Does Reinforcement Destroy Intrinsic Motivation?

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Despite the effectiveness of reinforcement procedures, there has been much controversy about their use. Critics contend that using reinforcement will undermine the subject's intrinsic motivation. They assert that a person whose behavior is reinforced will be less likely to perform that behavior when reinforcement is withdrawn and argue that the rate of behavior may even decrease below initial baseline levels. Consequently, the use of reinforcement procedures in the schools or workplace is strongly discouraged. This paper will examine the assertions made by several critics of reinforcement, specifically Edward L. Deci, Mark R. Lepper and Alfie Kohn. The aim of this paper is to demonstrate that their assertions are unfounded and based on conceptual misunderstandings. Methodological problems, alternate explanations and recent research findings will also be discussed.

The Case Against Reinforcement

Deci's Approach

Deci defined intrinsically motivated behaviors as "behaviors in which a person engages in to provide himself with a sense of competence and self-determination" (Deci, 1975). Based on the cognitive evaluation theory, Deci made various propositions about the effects of rewards on intrinsic motivation and supported his predictions with empirical evidence.

Deci's first proposition states that "one process by which intrinsic motivation can be affected is a change in perceived locus of control of causality from internal to external. This will cause a decrease in intrinsic motivation, and will occur...when someone receives extrinsic rewards for engaging in intrinsically motivated behavior". This proposition implies that if people perceive the locus of control outside themselves, they will behave in accord with this perception. Thus, if people believe that they engage in an activity because of an extrinsic reward, subsequently they will engage in that activity only when they think it will lead to the extrinsic reward (Deci, 1975). In support his first proposition, Deci cited the results of some of his earlier studies. In the first, (Deci 1971) college students were given 3 thirteen-minute sessions to solve a puzzle, which in pilot testing was found to be intrinsically motivating. The subjects were then observed for an 8-minute free-choice period during which they could engage in any activity. Deci found that those who had received money for solving the puzzle were less likely to engage in the puzzle activity during the free-choice period than those who were not paid. In a second study, Deci and Cascio (1972) found that threat of punishment for incorrect performance, which supposedly results in perceived external control, also decreased intrinsic motivation. Deci affirmed that the results of these studies support the assertion that perceived external control decreases intrinsic motivation (Deci, 1975).

Deci's second proposition states that "the second process by which intrinsic motivation can be affected is a change in feelings of competence and self-determination. If a person's feelings of competence and self-determination are enhanced, his intrinsic motivation will increase. If his feelings of competence and self-determination are diminished, his intrinsic motivation will decrease" (Deci, 1975).

His third proposition explains that "every reward (including feedback) has two aspects, a controlling aspect and an informational aspect which provides the recipient with information about his competence and self-determination. If the controlling aspect is more salient, it will initiate the change in perceived locus of causality process. If the informational aspect is more salient, the change in feelings of competence and self-determination process will be initiated" (Deci, 1975). Together, the two propositions predict that when the controlling aspect of rewards is salient, the person will perceive the locus of causality as external, and intrinsic motivation will decrease. If the control aspect is not salient, then the informational aspect of the reward will provide the person with feelings of competence and self-determination, and intrinsic motivation will increase. Again, Deci cites his own research to support these two propositions. The finding that

subjects who received positive verbal feedback showed increases in intrinsic motivation (Deci 1971) was cited as evidence that if the informational aspect of rewards caused feelings of competence, intrinsic motivation increased. Deci, Cascio and Krusell's (1973) finding that negative feedback (which provides information, but not feelings of competence), decreased intrinsic motivation was also interpreted as indicative of the effects of feelings of competence and self-determination on intrinsic motivation. Finally, he cited a (Deci 1972) study which found that subjects who were paid based on the quality of performance subsequently showed less intrinsic motivation than those who were paid regardless of how well they did. Deci asserted that this occurred because in the quality-based condition the controlling aspect was more salient.

Lepper's Perspective

M. R. Lepper conceived of intrinsic motivation as "a measure of task engagement in a situation in which salient extrinsic contingencies had been deliberately minimized"; while extrinsically motivated activities had "instrumental value in producing tangible or social rewards" (Lepper, 1978). Lepper interpreted the effects of extrinsic rewards on motivation based on ideas derived from cognitive-dissonance research on insufficient justification (Aronson, 1966). The research on insufficient justification revealed that individuals who were induced to engage in attitudinally inconsistent behavior and given little extrinsic justification for this behavior later reported that their actions had been intrinsically rather than externally motivated. Thus, when external contingencies were insufficient to account for their actions, people attributed the actions to their own internal dispositions.

Lepper (1978) proposed that the converse effect could explain the detrimental effects of extrinsic rewards, when used to induce a person to engage in an initially intrinsically interesting activity. He posited that when "extrinsic incentives are sufficiently salient and seemingly 'oversufficient', the individual will attribute his or her behavior to these compelling extrinsic contingencies rather that to an intrinsic interest in the task and would therefore be less likely to regard the activity as interesting in itself" (Lepper, 1978). This proposition was called the "overjustification hypothesis" and predicted decreases in task motivation when people were presented with initially intrinsically interesting activities under conditions that made salient the instrumentality of these activities "as a means to some ulterior end". The overjustification hypothesis also predicted that the more salient the external motivation, the greater the decline in intrinsic motivation (Lepper, 1978). Lepper supported his hypothesis by citing a study performed by Lepper, Greene, and Nisbett (1973). In this study, the initial level of intrinsic motivation was measured by the amount of time preschoolers spent on a drawing activity during free-play periods, when they were free to choose among many other alternatives. These children were then divided into 3 groups: expected reward, unexpected reward, and no reward. Lepper predicted that giving an unexpected reward would not produce a detrimental effect on intrinsic motivation because the instrumental aspect of the behavior was less salient. Results confirmed Lepper's predictions as only in the expected reward group showed a decrease in intrinsic motivation. Lepper interpreted this finding as supporting evidence for his overjustification hypothesis (Lepper, 1978).

Kohn's Views

Alfie Kohn asserted that, although rewards increase the probability that we do things, they change the way we do those things. Rewards cause people to do things only because of what they expect to get in return. In contrast, intrinsic motivation "means enjoying what one does for its own sake" (Kohn, 1993). Kohn cited Deci and Lepper's research findings as evidence of the detrimental effects of rewards on intrinsic motivation. He then offered two reasons why he believed these detrimental effects occurred. The first reason is that "anything presented as a prerequisite for something else--that is, as a means toward some other end--comes to be seen as less desirable" (Kohn, 1993). [This reason resembles Lepper's view of the effects of perceived task instrumentality on intrinsic motivation.] Kohn supports this assertion by citing two studies. One is Lepper's (1982) study which found that children

who were told a story in which a child had to try two new foods, but was required to finish one food before s/he was allowed to try the other, subsequently reported that they would prefer to eat the food that was set up at the end, not the means. The other study is the Freedman et al., (1992) study which found that the greater the incentive used to get someone to engage in an activity, the more negatively people would view the activity for which it was received.

Kohn's second reason is that "rewards are usually experienced as controlling and we tend to recoil from situations where our autonomy is challenged." Being told what to do and how or when to do it, interferes with our sense of self determination and produces undesirable consequences (Kohn, 1993). [This reason resembles Deci's predictions.] As you can see, Kohn's approach combines Deci's and Lepper's theories. In fact, he uses their findings support his assertions. Kohn's perspective is not very novel nor is it based on evidence yielded by his own research; rather it serves to integrate some aspects of Deci and Lepper's views.

Reinforcement Defense

This section will discuss the conceptual and methodological flaws of the assertions made by Deci, Lepper, and Kohn and present evidence that reinforcement does not necessarily lead to decreased intrinsic motivation. Since Kohn's view is based on Lepper's and Deci's work, any evidence that refutes Deci's or Lepper's assertions automatically refutes Kohn.

Conceptual Flaws

First, it is important to state that there is no concrete evidence that intrinsic motivation exists; therefore, it is dubious that it can be decreased by reinforcement. Researchers have inferred the existence of intrinsic motivation from the behaviors they observed, specifically time spend on a task when reinforcement contingencies were not *deliberately* applied. But, there may have been unnoticed contingencies of reinforcement maintaining the target behavior before the intervention began. Unfortunately, since the only thing observed during the baseline phases of both Deci's and Lepper's work was the time spent on the activity, and not the antecedents or consequences of the activity, functional contingencies were not detected. The fact that they were not detected does not mean that these contingencies did not exist, but rather that the experimenters did not bother to search for them. Scott's research lends support to the possibility that undetected contingencies were in fact responsible for maintaining the behaviors that Deci and Lepper posited as being intrinsically motivated. Scott et al. (1988) found that "when behavior was sustained in a task setting in the apparent absence of salient extrinsic reinforcers, subtle response-produced stimulus changes were found to be involved". He proposed that a wide variety of so-called intrinsic behaviors can be acquired and maintained by the stimulus changes they produced. In short, it is not certain that there was an intrinsic cause for the behaviors studied by Deci or Lepper. Intrinsic motivation was merely a label posited to explain behaviors for which no obvious external cause was identified. This label was used to avoid the arduous task of seeking a legitimate explanation for the observed decrements in performance, as no attempts were made to search for the real causes for the decline in behavior or to identify the contingencies that maintained the behavior in the first place.

The decrements in performance observed by Deci and Lepper may have been due to a temporary disruption of the target behavior caused by superimposing a new reinforcement contingency over the preexisting contingencies that operated on the behavior before intervention. Flora (1990) proposed that "reduced rates of behavior typically attributed to the undermining of intrinsic interest are more objectively accounted for by environmental stimuli functions, including instructional control". Scott (1975) suggested that reinforcing stimuli come to act as discriminatory stimuli "in the presence of which behavior incompatible with operants maintained by sensory stimuli has been reinforced". Thus, "the introduction of a reinforcing event, would be expected to disrupt ongoing operants until those incompatible behaviors were extinguished". Basically, Scott's (1975) position is that the undermining effect is temporary and is caused by introducing yet another reinforcer into a preexisting system of complex or multiple contingencies. Finally, Scott (1975) maintains that

any type of sensory stimulation has reinforcing properties which can be modified by satiation and deprivation procedures. Consequently, the decrements on the target behavior observed during the free-play periods may be caused by the fact that the subjects are satiated.

Other alternate explanations for the decrements in performance have been proposed. First, the competing response hypothesis stated that subjects were "less interested in the (intrinsic) target behavior to the extent that responses are elicited that interfere with the target activity prior to the termination of contingencies" (Reiss & Sushinsky 1975). Preexposing subjects to a rewarding stimulus, either verbally or visually, may elicit responses that interfere with the target behavior and, consequently, cause it to decrease. Elicited responses that disrupt the target behavior may include "perceptual distraction, cognitive distraction (e.g., thinking about reward), excitement, anticipation of reward (Miller & Estes, 1961; ShefBeld,1966), or frustration resulting from delay or withdrawal of reward (Barker, Dembo, & Lewin,1941; Perry, Bussey, & Redman, 1977)" (Reiss & Sushinsky,1975). Second, the frustration hypothesis (Perry et al., 1977) proposed that when the reward for an activity is withdrawn, the activity acquires aversive properties through arousal of "anticipatory frustration" and this causes decreased interest in the activity.

Procedural Flaws

The procedures used in many studies of intrinsic motivation were flawed because rewards were used instead of legitimate reinforcement procedures. Cameron and Pierce (1994) conducted a meta-analysis of 100 published studies on the effects of reinforcement on intrinsic motivation and found that only a few studies tested for reinforcement effects as demonstrated by systematic increases in behavior due to the consequences that followed it. Because there was no test for reinforcement in most of the experiments that yielded decreases in intrinsic motivation, Cameron suggested that those findings should discussed in terms of the effects of rewards, rather than of reinforcers. "A reward is defined as something satisfying (by the person who gives it), not by an increase in behavior" (Pierce & Epling, 1995). It appears that Deci, Lepper and Kohn were aware of the fact that they were not utilizing of true reinforcement procedures as they all tended to use the word "reward" in the writings instead of the word "reinforcement". Additionally, Cameron and Pierce (1994) found that in the those few studies that used legitimate reinforcement procedures (Davidson & Bucher, 1978; Feingold & Mahoney, 1975; Mawhinney, Dickinson & Taylor, 1989; Vasta, Andrews, McLaughlin, Stirpe & Comfort, 1978; Vasta & Stirpe, 1979), reinforcement did not decrease intrinsic motivation.

Research Evidence

The results of several empirical studies also refute Deci's and Lepper's predictions. Davidson & Bucher (1978) assessed the effects of a continuing token reinforcement program in repeated test sessions and found no evidence of decreased intrinsic interest in the rewarded activity. In Dukes (1983), kindergartners were chosen because of their initial interest in question asking and were assigned to either a self-administered reinforcement group, an experimenter-administered reinforcement group, or a no-reinforcement group. Following 6 days o training, a post-test (without reinforcement) was administered. This post-test revealed no significant differences between groups, indicatin that intrinsic interest was not affected by reward

Smith (1980) assessed for Lepper's overjustification effect in 4th and 5th graders. H found that reinforcement does not cause the overjustification effect. In fact, "the reinforcemer or reward value aspect, led to the opposite effect--an increase in interest and post-contingen performance". Scott et al. (1988) assigned university students tasks, with varied levels of sensory reinforcement and complexity, under tw conditions of monetary reinforcement: announc and unannounced. Results demonstrated that "when a signaled extrinsic reinforcement contingency was applied it produced a significa increase in task performance during the time th extrinsic reinforcement contingency prevailed a did not produce a decrement in self-reports of t attractiveness nor in performance when the contingency was withdrawn" (Scott, 1988).

Mawhinney et al. (1989) used concurrent schedules of reinforcement to determine the ext

to which behavior was controlled by the extrinsic versus intrinsic rewards and found that extrinsic rewards did not weaken the reinforcing value of the intrinsic rewards following reward termination. Mawhinney (1990) found that people who are most highly intrinsically motivated by a task are the least likely to exhibit any post-reinforcement decrements in intrinsic motivation. Skaggs et al. (1992) replicated the results of Mawhinney et al.(1989). Taken together, the results of the preceding studies serve as evidence that salient reinforcement contingencies do not necessarily lead to decreased intrinsic motivation as indicated by declines in performance.

Conclusion

Despite the attacks against reinforcement brought forth by Deci, Lepper and Kohn, there is no convincing evidence to indicate that properly implemented reinforcement procedures inevitably cause subsequent decreases in intrinsic motivation. The conclusions reached by critics of reinforcement are incorrect and based on their erroneous interpretations of the principles and methods of reinforcement. Further, more reasonable explanations, which do not rely on hypothetical, unverifiable entities like intrinsic motivation, can be advanced to account for the observed decrements in performance.

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