

Extrinsic Reinforcement in the Classroom: Bribery or Best Practice

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Abstract. The debate over the effects of the use of extrinsic reinforcement in classrooms, businesses, and societal settings has been occurring for over 30 years. Some theorists have cautioned against the use of reward, whereas others have found little, if any, detrimental effect. This article examines the debate with an emphasis on data-based findings. The extrinsic/intrinsic dichotomy is explored along with seminal studies in both the cognitive and behavioral literatures. The results from important meta-analytic studies are presented. From this review, it is concluded that little detrimental effect is found with the use of external reinforcement. Readers are given specific recommendations on the appropriate use of reinforcement programs in educational settings.

Many educational personnel have at least some rudimentary knowledge of the effects of rewards and/or reinforcement on students' behavior in school settings. Observations of classrooms and school settings frequently reveal evidence of some sort of reward system for academic output and/or appropriate behavior. For example, stickers may be given to students for completed assignments or pizza coupons may be given for appropriate classroom behavior. Schools have successfully employed the use of external rewards for decades (Slavin, 1997). The past 40 years have witnessed the success of the use of reinforcement procedures in the classroom (Allyon & Azrin, 1968; Barrish, Saunders, & Wolf, 1969; Buisson, Murdock, Reynolds, & Cronin, 1995; Cavalier, Ferretti,

& Hodges, 1997; O'Leary & Drabman, 1971; Swiezy, Matson, & Box, 1992).

Along with the research on the effectiveness of external reinforcers in the schools, there has been a rise in concern on the part of some educators and psychologists over the use of reward contingency systems in classrooms across the country (Deci, Koestner, & Ryan, 1999a, 1999b, 2001; Kohn, 1993, 1996). The problem, these researchers assert, is the effect an extrinsic reinforcer may have on a student's intrinsic motivation to perform a reinforced task once the reinforcer for that task is withdrawn. These researchers speculate that if reinforcement strategies are used, an individual's perceptions of competence and self-determination will decrease, thereby decreasing that

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individual's intrinsic motivation to perform the task. For example, in some teacher guidebooks, teachers are told that the use of extrinsic reinforcement can decrease creativity (Tegano, Moran, & Sawyers, 1991). Further, many teacher education programs embrace a cognitive theory of education (e.g., Bruner, 1960) that emphasizes intuition and insight to facilitate learning. In the resulting teaching practices (e.g., discovery learning, constructivism), the teacher does not impart knowledge; rather, the focus is on arranging the environment to help students "discover" knowledge. The accent is on internal, intrinsic machinations with no external reinforcement procedures used. This pedagogical instruction may be in direct conflict with research supporting the use of external reinforcers in the classroom and the efficacy of direct instruction (Alberto & Troutman, 2003). Finally, Kohn (1993) goes as far as to state that the use of external rewards, even verbal praise, can be considered bribery to invoke temporary obedience and make children dependent on adult approval. This perspective is prevalent not only in teacher education programs, but in society as a whole.

The debate regarding the use of extrinsic reinforcers began in the 1970s with studies attempting to examine the effects of reward on an individual's intrinsic motivation. The debate gained new impetus in 1994 when Cameron and Pierce conducted a meta-analysis on this topic (Cameron & Pierce, 1996; Kohn, 1996; Lepper, 1998; Lepper, Keavney, & Drake, 1996; Ryan & Deci, 1996). More recently, two additional meta-analytic studies have been conducted to examine the effects of extrinsic reinforcers on intrinsic motivation (Cameron, Banko, & Pierce, 2001; Deci et al., 1999a). The results have been contradictory with some reviewers finding no detrimental effect or detrimental effect only under certain prescribed conditions (Cameron & Pierce, 1994; Cameron et al., 2001) and other researchers finding negative effect (Deci et al.). Further, other reviewers have attempted to provide illumination for contradictory findings by examining findings of detrimental effect from a behavioral, scientific perspective (Akin-Little & Little, 2004; Carton, 1996; Dickinson, 1989; Flora, 1990).

The present article brings this debate into the school psychology literature and attempts to review the evidence of the effectiveness of reinforcement programs as currently used in school settings. An attempt is made to define the terms intrinsic and extrinsic motivation from a historical perspective. Cognitive investigations that form the basis for criticisms of the use of reward are discussed and critiqued in terms of methodological concerns, the use of the construct "intrinsic motivation," and whether or not it is prudent to study an unobservable construct. Alternative, behavioral explanations for perceived decrements are also presented. Findings from behavioral investigations (i.e., studies using repeated measures) that have tended to be ignored are detailed and recent meta-analytic findings (i.e., Cameron et al., 2001; Deci et al., 1999a) are discussed. Best practice suggestions for both teachers and school psychologists are offered on the use of extrinsic reinforcement in the classroom. Finally, ideas for future research are provided.

Defining Intrinsic and Extrinsic Motivation

An intrinsically motivated behavior has been defined by Deci (1975) as one for which there exists no recognizable reward except the activity itself (e.g., reading). That is, behavior that cannot be attributed to external controls is usually attributed to intrinsic motivation. Consequently, an extrinsically motivated behavior refers to behavior controlled by stimuli external to the task. The work of Harlow, Harlow, and Meyer (1950) is generally cited as the first attempt to distinguish between intrinsic motivation and externally rewarded behavior. Harlow et al. studied rhesus monkeys given a puzzle-solving task. Because the monkeys solved the task with no identifiable reward (e.g., food, water), the researchers extrapolated from this that the monkeys' intrinsic motivation must account for their exploratory and manipulative behavior. Based upon these findings, behavior exhibited when using external rewards (i.e., raisins) was labeled as behavior extrinsically motivated and behavior exhibited when no rewards were observed was labeled as behavior intrinsically motivated. Subsequent researchers have also at-

tempted to define intrinsically motivated behavior. These definitions have included defining intrinsic motivation as the need for achievement (McClelland, Atkinson, Clark, & Lowell, 1953), the need to be effective and competent in dealing with one's environment (White, 1959), the need to conceive of oneself as the locus of causality (DeCharms, 1968), or the need to be self-determining and competent (Deci).

Not surprisingly, a debate has resulted surrounding the distinction between intrinsic and extrinsic motivation. Several critics (e.g., Guzzo, 1979; Scott, 1975) have produced data that illuminate the problems associated with identifying intrinsically motivated behaviors. Other theories have been proposed that purport to explain behavior that appears to occur in the absence of any extrinsic motivation. These behaviors may, in fact, be due to anticipated future benefits (Bandura, 1977) or intermittent reinforcement (Dickinson, 1989). Some have suggested that cognitive definitions of intrinsic motivation are definitions "by default" (Zimmerman, 1985). In other words, when no external reward mechanism is found controlling a particular behavior, the motivation for that behavior is identified as intrinsically controlled. Additionally, the criticism that contingent consequences may decrease intrinsic motivation is based on the belief that a "sharp distinction can be made between behavior maintained by obvious environmental consequences—*extrinsically motivated behavior*—and behavior that occurs in the seeming absence of consequences—*intrinsically motivated behavior*" (Dickinson, 1989, p. 1).

According to Deci's (1975) definition, intrinsic motivation is evidenced when people participate in an activity because of the internal enjoyment of the activity and not because of any perceived extrinsic reward. That is, behavior that cannot be attributed to external controls is usually attributed to intrinsic motivation. Intrinsic motivation enables people to feel competent and self-determining. Intrinsically motivated behavior is said to result in creativity, flexibility, and spontaneity. In contrast, extrinsically motivated actions are characterized by pressure

and tension, and are believed to result in low self-esteem and anxiety (Deci & Ryan, 1985).

Distinctions between extrinsic and intrinsic consequences can also be found in writings by Horcones (1987) and Mawhinney, Dickinson, and Taylor (1989). Horcones states that intrinsic consequences occur in the absence of programming by others. They are natural and automatic responses inevitably produced by the structural characteristics of the physical environment in which humans exist. Extrinsic consequences, conversely, are those that occur in addition to any intrinsic consequences and are most often programmed by others (i.e., the social environment, researchers, teacher, applied behavior analysts). Consequently, Mawhinney et al. (1989) offer the following definition: "Intrinsically controlled behavior consists of behavior controlled by unprogrammed consequences while extrinsically controlled behavior consists of behavior controlled by programmed consequences" (p. 111). Although early theorists and experimenters (Harlow et al., 1950) have attempted to explain behavior through the use of the unobservable construct, a definition of intrinsic motivation that all can agree upon has yet to be written. Clearly, this is related to competing theoretical orientations (e.g., behavioral, which calls for observable phenomena and social cognitive, which accepts nonobservable phenomena).

In general, if the dichotomy between intrinsic and extrinsic motivation is accepted, intrinsic motivation is assumed to be of greater value (Fair & Silvestri, 1992). This belief is due in large part to the Western conceptualization of the human as autonomous and individualistic. In this view, humans are driven toward self-actualization and any occurrence that impinges on self-determination causes dissonance. Further, the use of extrinsic reinforcement is seen as controlling and/or limiting self-discovery, creativity, and the capacity for humans to reach fulfillment (Eisenberger, Pierce, & Cameron., 1999). Interestingly, when this tenet is examined in relationship to the use of punishment, punishment is perceived as less of a threat to autonomy because humans may choose how to behave to avoid punishment (Maag, 1996, 2001).

Cognitive Investigations of Intrinsic/ Extrinsic Motivation

Deci's Initial Studies

In three different experiments conducted by Deci in 1971, the "effects of externally mediated rewards on intrinsic motivation" (p. 105) were explored. These studies sought to answer the question: Will intrinsic motivation decrease, increase, or remain the same after extrinsic rewards have been experienced? All three experiments were based on the same general paradigm with behavioral observations taking place during three different sessions. The participants first performed the tasks without any external reward. Next, half of the participants were rewarded for performing the activity, and half of the participants received no reward. Finally, rewards were withdrawn and further observations were made.

In the first experiment, college students participated in three separate sessions conducted over a 3-day period. During each 1-hour session, the participants were presented with a puzzle-solving task that appeared to be intrinsically interesting to college students. The first session consisted of all participants performing the task without any offer of reward. During the second session, experimental participants were promised \$1.00 for each puzzle solved. The third session was identical to the first session, and the experimental participants were told that a reward was unavailable. Intrinsic motivation was defined as the number of seconds participants spent on the task during free-choice periods. These periods occurred when the experimenter left the room in the middle of a session and informed the participants that they could choose to work on their activity. Results of this study indicated that the presentation of rewards increased the experimental participants' time on task (i.e., extrinsic motivation), whereas the withdrawal of rewards decreased the experimental participants' time on task (i.e., intrinsic motivation). During the final phase of the study, significant differences in time on task were observed between the experimental and control participants, with the control participants engaging in more time on task.

In the second experiment, Deci (1971) examined the amount of time college student

participants spent completing newspaper headlines. Similar to the findings of the previously reviewed study, Deci reported that the inducement of rewards increased the experimental participants' extrinsic motivation for the activity, but the withdrawal of rewards undermined the experimental participants' intrinsic motivation for the task. Deci concluded that the results from both of these experiments supported the hypothesis that external rewards negatively affect intrinsic motivation. He suggested that intrinsic motivation will decrease if an extrinsic reward is obtained in a situation where individuals normally perceive themselves to be the origin of their behavior.

In the third experiment, Deci (1971) replicated many of the procedures reported in the first experiment; however, verbal praise (i.e., very good, much better than average for this configuration) was substituted for tangible rewards. Results of this experiment were similar to those reported in the first experiment. Participants assigned to the experimental group spent more time on task than participants assigned to the control condition. Deci also measured whether or not the participants found the task to be enjoyable and interesting. Using a 9-point self-rating scale, Deci found scores virtually identical to the findings of the first experiment; that is, participants seemed to find the task enjoyable and interesting. Based on data collected from Experiment 3, Deci found that the experimental group spent what he labeled significantly more time on the task (difference scores between Session 3 and Session 1) than those who received no praise. According to Deci, these results suggested that social rewards do not decrease an individual's intrinsic motivation to perform an activity, and may even enhance intrinsic interest. From the results of these experiments, cognitive evaluation theory (Deci & Ryan, 1985) was developed.

Cognitive Evaluation Theory

Deci and Ryan's (1985) cognitive evaluation theory is based on the assumption that self-determination and competence are innate human needs. Cognitive evaluation theory states that events facilitate or hinder feelings of competence and self-determination depend-

ing on their perceived informational, controlling, or amotivational significance. Deci and Ryan divide rewards into two categories: task-contingent rewards that are rewards given for participation in an activity, solving a problem, or completing a task; and quality-dependent rewards that involve the "quality of one's performance relative to some normative information or standard" (p. 74). Task-contingent rewards are hypothesized to detrimentally affect intrinsic motivation by decreasing self-determination (i.e., reward is viewed as a controlling event attempting to determine behavior thereby decreasing self-determination and, consequently, intrinsic motivation). Quality-dependent rewards are also believed to act to decrease intrinsic motivation by reducing one's feelings of self-determination. However, quality-dependent rewards also serve to increase feelings of competence according to Deci and Ryan (i.e., reward is viewed as an informational event indicating skill at a certain task, leading to an increase in feelings of competence, which serves to increase intrinsic motivation). Therefore, it is never clear whether the detrimental effect to self-determination or the incremental effect to competence will be stronger in experiments examining quality-dependent rewards. Thus, for Deci and Ryan, quality-dependent rewards may not decrease intrinsic motivation. The detrimental effect of greatest concern is in circumstances involving task-completion rewards.

Eisenberger and Cameron (1996) further divide the task-completion rewards category into the subcategories of performance-independent rewards that individuals receive simply for participation in an activity, and completion-independent rewards given when an individual has finished a task or activity. Cognitive evaluation theory suggests that an individual's intrinsic motivation would be most detrimentally affected upon receipt of tangible, anticipated rewards. Additionally, according to this theory, verbal rewards may be informational, and therefore, increase intrinsic motivation as evidenced by Deci's (1971) findings in Experiment 3. Events may also be perceived as amotivational indicating an individual's lack of skill, which reduces one's cognitions of competence and, subsequently, intrinsic motivation.

In 1988, Rummel and Feinberg conducted a meta-analysis assessing cognitive evaluation theory. They concluded that controlling, extrinsic rewards do have a damaging effect on intrinsic motivation, thus providing support for the theory. Basic problems with cognitive evaluation theory, however, were also identified. First, faulty reasoning was used because rewards were identified as either controlling, informational, or amotivational after performance had been measured. Second, feelings of competence and self-determination, central to the theory as agents for change in intrinsic motivation, are not measurable. The assumption was made that changes were occurring because changes in behavior were observed. The constructs of self-determination, competence, and even intrinsic motivation were inferred from the very behavior they supposedly cause (Cameron & Pierce, 1994). Additionally, the theory contains no explanation for why the anxiety associated with a decrease in self-determination would reduce intrinsic motivation. As Eisenberger and Cameron (1996) write, "based on the theory's premise, one could alternatively argue that reduced self-determination would, for example, reduce preference for the reward or instigate anger at the person delivering the reward" (p. 1156).

Results of a meta-analysis performed by Cameron and Pierce (1994) partly serve to refute cognitive evaluation theory. Deci and Ryan (1985) stress the importance of measurements of attitude because they theorize that interest, enjoyment, and satisfaction are central emotions to intrinsic motivation. How a person feels about an activity is reflected behaviorally as time spent on task. The results of the Cameron and Pierce meta-analysis, however, suggest that reward (and subsequent withdrawal) tends not to affect attitude. These researchers further found that attitude seems to be affected positively when verbal rewards are used, and when rewards are contingent on a precise level of achievement.

Researchers (Cameron & Pierce, 1994; Eisenberger & Cameron, 1996; Eisenberger et al., 1999) have suggested that cognitive evaluation theory is not a useful or viable theory and that any decrements in behavior are better explained through learned helplessness or general interest theory. In learned helplessness, the decrement in intrinsic motivation is said to be

due to the single reward delivery paradigm utilized by most studies in this area. General interest theory suggests that intrinsic motivation is driven by more than just self-determination and competence needs. Eisenberger et al. propose that rewards must be examined for both content and context of tasks. Rewards that communicate task performance and satisfy needs, wants, and desires can increase intrinsic motivation, whereas rewards that convey a message that the task is extraneous to needs, wants, and desires may decrease intrinsic motivation.

The Overjustification Hypothesis

Another experiment designed and conducted to explore the detrimental effects of reinforcement on intrinsic motivation was the work of Lepper, Greene, and Nisbett (1973). These researchers, using Bem's (1967) attributional model, examined individuals currently engaging in a task or activity without the possibility of external rewards. They hypothesized that introduction of extrinsic rewards that can be earned for engaging in that task or activity (i.e., overly sufficient extrinsic pressure) may lead the individual to view his or her actions as extrinsically motivated. Consequently, these individuals may find the activity, in the later absence of these extrinsic rewards, to be of less intrinsic interest (Lepper, 1983).

In this experiment (Lepper et al., 1973), preschool children were chosen based on their high baseline level of interest in drawing. The participants were divided into three groups: an *expected-reward* group, an *unexpected-reward* group, and a *no-reward* group. Children in the first group were promised and received a good-player award contingent upon their drawing with magic markers. Children in the second group received an award, but were not promised it beforehand, and children in the third group did not expect or receive an award.

In subsequent free-play sessions, children from the *expected-reward* group were observed to spend considerably less time drawing than children from the other two groups. The *unexpected-reward* and *no-reward* groups showed slight increases in drawing time. Lepper et al. (1973) concluded that their results provided evidence of an undesirable consequence of the use of extrinsic rewards. However, this con-

clusion does not appear to be supported by the data. If the receipt of the reward were the cause of a decrease in drawing behavior, one would expect both the *expected-* and *unexpected-reward* group to exhibit a decrement in drawing behavior. This was not the case.

In an attempt to explain their results, Lepper et al. (1973) offered the *overjustification hypothesis*. According to this hypothesis, if a person is already performing an activity and receiving no extrinsic reward for that performance, introduction of an extrinsic reward will decrease intrinsic interest or motivation. This occurs because the person's performance is now overjustified, resulting in the person's perception that his or her level of intrinsic motivation to perform the activity is less than it was initially. According to this theory, the person subsequently performs the activity less once the reinforcement is removed (Williams, 1980).

Lepper et al.'s (1973) findings have been supported (e.g., Deci & Ryan, 1985; Greene & Lepper, 1974; Morgan, 1984) except with academic tasks and older students. This suggests that an undermining effect of reward does not occur if the students are told they have achieved a preset standard and the task is at a challenging level for them (Pittman, Boggiano, & Ruble, 1983). Rewards have also been shown to exhibit an additive effect on intrinsic motivation when given dependent upon behavior (e.g., Lepper, 1983), rewards provided information about the students' competence (e.g., Lepper & Gilovich, 1981; Rosenfield, Folger, & Adelman, 1980), and rewards were given to students not optimally motivated toward desirable educational goals (Morgan, 1984). Moreover, researchers have consistently found that verbal rewards tend to increase intrinsic motivation, whereas tangible rewards may decrease intrinsic motivation (Cameron & Pierce, 1994). Additionally, reductions of intrinsic motivation have not been found with traditionally behavioral studies utilizing a repeated measures design (Cameron & Pierce).

Criticisms of Cognitive Research

Methodological Concerns

The findings from the early studies examining the use of external reinforcers have

had a profound effect on education and society. It is important to carefully and objectively examine the methodology. Harlow et al. (1950) concluded that the introduction of an external reinforcer decreased intrinsic motivation. However, the observation period associated with the reward phase in this study was only 5 minutes in duration. As a result, the observed effects may have been limited. Further, and more importantly, Harlow et al.'s subsequent research (see Davis, Settlage, & Harlow, 1950) found differing results. That is, an overall increase in puzzle-solving behavior was observed following the introduction of food and no decrease in puzzle-solving behavior was observed (Zimmerman, 1985).

Cognitive research has also been criticized for failing to make any distinction between rewards and reinforcement. These two terms cannot be used synonymously. A reinforcer is an event that increases the frequency of the target behavior it follows, and a reward is a pleasant occurrence that has not been shown to necessarily strengthen behavior (Cameron & Pierce, 1994). The experiments detailed above (i.e., Deci, 1971; Lepper et al., 1973) utilized only one administration of reward and failed to document the reward used was indeed functioning as a true reinforcer.

Additionally, Feingold and Mahoney (1975) attempted to assess the validity of the cognitive theory of overjustification. They examined the Deci (1971) and Lepper et al. (1973) studies and offered several criticisms of the cognitive research including serious doubts about internal and external validity, and a neglect of current literature on reinforcement contrast. Feingold and Mahoney stated that the Deci and Lepper et al. experiments were not similar to the token economies found in most classrooms at that time. For example, the experimental phases were extremely brief (i.e., a single session), and the reinforcement effect was not reported. These concerns raised questions regarding the external validity of the findings. In addition, the internal validity of the study was criticized due to the observation techniques employed (i.e., nonindependent observers) as well as the marginally significant results reported ($p < .10$). Furthermore, Feingold and Mahoney reported that many of

the cognitive experiments failed to take into consideration the literature on reinforcement contrast that accounts for previous response-consequence experiences. That is, if a behavior is weakly reinforced, then strongly reinforced, and finally, reinforcement is returned to the original weak state, performance suppression may occur. Feingold and Mahoney concluded that "a formerly reinforcing stimulus can become a punisher through relative contrast" (p. 369), a contention virtually ignored by many of the cognitive experiments of Deci and Lepper and colleagues. Finally, many of the cognitive experiments did not take into consideration the role that anticipation of the reward may have played in their findings. This is especially true of the Lepper et al. experiment where one group of children was told they would receive a reward and another group was not. Children in the *unexpected-reward* groups, who would have been expected to show a decrease in interest, actually exhibited a slight increase in pre- to postperformance indicating an increase in intrinsic motivation, and no overjustification effect (Feingold & Mahoney).

Many authors (e.g., Dickinson, 1989) have criticized continued attempts to identify the construct of "intrinsic motivation," suggesting that such efforts impede the goal of the scientific study of behavior. According to Flora (1990), no behavior occurs without an identifying external circumstance:

A complete scientific explanation of behavior does not require reference to constructs which are, in principle, unobservable... A complete scientific account for any behavior of any organism may be obtained with a *complete* description of the functional interdependency of the behavior-environment interaction. (p. 323)

By creating internal constructs that depend upon inferences in their behavioral explanations, some may indeed be obstructing the discovery of the true function of behavior through more scientific, measurable, observable means.

Alternative Explanations

A neglect of behavioral principles that may account for any decrements in observed behavior has been common in the majority of past studies on intrinsic motivation (McGinnis,

1996). Alternative explanations, more behavioral in nature, include anticipated future benefits (Bandura, 1977), intermittent reinforcement (Dickinson, 1989), competing response theory (Reiss & Sushinsky, 1975), behavioral contrast (Bates, 1979; Feingold & Mahoney, 1975), and discriminative stimuli (Flora, 1990).

Reiss and Sushinsky (1975) are especially critical of the overjustification hypothesis, stating that the theory is too vague to be useful for scientific purposes and that competing response theory more adequately accounts for any obtained decrements in intrinsic motivation. Competing response theory suggests that a student's intrinsic motivation may decrease because of other stimuli present in the environment. Students respond to these stimuli, and this results in a decrease of their response to the targeted activity before termination of contingencies occurs. Bates (1979) offers behavioral contrast as an additional explanation for decrements in intrinsic motivation. In this paradigm, two behaviors are reinforced on different schedules. One behavior is then extinguished. This produces an increase in response of the other behavior. The classic example is of the pigeons pecking at different colors. When the reinforcer for pecking at one color is withheld, the pecking at the remaining color increases in rate and intensity. Finally, Flora (1990) discusses the possibility of discriminative stimuli as another explanation. According to this account, behaviors occur in an environmental context. Instead of examining an unobservable construct such as intrinsic motivation, Flora suggests it is more useful to determine the discriminative stimulus and the reinforcers in the environment that maintain a functional relationship. These factors, Flora proposes, maintain a behavior's rate and occurrence.

Additionally, Dickinson (1989) proposed that decrements in intrinsic motivation may occur if the activity is one that participants find boring or uninteresting, rewards are given for activities culturally praised as intrinsically motivated behaviors (e.g., artistic or creative activities), or rewards become aversive stimuli. In the first instance, motivation is decreased because satiation is reached through repeated exposure to sensory reinforcement. In the second illustration, decrement is explained

through an examination of cultural norms. People are often praised if they engage in certain activities that supposedly offer specific intrinsic rewards (e.g., painting, dancing). If an individual is then extrinsically rewarded for this activity, the person may experience a decrease in praise. If praise is reinforcing for that person, he or she may engage in the activity less because the activity is now differentially correlated with the loss of praise. In the third example, the subject may not participate in the activity because they are angry with the experimenter for withholding the reward, they fail to meet the performance standards, or individuals are offered rewards for engaging in nonpreferred activities, and/or threatened with punishment for noncompliance (Dickinson).

Eisenberger and Cameron (1996) also present an interpretation of the specified conditions under which rewards may decrease intrinsic motivation. They state that individuals who receive performance-independent rewards may perceive that they have no control over the reward. This perception may lead to a decrease in performance that may be misinterpreted as a decrease in intrinsic motivation. These authors suggest that the intrinsic interest decrement may be better explained by learned helplessness that asserts that "uncontrollable aversive stimulation results in generalized motivational deficits" (p. 1156). Learned helplessness theory predicts a decrease in intrinsic motivation for performance-independent rewards. However, unlike cognitive evaluation theory, no prediction of a decrement is suggested following task-completion rewards.

Carton (1996) examined the cognitivist assertion that praise appears to increase intrinsic motivation and the delivery of tangible rewards appears to decrease intrinsic motivation. Again, these assumptions are based upon cognitive evaluation theory (Deci & Ryan, 1985). However, operant psychologists' reviews of the literature on the effects of rewards on intrinsic motivation (e.g., Bernstein, 1990; Dickinson, 1989; Flora, 1990; Scott, 1975) reach vastly different conclusions than those conducted by psychologists with decidedly cognitive viewpoints. Important points raised by operant psychologists include the finding that many cognitivists have

presumed that the use of reinforcers decreases intrinsic motivation when in fact the rewards utilized in these particular studies often did not show a clear increase in response rate. Thus, by definition, the use of these presumed rewards was not reinforcement. Furthermore, cognitive studies did not assess response rates for stability, behavioral observations included in most of these studies were often relatively brief, and these studies rarely included follow-up observations. Carton's review of the literature finds little support for examples of a decrease in intrinsic motivation based on the cognitive evaluation theory and reveals three confounding effects: (a) temporal contiguity, (b) the number of reward administrations, and (c) discriminative stimuli associated with reward availability.

The effects of the number of reward administrations (i.e., repeated delivery of rewards is more likely to produce an increase in a target behavior as opposed to a single administration) and discriminative stimuli associated with reward availability (Flora, 1990) have been previously discussed in this article. However, Carton's (1996) notion of the effects of temporal contiguity has not. Temporal contiguity refers to the amount of time between the occurrence of the target behavior and the delivery of the consequence. In an examination of the literature, Carton found time differences between the delivery of tangible rewards and verbal rewards (i.e., praise) in many studies. Most of the verbal rewards were delivered immediately after the target behavior occurred, thereby increasing the likelihood that behavior would be repeated. In contrast, tangible rewards were often delivered days or weeks after treatment, virtually ensuring a decrease in the occurrence of the target behavior. Carton's finding that researchers in those studies have consistently found decreases in intrinsic motivation following the administration of tangible rewards and increases in intrinsic motivation following the administration of verbal rewards then is not surprising.

Behavioral Investigations of Intrinsic/ Extrinsic Motivation

As Flora (1990) offered, "(behavioral) psychology is supposedly the study of individual behavior, not the study of groups means"

(p. 338). This statement succinctly illustrates the importance of within-subject designs in behavioral research. Behaviorally oriented researchers assert that cognitive researchers studying the effects of extrinsic reward using between-group designs have utilized measurement phases that are too short to detect temporal trends or transition states (Cameron & Pierce, 1994). In within-subject designs, however, behavior is measured over a number of sessions, thereby alleviating this shortcoming. Unlike between-group paradigms, within-subject design takes measurements over a number of sessions for each phase. After baseline data are collected, reinforcement is introduced and measurements are again repeatedly taken. Finally, a withdrawal of reinforcement occurs, and measurements of time on task are taken again. Time on task is often used as a measure of intrinsic motivation and the difference in time on task between pre- and postreinforcement is cataloged as intrinsic motivation where differences are attributed to external reinforcement. Behavioral investigations have also traditionally included a follow-up phase during which measures of behavior are taken 2 to 3 weeks after the conclusion of the experiment to assess trends and temporal states.

Behaviorists' use of within-subject repeated measures designs allows determination of whether a reward is actually a reinforcer for a particular individual. Compared to the large number of group studies examining this supposed event, there are very few studies that examine the effects of extrinsic reinforcement from a behavioral standpoint (e.g., Akin-Little & Little, 2004; Davidson & Bucher, 1978; Feingold & Mahoney, 1975; Mawhinney et al., 1989; McGinnis, Friman, & Carlyon, 1999; Vasta, Andrews, McLaughlin, Stirpe, & Comfort, 1978; Vasta & Stirpe, 1979). No study utilizing this methodology has found evidence of detrimental effect of the use of reward.

Akin-Little and Little (2004) attempted to examine the possible overjustification effects of the implementation of token economy for appropriate behavior. Although exhibiting appropriate behavior in a classroom setting may not be seen as intrinsically motivated behavior, many reward contingency systems are used to increase compliant behavior. No previous study used appropriate classroom behavior as the

dependent variable although classroom management and student behavior is a major concern of many classroom teachers. The participants in this study were 3 elementary school students chosen by their teacher as currently high in compliant behavior to classroom rules. The token system was implemented by a regular classroom teacher in a classroom setting. Participants' behavior was analyzed after a Baseline I, reward procedure, Baseline II, and follow-up period. No overjustification effect was found for any of the 3 students (i.e., no student's behavior dropped below Baseline I in either the Baseline II or follow-up phase) similar to the findings of Roane, Fisher, and McDonough (2003).

Using time on task playing a video game as the dependent variable, Mawhinney and colleagues (1989) attempted to differentiate between programmed and unprogrammed consequences and to ascertain whether or not a shift in locus of causality had occurred. During baseline conditions participants were free to choose to play video games or to manipulate a trigger pull task. In the reward phase where students were paid to play the video games without regard for total points scored, Mawhinney et al. posited that if playing the game came under the control of extrinsic (programmed) rewards (i.e., money), the students would play more games, but score fewer points because they would be more concerned about finishing the game in the shortest amount of time to earn the most amount of money. On the other hand, if playing continued to operate under the control of intrinsic (unprogrammed) rewards, students' scores and time playing the game would not be effectively different from baseline levels.

For 2 of the participants, Mawhinney et al. (1989) found that the amount of playing time and points scored did not decrease with the introduction of reinforcement, indicating that the offered reward did not result in a shift of loci of causality (i.e., the participants continued to play the game "for its own sake"). Data from the third student indicated an increase in the number of games played, suggesting a shift in locus of causality from intrinsic to extrinsic rewards. However, although more games were played, the percentage of games won by this participant remained approximately the same.

In their comparison of pre- and postintervention data, Mawhinney et al. (1989) found that amount of quality of play (i.e., playing time and points scored) did not decrease following the introduction of reinforcement across participants. Participants continued to play their preferred video game as much or more during the postreinforcement phase (i.e., Baseline II) as during the prereinforcement phase (i.e., Baseline I). Therefore, the experimenters concluded that providing money for the performance of an interesting task did not decrease intrinsic motivation regardless of the shift of locus of causality. The authors instead suggest an additive model as extrinsic rewards increased overall game performance.

Vasta and Stirpe (1979) asserted that the Lepper et al. (1973) research generated two discrete courses of further research. One trend was concerned primarily with the phenomenon that undermined intrinsic motivation and utilized short-term, single-trial reward conditions. These researchers (Deci, 1971; Lepper et al.; Reiss & Sushinsky, 1975) explained the decline in play activity utilizing several different theories. Lepper et al. applied Bem's (1967) self-perception theory, whereby the introduction of reinforcement adjusts the child's perception of motivation for the behavior from intrinsic to extrinsic, to elucidate their findings. Reiss and Sushinsky suggested that decrements in behavior occur because of competing responses evoked by the introduction of the reward. Finally, Deci's (1975) cognitive evaluation theory has continued to be applied to account for decreases in prescribed activities. Deci's theory asserts that a reevaluation of motivation for one's behavior takes place after extrinsic reinforcement that results in a lowering of intrinsic motivation for the activity. The second competing course of research focused on multiple-trial, long-term reward conditions (i.e., behavioral research methodology). In these studies, the reward is proven to be a reinforcer by its presentation over many sessions, not just one. The focus, then, is on the implications for intervention programs in the applied setting, particularly the school.

Because much of the difficulty in this research rested in determining the definition of intrinsic motivation, Vasta and Stirpe (1979)

employed three dependent variables in their study. Intrinsic motivation was defined as the *amount of time* a child engages in a certain task (Lepper et al., 1973), the *amount of behavior* generated (Feingold & Mahoney, 1975), and the *quality of performance* (Kruglanski, Friedman, & Zeevi, 1971). Vasta and Stirpe measured the effects of reinforcement on each of these dependent variables and found that receiving stars for completion of math worksheets functioned as a reinforcer for the fourth grade school children in the experimental group. More importantly, however, the authors found no evidence of the undermining phenomenon on any of the three dependent variables used as measures of intrinsic interest. Furthermore, the authors insisted that the recommendations by some researchers to decrease the use of incentive programs because of a possible undermining effect "appears unwarranted" (p. 241).

In an earlier study, Vasta et al. (1978) conducted two experiments. The participants were 6 kindergarten/first grade students. The first experiment purposefully chose participants whose interest in the targeted activities (geo-blocks, cardboard puzzles, and copies of pages from a coloring book) was low. The second experiment contained students whose initial interest in the activities was relatively high. Both experiments contained four phases labeled baseline, reinforcement, posttreatment, and follow-up. The coloring book activity was randomly chosen to be reinforced.

As with previous behavioral studies reviewed, the data from these two experiments indicated that the use of classroom-based reinforcement programs was not detrimental to children's intrinsic interest in the activity. The most important aspect of this study was Vasta et al.'s (1978) use of high and low interest groups. Lepper et al. (1973) pointed out that the use of extrinsic reinforcement programs was especially detrimental to children already displaying a relatively high intrinsic interest in the activity. This assertion was not borne out by Vasta's findings, in that children in either the low or high initial interest group did not display decreases in the nonreinforced response rate.

Feingold and Mahoney (1975) assessed 5 second-grade children and attempted to test

the hypothesis that external reinforcement does not have a detrimental effect on children's intrinsic interest in a play activity. Children were given Follow-the-Dots books and the option of either connecting the dots to produce a picture or playing with an Etch-A-Sketch. A repeated measures, within-student design was used and data were collected over a period of four phases: Baseline I, Reward, Baseline II, and Baseline III (i.e., Follow-Up phase, which occurred 2 weeks after Baseline II). Rewards offered included an assortment of candy, toys, and small books that children could win in exchange for points earned by connecting the dots in the Follow-the-Dots books. The reward phase was confirmed to be a true reinforcement phase as it produced a dramatic increase in response for all children. Comparisons between the last four sessions of Baseline I and Baseline II indicated no significant difference. Further, comparisons for each student were made between Baseline I and pooled Baseline II and III performances. Again, no significant differences were found, casting doubt on the assertion that external reinforcement has a deleterious effect on the intrinsic interest of children in a play activity (Feingold & Mahoney). Finally, it should be noted that intrinsic motivation in both the cognitive studies (e.g., Deci, 1971; Lepper et al. 1973) and most of the behavioral studies (e.g., Davidson & Bucher, 1978) was a measurement of time on task.

Recent Debate

Criticism of Cameron and Pierce (1994)

Although this debate originated with Deci's (1971) study, it gained impetus in 1994 when Cameron and Pierce conducted a meta-analysis and concluded that reinforcement did not harm an individual's intrinsic motivation. Subsequently, Cameron and Pierce's findings have been criticized as utilizing flawed methodology (Kohn, 1996; Lepper et al., 1996). Kohn wrote that Cameron and Pierce ignored important findings which suggested that the receipt of tangible rewards is associated with less voluntary time on task as contrasted with the no-reward condition. Kohn further stated that Cameron and Pierce's methodology was flawed

because results from studies in which informational praise was delivered (i.e., no detrimental effects on intrinsic motivation expected), with praise delivered that might be construed as manipulative (i.e., detrimental effects on intrinsic motivation expected) were combined to detect an overall effect. Further, Kohn pointed out that, in his view, the more common type of praise in a classroom is the latter, and, therefore, studies that utilized manipulative praise should be examined separately. Kohn continued his criticism against token reinforcement programs by inspecting studies examining the effects of performance-contingent rewards (PCRs). Kohn refuted the idea that the delivery of PCRs can mitigate the detrimental effect on children's intrinsic motivation by stating that in the majority of programs in "real" classrooms, not all children attain the specified criterion level and still obtain rewards. This is in opposition to research studies in which variables are manipulated so that each participant receives a reward. Therefore, Kohn suggested that a very different motivational effect might be expected in an actual classroom. Kohn concluded by expressing his personal belief that adequate justification exists for schools to avoid the use of incentive programs and simply provide children with informational feedback. This informational feedback alone is expected to increase compliant behavior and work output, and maintain initial levels of intrinsic motivation.

Lepper et al. (1996) characterized Cameron and Pierce's (1994) meta-analysis as being overly simplistic and of little theoretical value. They claimed that Cameron and Pierce misused meta-analytic techniques, and attempted to offer a more nuanced analysis. Similar to Kohn (1996), Lepper et al. stated that the 1994 meta-analysis should have focused on the possible functions of rewards and the possible detrimental implications (i.e., a reward can serve an instrumental/incentive function, an evaluation/feedback function, or function as a social constraint) instead of an overall effect.

Cameron and Pierce (1996) responded to these criticisms by first stating that investigating the overall effect of extrinsic rewards is necessary for practical and theoretical reasons. From a practical standpoint, it is clear that

many parents, educators, and administrators have embraced Kohn's (1993) view that overall, incentive systems are damaging. Many classroom teachers, however, still wish to adopt an incentive program. These teachers are, therefore, interested in whether or not, overall, rewards disrupt intrinsic motivation for completing work or attaining a specified level of performance. The overall effect of reward, then, is critical to educational strategy (Cameron & Pierce). Many academic journals and textbooks point to the theoretical overall detrimental effects of rewards or reinforcement. Consequently, many parents, teachers, and others are loath to use any reinforcement procedure under any conditions. It is necessary then, according to Cameron and Pierce, to analyze the overall effect of rewards because many writers are criticizing the use of incentive programs in educational settings. These criticisms are based upon research findings that some interpret as indicating an overall negative effect. Cameron and Pierce concluded their response by stating that their meta-analysis is the most thorough to date in comparison to other meta-analyses on this topic, specifically Tang and Hall's (1995) analysis that included 50 studies; Wiersma's (1992) analysis that contained 20 studies; and Rummel and Feinberg's (1988) analysis that comprised 45 studies. Each of these analyses reported overall that extrinsic rewards had detrimental effects on intrinsic motivation. These findings were in direct contrast to the conclusions of Cameron and Pierce who stated emphatically that their results, from an analysis of over 100 studies that included all of the relevant studies in this research area, illustrated that rewards can be utilized to maintain or even enhance intrinsic motivation. Further, and more importantly, the conditions under which detrimental effects to intrinsic motivation are exhibited occur under highly circumscribed conditions (e.g., rewards delivered with no set criterion), situations that are easily eschewed by the proper use of token reinforcement programs.

Deci et al. (1999a) and Cameron et al. (2001)

In response to Cameron and Pierce's (1994) meta-analytic findings, Deci et al.

(1999a) conducted a separate meta-analysis to provide a direct test of cognitive evaluation theory. A total of 128 studies were analyzed and separate effect sizes were calculated. The researchers specifically examined verbal rewards (termed "positive feedback") separately from tangible rewards. In addition, further analysis of studies incorporating tangible rewards was conducted, wherein separate effect sizes were computed for unexpected and expected, task noncontingent (i.e., rewards given not for engaging in the task specifically, but for participation in the experiment), engagement contingent (i.e., rewards given for participation in the task), completion contingent (i.e., rewards given for completion of the task), and performance contingent (i.e., rewards given only for performing the task well, or surpassing a previously set standard). Furthermore, the results were divided based on participant population (i.e., child versus college student). Not surprisingly, a decrement in intrinsic motivation, measured by time on task for 101 of the studies and self-report of interest for 84 of the studies, was found in every category except verbal rewards and unexpected rewards. Deci and colleagues (2001) argued that the results of their meta-analysis provide support for cognitive evaluation theory and confirm the substantial undermining effects following the use of external rewards. Deci et al. evinced the importance of considering the interpersonal context in the delivery of verbal reward specifically (i.e., rewards delivered in a controlling manner will tend to decrease intrinsic motivation whereas rewards delivered in a noncontrolling manner will tend to increase feelings of competence and, hence, intrinsic motivation).

Although verbal rewards enhanced the intrinsic motivation of college students (i.e., significant increase), the delivery of verbal rewards did not enhance children's intrinsic motivation. Based on these findings, Deci et al. (2001) cautioned about the use of verbal reward in the classroom: "verbal rewards are less likely to have a positive effect for children ... (they) can even have a negative effect on intrinsic motivation" (p. 9). This is misleading. The importance and effectiveness of teacher attention particularly in the form of verbal praise has been documented (Drevno et al., 1994; Maag & Katsiyannis,

1999; Parrish, Cataldo, Kolko, Neef, & Egel, 1986; Valcante, Roberson, Reid, & Wolking, 1989). The assertion that verbal praise should not be utilized in a classroom setting is in direct opposition to the available data.

Deci et al. (1999a, 2001) examined age effects on tangible rewards in the task engagement category. They found that although both college students and children experience decrements in intrinsic motivation after the use of external reward, it is worse for children. Based on these findings, they wrote:

Tangible rewards, both material, such as pizza parties for reading books, and symbolic rewards, such as good student awards are widely advocated by many educators and are used in many classrooms, yet the evidence suggests that these rewards tend to undermine intrinsic motivation for the rewarded activity. Because the undermining of intrinsic motivation by tangible rewards was especially strong for school-aged children....the findings from this meta-analysis are of particular import for primary and secondary school educators. (Deci et al., 2001, p. 15)

This finding is in direct contrast to a study conducted by Flora and Flora (1999) who examined the reading habits of college students who reported having been rewarded for reading as an elementary school student by participating in the "Book It" program. No detrimental effect was found on college students' reading habits after having been rewarded for reading as a youngster.

In the most recent meta-analysis, Cameron et al. (2001) synthesized 145 studies using categorizations similar to those adopted by Deci et al. (1999a). They found, in general, that rewards do not decrease intrinsic motivation. Although the sample was not homogeneous, an overall effect size was calculated. Cameron (2001) stated this overall effect is important because educators and other school personnel often report that **all** rewards are harmful on motivation. Contrary to Deci et al. (1999a), Cameron et al. included the categories of high and low initial interest. Notably, they found that rewards can enhance intrinsic motivation, particularly if measured as time on task. This is in accordance with Bandura's (1986) finding that most activities have little initial interest for people, but that engagement in the activity may increase interest. This has

important implications for schools as many children do not find academic tasks initially appealing. The use of reward then may be used to increase students' time on task and intrinsic motivation for a task. Cameron et al. did not find detrimental effects with the use of verbal praise for either children or college students. Instead, they found significant increases.

In terms of tangible reward, no detrimental effect was found for unexpected rewards or for rewards that were closely tied to specific standards of performance and to success. Detrimental effect was found when rewards were not explicitly connected to the task and signified failure. This last finding is also important to educators who may be attempting to use reinforcement to increase either social or academic behavior. Oftentimes, teachers will set the goals for a student too high. Behavioral principles state that it is important to shape behavior, reinforcing the child's current competencies and giving him or her a chance for success.

It is also important to remember that neither of these meta-analyses examined the results of behavioral studies (e.g., Feingold & Mahoney, 1975). Again, **none** of the studies that utilized single case design found any detrimental effects with the use of reinforcement contingencies. This is significant as those studies tend to more typically mimic the use of reward contingencies in classrooms. Perhaps if additional behaviorally oriented studies were conducted, there would be no detection of the supposed detrimental effects of reward delivery on any task or behavior.

Best Practices in the Use of Reinforcement Procedures in the Classroom

In 1991, the National Education Association published a document entitled *How to Kill Creativity* (Tegano et al.) that stated:

The expectation of reward can actually undermine intrinsic motivation and creativity of performance... A wide variety of rewards have now been tested, and everything from good-player awards to marshmallows produces the expected decrements in intrinsic motivation and creativity of performance.... (making) them (students) much less likely to take risks or to approach a task with a playful or experimental attitude. (p. 119)

A review of several educational psychology books (Slavin, 1997; Woolfolk, 2004) reveals a more balanced view of the effects of rewards by including the findings of Cameron and Pierce (1994), along with Deci and Ryan (1985) and Lepper et al. (1973). This is an encouraging sign because many of the findings in this area support the effectiveness of reinforcement procedures in the classroom and many researchers have criticized the literature on supposed damaging effects (e.g., Bandura, 1986; Bates, 1979; Dickinson, 1989; Flora, 1990).

Additionally, any detrimental effects of the use of extrinsic reinforcement can be easily avoided with the use of these guidelines. Rewards should not be presented for mere participation in a task without regard for completion or quality. Decrements have also been found in the literature when rewards are presented on a single occasion. This is not the most common method utilized in classrooms. In general, reward contingencies used in schools are presented repeatedly with appropriate thinning of schedules utilized when behavior change has occurred. School psychologists are advised to heed this advice when consulting and planning with teachers on the use of reinforcers in the school setting.

Specifically, school psychologists are often asked to aid in increasing the frequency of a number of student behaviors (e.g., math, reading, homework) for which the baseline level of performance is close to zero (i.e., the "unmotivated" child). Maintaining a perspective that these students "should" engage in certain behaviors because of "intrinsic" motivation is unlikely to result in a change in the level of performance. Instead, the efficacious response includes selecting the target behavior(s), determining the current and desired level of functioning, and delivering reinforcers based on a set criterion. This criterion changes as the behavior improves. This entire procedure is based on the principles of shaping through reinforcement of successive approximations of the desired behavior. This practice has been used with both performance and acquisition deficits, with acquisition deficits requiring a slightly different schedule (i.e., continuous) of reinforcer delivery in the initial learning stages. Additionally, to insure that extrinsic rewards have true reinforcing value,

the use of a Reinforcer Preference Survey (Northrup, George, Jones, Broussard, & Vollmer, 1996) has proven efficacious.

Teachers continually request training in behavior and classroom management techniques (Maag, 1999, 2001) such as the procedures discussed above. The irony is that techniques that aid teachers in improving their management skills have existed since Skinner's (1953) seminal work on the principles of operant conditioning. Techniques based upon the use of extrinsic reinforcers (i.e., positive reinforcement) work in the classroom. These include verbal praise, token economies, group contingencies, contracts, and others (Maag & Kotlash, 1994). The question is why teacher education programs are not incorporating these principles into their curriculum. Why is there such resistance to the data? Axelrod (1996) suggested that some causes for the lack of both professional and popular acceptability (e.g., Kohn, 1993) may be that the use of positive reinforcement consumes too much time, attempts to eliminate human choice, and there is little compensation for educational personnel for using these procedures. This is a somewhat discouraging view and one can only hope that future and current teachers, educational personnel, and teacher training faculty make evidence-based decisions when choosing intervention for children and youth.

The polemical papers on both sides of this extrinsic/intrinsic issue, their rebuttals, and the further replies are gradually bearing out a common "bottom line"—the programs that show increased intrinsic motivation are those programs that incorporate the elements of good, comprehensive behavioral intervention: relatively immediate reinforcement, generalization strategies, and individualized intervention. The implication is that any blanket rejection of programmed reinforcement strategies is entirely unwarranted and programmed reinforcement strategies, like any other instructional strategy, should be undertaken in a thoughtful manner after considering the many variables of any classroom situation.

Future Research

There are a number of areas where future research is warranted. First, research should be

designed that attempts to inspect the Lepper et al. (1996) hypothesis that intrinsic motivation is strengthened under certain extrinsic reward conditions (e.g., reward indicates success and increased feeling of competence) or intrinsic motivation is decreased under less favorable extrinsic reward conditions (e.g., constraints or social control function). Studies in this area will need to focus on the conditions under which behavioral decrements are a result of decreases in "intrinsic" motivation or environmental factors (e.g., schedules of reinforcement delivery, controlling for the value of different rewards, and behavioral contrast). As Carton (1996) wrote, "choosing between an explanation based on intrinsic motivation versus one based on environmental variables is a decision that can lead to very different conclusions" (p. 247).

Another promising area is the re-examination of seminal studies (e.g., Deci, 1971; Lepper et al., 1973) using both the original methodology and a repeated measures design. The first and fourth author are currently involved in a project that is attempting to replicate the Lepper et al. study. At the conclusion, that same study (i.e., observing children who currently draw, rewarding them, and then observing their behavior post-reward) will be conducted utilizing a repeated measures design including a follow-up phase. Future research should attempt to ascertain the validity of theories such as the cognitive evaluation theory and the overjustification effect using methodology similar to that described above. Only through an examination of behavior across time can the true effects of the use of reinforcers be determined.

Intrinsic motivation has been defined as behaviors performed in the absence of observable external reinforcement. Defining any construct in terms of what it is not does little to advance the course of science. Further studies may eventually show the necessity of examining whether or not intrinsic motivation is a useful concept to study or whether it even exists. There is an extensive literature supporting the efficacy of behavioral interventions in a variety of settings. Perhaps the time has come to accept these findings and cease attempts to damage these data by offering alternative, in-

validated conclusions. Perhaps it will then be possible to avoid Skinner's (1953) epistemological criticism of hypothesized inner causes. No longer will we be content with attributing behavior to "intrinsic motivation," but we will search for the environmental factors that are the ultimate causes of behavior. In this light, the debate over detrimental effects of reward can be seen as being due in large part to confusion over valid candidates for causes.

Conclusion

Behavior analysts have spent their time exploring the variables that affect the efficacy of reinforcement. They have always admitted that under certain circumstances reinforcement is more effective (e.g., in the presence of an establishing operation; Michael, 1993) or less effective (e.g., when discriminative stimuli are not present to signal the availability of reinforcement). Cognitive researchers have focused on those instances when reinforcement is less effective, and attributed this lack of efficacy to a general problem with programmed reinforcement, claiming that such reinforcement alters an inner propensity called intrinsic motivation. In examining the methodology of these experiments, however, it often becomes clear that the reinforcement programs are simply *bad programs*—that is, they do not exploit those strategies that we know make for effective reinforcement programs. When tangible rewards are not delivered immediately after behavior, when an individual's baseline performance is not taken into account in intervention design (as in when students who are already performing a task at a high frequency are put on programmed reinforcement), and when generalization strategies are not used, it is hardly surprising that "intrinsic motivation" is lowered. The logical solution is not to eliminate programmed reinforcement, but to use *effective* programmed reinforcement strategies.

Bribery is defined in the dictionary as an inducement to engage in illegal or inappropriate behavior (Woolf, 1980). When education personnel, including school psychologists, extol the use of extrinsic reinforcement in the classroom, the motive is clearly not to "bribe" children and youth, but to increase appropriate academic and social behavior. The goal is obviously not to

decrease intrinsic motivation, although it is unclear that the construct exists or is useful in the science of psychology. It is apparent through an examination of the data that any decrease occurs under specifically circumscribed conditions, conditions that are easily avoidable. Best practice would suggest that children and youth deserve interventions based on sound, empirical findings. The positive effect of the use of reinforcers in the classroom is one such conclusion.

If teachers are implementing "reinforcement" programs without knowing how to do so, the worries of intrinsic motivation researchers seem reasonable. But it is the practice and not the principle that is suspect and open to misapplication and abuse, and the corresponding prophylactic is *more* teacher training in behavioral methods, not less. In the meantime, we can only try to correct the misconceptions that have led to unwarranted criticism of programmed reinforcement, and take some solace in the fact that classroom teachers will continue to learn from contingent consequences what works and what does not.

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TITLE: Extrinsic Reinforcement in the Classroom: Bribery or
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SOURCE: Sch Psychol Rev 33 no3 2004

WN: 0400300759003

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