted individually to one of the research rooms attached to the nursery school by an adult experimenter. In the experimental room were two long child-sized tables, each holding a set of puzzles, and a television camera mounted on a movable metal tripod placed next to one of the tables. In addition, in the corner of the room by the entrance, was the set of attractive toys, hidden from sight by a cloth screen.

As the subjects entered the room, the manipulation of reward expectancy took place. In the expected reward condition, the experimenter pulled back the cloth screen, exposing the assortment of toys, and asked the subject if he would like a chance to play with them. When the subject as-

sented, the experimenter explained to him that he would be able to earn an opportunity to play with these toys if he did a good job on the puzzles, working hard and solving them as quickly as he could. The cloth curtain was then replaced. In the unexpected reward conditions, the toys were not exposed and no mention was made of their existence.

The subject was then seated at a table which contained four puzzles, which were presented to the child as "practice" puzzles and which established for the child a procedure for the remaining puzzles. The experimenter demonstrated to the subject how to solve the first puzzle and then gave the subject a chance to solve the remaining three puzzles. If at any point the child needed help in solving the puzzles, the experimenter came to his aid, but then asked the child to solve it for himself. When the four puzzles had been finished, the child was asked to spread them out on the table and to ring a small bell as a signal that he had finished the puzzles.

When the child had finished the practice puzzles, the experimenter indicated that it was now time for the child to solve the "real" puzzles on his own. To emphasize further the discontinuity between the two sets of puzzles, the child was asked to move to a second table next to the television camera. This second table contained the six puzzles comprising the actual experimental task and, again, a small bell. The experimenter indicated to all subjects that for these puzzles it was important to work hard and to solve the puzzles as fast as they could. In the expected reward conditions, the experimenter also indicated that how fast the subject did the puzzles and how hard he worked would determine how much time he would be given to play with the toys he had been shown. In short, for all subjects, the experimenter indicated an explicit concern with the child's performance on these puzzles the child was to do alone. On these puzzles surveillance was varied.

In the surveillance conditions, the television camera beside the table was equipped with a zoom lens pointed directly at the table where the subject would be working, and on the table directly in front of the subject was a small light. After the child had been told that the experimenter would be leaving the room, the experimenter explained that he would still be able to see how well the child was doing on the puzzles, from time to time, through the nearby television camera. The experimenter pointed out the camera and explained further that the child would be able to tell when the experimenter was watching him, because the small light on the table in front of him would turn on whenever he was being watched. In the nonsurveillance conditions, the television camera was turned to face away from the table, the lens was removed from the camera, and the small light was removed from the table. No mention was made of the camera or of any surveillance by the experimenter. All subjects were told, however, that when they finished the puzzles they were to lay them out on the table and to ring the bell, as they had done with the practice puzzles, to indicate that they had finished them.

Before leaving the room, the experimenter reinstated the critical elements of procedure for each subject and then exited, leaving the subject alone. As the subject worked on the puzzles, within the surveillance conditions, the amount of surveillance was manipulated by an observer watching the experimental session from behind a one-way mirror along one side of the room. In the low-surveillance conditions, the light signaling the subject that he was being watched by the experimenter was turned on while the subject was working on one of the six puzzles; in the high-surveillance conditions, the light was turned on during four of the six puzzles. In both cases, the choice of puzzles to be undertaken under surveillance was determined by consultation with a predetermined random order. In addition, this observer recorded the amount of time the subject took to solve each puzzle and any comments the child made during the session.

After the subject had completed the six puzzles and had rung the bell, the experimenter reentered the room and indicated to all subjects that they had done a very good job of solving the puzzle quickly. In the expected reward conditions, the experimenter added that because the subject had done such a good job he had earned the chance to play with the toy collection; for subjects in the unexpected reward conditions, the experimenter added simply and in a noncontingent manner that he also had a collection of toys with which the subject might like to play. All subjects were given 10 minutes to play with the toys. At the end of this period, the subjects were thanked and returned to their classrooms by the experimenter.

### *Classroom Observations*

One to 3 weeks after the completion of these individual experimental sessions, the primary measure of subsequent intrinsic interest in the activity, in the absence of any expectation of extrinsic reward, was taken in the subjects' classrooms following the procedure established in previous studies. For the first hour of three consecutive class sessions, the experimental activity was set out by the classroom teachers, among the other periodic activities chosen by the teachers for each day, at a table near the door to the classroom. To increase the accuracy of the measures, when the materials were available the teachers were asked to render inaccessible other similar playing materials and to refrain from sitting at the target table. Otherwise, the teachers behaved in a normal fashion. Hence, when the materials were presented, the children were free to choose between the target activity and the variety of other activities, both indoors and outdoors, offered by the nursery school.

Throughout this period, two observers, each blind to the subjects' experimental conditions and each equipped with an 8-track Rustrak continuous event recorder, were stationed behind a one-way mirror along the wall of the classroom near the table containing the experimental materials. From this vantage point, these observers were able to record with

near-perfect reliability ( $r = .99$ ) the time spent at the target table for each of the children in the classroom.

### RESULTS

Preliminary analyses indicated no significant effect of sex of child or interaction of sex with experimental conditions; hence data were collapsed across this dimension for further analysis. Preliminary analyses also revealed no significant differences between the high-surveillance and low-surveillance conditions on any measure; and these two treatments were therefore collapsed into a single condition for purposes of analysis, yielding a  $2 \times 2$  factorial design (Expected–Unexpected Reward  $\times$  Surveillance–Nonsurveillance).

Figure 1 presents the data of primary interest in this study—the proportion of subjects in each of these four conditions who showed an interest in the experimental activity in the classroom setting. These proportions were transformed to arcsines, and a  $2 \times 2$  analysis of variance was performed on these transformed data (cf. Langer & Abelson, 1972).<sup>2</sup> This analysis yielded significant main effects of both reward expectancy,  $F(1, \infty) = 4.86$ ,  $p < .05$ , and surveillance,  $F(1, \infty) = 4.86$ ,  $p < .05$ , but no interaction between these two variables ( $F < 1$ ). Thus, as in previous studies, expectation and receipt of an

<sup>2</sup> An analogous analysis was also performed on the amount of time each child spent with the materials. The results of this analysis were in the same direction as the nonparametric data, although only the effect of the surveillance,  $F(1, 76) = 4.30$ ,  $p < .05$ , and not the effect of the reward expectancy manipulation,  $F(1, 76) = 2.42$ ,  $p > .10$ , was statistically significant. This parametric analysis presented a less adequate picture of the data in the present study than the nonparametric analysis, however, for two reasons. First, the marked lack of homoscedasticity in these data raises a considerable question as to the appropriateness of the analysis of variance with unequal cell frequencies (cf. Scheffé, 1959). Second, the time data seemed influenced by a number of factors other than interest per se. While in earlier studies the use of drawing materials allowed the child to work in his own way for virtually unlimited amounts of time, the use of puzzles with a clear criterion of completion in the present study created a situation in which extraneous factors such as the number of other children at the target table "tying up" other puzzles, the child's skill in solving puzzles, or his motivation to solve them quickly, as well as the child's interest in the activity, seemed to affect the amount of time spent with the materials.

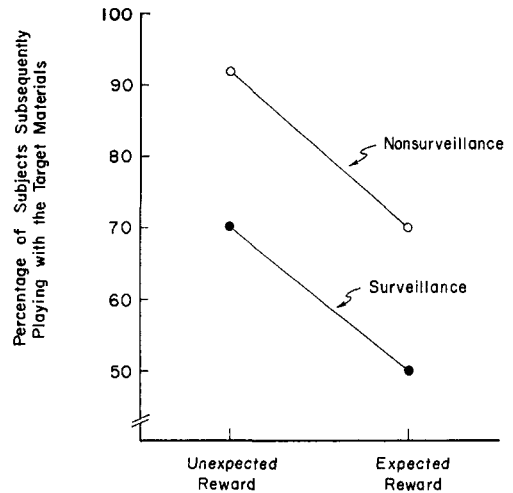


FIGURE 1. Subsequent intrinsic interest in the target materials, by treatment conditions.

extrinsic reward for engaging in an activity was sufficient to produce decreased intrinsic interest in the activity in the classroom setting; and, orthogonal to this effect, surveillance by the experimenter during the task produced an additional decrease in later interest in the activity.

Because this study did not include measures of preexperimental interest in the target materials, of course, it is possible to argue that interest in the materials may have been increased under the nonsurveillance and unexpected reward conditions rather than decreased by surveillance and expected rewards. Although imperfect, some relevant data are available from a pretest of the materials in another classroom at the same nursery school, in which the materials were presented for a single session following the same procedures as in the experiment proper. In this case, 29 of 34 children (85%) played with the materials, suggesting quite a high level of initial interest in the activity. The present interpretation of the data from this study, moreover, is consistent with previous data collected in conceptually analogous experiments in this setting which have shown (a) expected rewards to produce significant decreases in interest from baseline classroom measures (Lepper et al., 1973), and (b) expected rewards to produce significant decreases in subsequent interest relative to both no-reward and unex-

pected reward control groups, which did not themselves differ (Lepper et al., 1973; Greene & Lepper, in press).

In addition to these data of principal interest, the study also yielded a score for each subject on the amount of time he required to solve the six puzzles during the experimental session, and these scores were also submitted to a  $2 \times 2$  analysis of variance. This analysis yielded a marginally significant effect of reward expectancy,  $F(1, 76) = 3.08$ ,  $p < .10$ , with subjects expecting to receive a reward tending to solve the puzzles more quickly than subjects not expecting a reward, but no significant effect of surveillance ( $F < 1$ ) or interaction of surveillance with reward expectancy ( $F = 1.26$ ) on puzzle speed. It should be noted, however, that this speed measure was probably not a good indicator of the immediate effects of surveillance on performance, since any potentially facilitating effects of the surveillance manipulation may have been obscured for some subjects by the obviously distracting effect of the presence of the camera and light.

#### DISCUSSION

The results of the present study, then, replicate and extend the findings of previous research on the ways in which extrinsic incentives may undermine children's intrinsic interest in an activity. As in previous studies (Lepper et al., 1973; Greene & Lepper, in press), children tended to work more quickly during experimental sessions when they expected to earn a reward; nevertheless, children who anticipated and received an extrinsic reward for engaging in an activity of initial interest were less likely to show interest in that activity subsequently, in a classroom situation in which extrinsic incentives were absent, than children who had not expected a reward during the experimental sessions. Furthermore, the fact that the present study was able to replicate previous results with an activity, a reward, and a procedure quite different from those employed in earlier studies attests to the generality of the basic phenomenon.

At the same time, the present study also indicates that adult surveillance during the time the child was engaged in the task was

itself sufficient to produce a similar decrement in subsequent intrinsic interest in the activity, as suggested by a self-perception analysis of this situation. The knowledge that one's performance at a task is being observed and evaluated by someone else, even when there is no explicit expectation of any tangible reward for engaging in the activity, appears sufficient to decrease later interest in the task.

Interestingly, the data from the present study suggest that it made little difference whether this surveillance was only occasional or nearly constant. Whether this result is due to an insufficiently powerful manipulation of amount of surveillance or whether the means by which surveillance adversely affects intrinsic interest is an all-or-none process remains an interesting question for further research. Similarly, although the methodological advantages of the present televised surveillance technique are clear, it is also important for future research to examine, as well, the effects of face-to-face monitoring, which may depend heavily on the character of the interaction between the agent and the object of surveillance.<sup>3</sup>

Notwithstanding the theoretical subtleties of this process, however, the practical implications of these studies seem considerable for schools and other institutions in which systems of extrinsic incentives and periodic surveillance are employed to control and manipulate behavior. To the extent, for example, that many of the activities we ask children to attempt in school may be of some initial intrinsic interest to at least some of the children, the effect of presenting these activities in the context of a system of extrinsic incentives and adult surveillance may be to undermine that intrinsic interest in those activities. Unwittingly, these studies suggest, we may

<sup>3</sup> Since the surveillance manipulation in this study bears more than a passing resemblance to procedures employed by Duvall and Wicklund (1972) to manipulate "objective self awareness," it may be worth noting that at least inferentially in this study this manipulation served to increase "external" rather than "internal" attributions. While it is certainly not clear that an objective self-awareness position would speak to the present situation, these data may suggest the importance of looking at such manipulations under "low-dissonance" as well as "high-dissonance" conditions.

often turn activities of initial interest into drudgery which children engage in only when external pressures are present to force or lure them to do so—a suggestion which is highly congruent with the observations of a number of analysts of our current educational system (Holt, 1964; Jackson, 1968; Silberman, 1970). As Jackson has suggested in his perceptive book, *Life in classrooms*:

The distinction between work and play has far-reaching consequences for human affairs, and the classroom is the setting in which most people encounter this distinction in a personally meaningful way. According to one of its many definitions, work entails becoming engaged in a purposeful activity that has been prescribed for us by someone else; an activity in which we would not at the moment be engaged if it were not for some system of authority relationships. As preschoolers the students may have played with the concept of work, but their fanciful enactments of adult work usually lack one essential ingredient, namely: the use of some kind of an external authority system to tell them what to do and to keep them at their job. The teacher, with his prescriptive dicta and his surveillance over the students' attention, provides the missing ingredient that makes work real.

It may be objected, of course, that many activities we ask of children in school are of little or no intrinsic interest to the children; that there are many important activities in which children would not engage spontaneously without external pressure or offer of external reward. We agree completely and suggest that in these cases the use of extrinsic rewards is necessary and appropriate. Certainly the "lesson" to be learned from these studies is not that extrinsic rewards should be abandoned, but rather that if one wishes to foster an interest in activities which would manifest itself in situations or at times when extrinsic pressures are absent, one would be well advised to employ the minimal amount of pressure sufficient to elicit or maintain the desired behavior. A virtually identical recommendation, it might be noted, has recently been offered by researchers concerned with

the practical problem of promoting "generalization" of the effects of token economy programs beyond the immediate situation in which rewards are available (O'Leary, Drabman, & Kass, 1973), suggesting further the applicability of these results in natural settings.

It is also worth noting, however, that any observer's estimate of the inherent interest value an activity has for an actor is colored by the setting in which he observes the actor engaging in the activity. If we, like the supervisors in the Strickland (1958) study, observe an actor engaging in an activity when extrinsic pressures are great, we would attribute his behavior to the external contingencies in the situation. In fact, if the self-perception account is correct, it would suggest that the use of overly sufficient pressure to induce a person to engage in an activity may produce a self-sustaining and self-fulfilling cycle since both the source and the recipient of that pressure would be subject to the same attributional "bias." Thus, the teacher or supervisor comes to believe that the child or worker is motivated only by external pressures and therefore maintains that external pressure, while the maintenance of that pressure in and of itself may ultimately convince the child or worker himself that he is motivated by the external pressure, making him less likely to engage in the activity in the later absence of that pressure.<sup>4</sup>

Such self-fulfilling cycles, as "superstitious" behavior, are not likely to be discovered by the participants, who have no reason to be skeptical of the necessity of a system of overt extrinsic controls; indeed, the mere existence of such controls bears testimony to their necessity. Demonstrating that they are *not* necessary, moreover, is possible only to the extent that the participants do not already be-

<sup>4</sup> Indeed, one subtle message of a supervisor's use of extrinsic incentives to control a subordinate's behavior may be his distrust of that subordinate's "intrinsic" motivations, or even his own dislike for the activity, and such an implicit communication may well be one part of the process by which an overjustification effect may be produced. Further research to sort among these various attributional alternatives, perhaps through the use of observer-subjects as well as actors, would certainly seem appropriate.

lieve the contention to be disproved. If, as Kipnis (1972) has proposed, the mere availability of institutional powers to a supervisor is virtually sufficient to ensure their use, the prevalence of self-sustaining cycles of surveillance and extrinsic control in our society is not surprising. A self-perception perspective suggests that the prospects for being able to set up institutions so as not to perpetuate these cycles would be substantially improved by further attention to the processes by which people make inferences about their own and others' motivations.

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