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Effects of extrinsic reward conditions on students' intrinsic motivation: implications for teachers

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Effects of extrinsic reward conditions on students' intrinsic motivation: implications for teachers

Abstract
This research paper is a review of literature on the effects of rewards on intrinsic motivation. Two recent meta-analytic studies are reviewed and compared in terms of their conflicting findings. Studies that examine specific conditions in which rewards may enhance or undermine students' intrinsic motivation are reviewed. These selective studies include research on verbal rewards, noncontingent, tangible, expected rewards, and contingent, tangible, expected rewards. Suggestions for future research are made.
Effects of Extrinsic Reward Conditions on Students’ Intrinsic Motivation: Implications for Teachers

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ABSTRACT

This research paper is a review of literature on the effects of rewards on intrinsic motivation. Two recent meta-analytic studies are reviewed and compared in terms of their conflicting findings. Studies that examine specific conditions in which rewards may enhance or undermine students' intrinsic motivation are reviewed. These selective studies include research on verbal rewards, noncontingent, tangible, expected rewards, and contingent, tangible, expected rewards. Suggestions for future research are made.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER 1</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>3</td>
</tr>
<tr>
<td>Definitions</td>
<td>4</td>
</tr>
<tr>
<td>Motivation</td>
<td>4</td>
</tr>
<tr>
<td>Intrinsic Motivation</td>
<td>5</td>
</tr>
<tr>
<td>Extrinsic Motivation</td>
<td>6</td>
</tr>
<tr>
<td>Overjustification Effect</td>
<td>6</td>
</tr>
<tr>
<td>Reinforcement Theory</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER 2</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meta-Analytic Studies Review</td>
<td>11</td>
</tr>
<tr>
<td>Cameron and Pierce Review</td>
<td>11</td>
</tr>
<tr>
<td>Design Considerations</td>
<td>12</td>
</tr>
<tr>
<td>Between-Group Design</td>
<td>12</td>
</tr>
<tr>
<td>Within-Subject Design</td>
<td>13</td>
</tr>
<tr>
<td>Advantages and Disadvantages</td>
<td>14</td>
</tr>
<tr>
<td>Variation in Independent Variables</td>
<td>15</td>
</tr>
<tr>
<td>Measures of Intrinsic Motivation</td>
<td>17</td>
</tr>
<tr>
<td>General Findings</td>
<td>20</td>
</tr>
<tr>
<td>Findings Under Different Reward Conditions</td>
<td>20</td>
</tr>
<tr>
<td>Tang and Hall Review</td>
<td>22</td>
</tr>
<tr>
<td>Variation in Independent Variables</td>
<td>23</td>
</tr>
<tr>
<td>Measures of Intrinsic Motivation</td>
<td>25</td>
</tr>
<tr>
<td>Findings</td>
<td>25</td>
</tr>
<tr>
<td>Comparison of Cameron &amp; Pierce and Tang &amp; Hall Findings</td>
<td>28</td>
</tr>
<tr>
<td>Verbal Rewards</td>
<td>33</td>
</tr>
<tr>
<td>Noncontingent, Tangible, Expected Rewards</td>
<td>43</td>
</tr>
</tbody>
</table>
CHAPTER 1

Introduction

Since the start of compulsory education in the late 1800s, educators have struggled with how to successfully motivate students (Lepper, 1983). Students who had perhaps never attended school before were now being forced to attend. Teachers had to develop new ways to motivate these children to learn such as using corporal punishment. Since then, the tide has greatly shifted to more appropriate ways to motivate students from corporal punishment to the use of rewards (Lepper, 1983). Slapping students' hands with rulers and spanking has now been replaced with more socially acceptable measures. Rewards such as stickers, free time, and extra credit are now being used in many classrooms to motivate students to perform academically.

Over the last several decades operant conditioning has significantly impacted the field of education. The concepts of reinforcement and punishment are commonly taught in college and university education classrooms. As a result, classroom teachers often use reward and punishment techniques to motivate their students (Cameron & Pierce, 1994). The tide, however, has been shifting again and there has been a growing debate surrounding the issues of how and
when rewards should be used to enhance motivation and academic performance in the classroom.

Fueling the debate has been the work of several researchers that suggest rewards may have detrimental effects on individuals. These researchers argue that reinforcement may decrease a person’s motivation to participate in a desired activity (Deci, 1975). For example, according to these researchers when a student who enjoys reading books is externally reinforced to read by being given stickers or a longer recess, the student may choose to read less in the future once the application of the reward is discontinued.

Although the argument that rewards can actually undermine the motivation of students to learn appears to be winning the hearts and minds of many educators, empirical support for the hypothesis is mixed. For example, a study by Deci (1971) found that tangible rewards can decrease motivation. Offering money for solving puzzles was found to decrease future time spent working on puzzles.

However, a study by Vasta, Andrews, McLaughlin, Stirpe, and Comfort (1978) found different results. This study involved students participating in a coloring task. When the subjects were witnessed coloring they were given praise
and a star. Results showed that, with the introduction of the rewards, time spent coloring increased.

Recently, there have been two meta-analytic studies done that have attempted to make sense of the conflicting findings. Meta-analysis is a statistical technique used to summarize the results of many studies which have investigated the same topic. The end result of conducting a meta-analysis is to provide an "average" result of all the studies examined (Gay, 1996). Cameron and Pierce (1994) conducted a meta-analytic study and concluded that overall extrinsic rewards do not decrease intrinsic motivation. They also found that under certain conditions, rewards such as verbal praise can increase subjects' intrinsic motivation. A decrease in intrinsic motivation was found under one specific condition. In 1995, another meta-analytic study by Tang and Hall concluded that intrinsic motivation can be undermined under more than one specific condition.

Statement of the Problem

Given these complex and apparently conflicting set of research findings, educators are in need of practical guidelines for how to motivate students to learn. In this paper I will address two questions: (a) Under what specific conditions do rewards either reduce or enhance intrinsic
motivation? (b) What are the practical implications for motivation in the school setting? This paper will begin with current definitions of motivation, intrinsic motivation, extrinsic motivation, and the overjustification effect. I will then review two meta-analytic studies, current research findings, and state implications for future research.

Definitions

Motivation

There have been numerous definitions of motivation put forth in the literature. A particular definition depends on what theoretical perspective you come from. For example, behaviorists define motivation as "an increased or continual level of behavioral responses to stimuli brought about by reinforcement" (Pintrich and Schunk, 1996, p.4). Individuals will exhibit a behavior because they have been given something pleasurable for it in the past. Behaviorists conceptualize motivation in terms of behavior that is observable. They are not concerned with the beliefs or feelings of the individual (Stipek, 1998).

Cognitive theorists state that motivation is "the process whereby goal-directed activity is instigated and sustained" (Pintrich and Schunk, 1996, p.4). Because motivation is seen as a process it is not directly
observable. Cognitivists stress the importance of one's thoughts, beliefs, and emotions in motivation. Inferences about motivation are made based on one's choices and by what they say. Goal setting is also a part of motivation. Goals provide a direction for the person to act (Pintrich and Schunk, 1996). In the classroom, the most important goals are those related to learning and achievement. Cognitive theorists describe two different ways in which people can be motivated. They can be intrinsically motivated or extrinsically motivated.

**Intrinsic Motivation**

Deci (1975) defined intrinsically motivated behaviors as those for which the rewards are internal to the person. Individuals pursue an activity for the pleasure and satisfaction they receive from their performance. "The activities are ends in themselves rather than means to an end" (Deci, 1975, p. 23). They engage in activities freely, and with a sense of personal choice (Deci & Ryan, 1985). If an individual is intrinsically motivated then they do not need external rewards or incentives to begin or complete a task. Reinforcement comes from within the individual rather than externally, from the outside.
Extrinsic Motivation

Extrinsically motivated behaviors, on the other hand, can be defined as those in which the person engages in to receive some reward external to the person. It is "motivation to engage in an activity as a means to an end" (Pintrich and Schunk, 1996, p. 258). For example, a student completes his assignment because he will receive one dollar from his parents. A person is extrinsically motivated if he or she works on a task purely for the sake of attaining a reward or for avoiding some punishment (Deci, 1975). Rewards can be tangible, such as money or candy, or intangible, such as verbal praise or a smile from the teacher.

Overjustification Effect

Lepper, Greene, and Nisbett (1973) created the term "overjustification effect" to explain the detrimental effects of rewards on intrinsic motivation. They stated that intrinsic interest is undermined when someone participates in a previously interesting activity to obtain some extrinsic reward. The extrinsic rewards lead to a perceptual shift in causality. Before rewards are presented, participating in an intrinsically interesting activity is perceived as self-initiated. They are doing the task because they want to. When a reward is introduced,
participation in that activity becomes based on receiving that reward. The reward, in fact, "overjustifies" their participation. When that reward is removed people lose their justification, or motivation for participating in the activity. Therefore, it is thought that future intrinsic motivation to perform that activity will decrease.

The overjustification effect is supported by early studies conducted by Deci (1971) and Lepper et al. (1973). Twenty-four college students participated in Deci’s study. All subjects were asked to work on a puzzle task that was thought to be interesting. In the first session the subjects were given 13 minutes to solve each of four puzzles. In the second session twelve subjects in the experimental group were told they would be given a dollar for each puzzle they solved. The twelve subjects in the control group were not offered a reward. The students’ intrinsic motivation was then measured by the amount of time spent working on the task in the final session. The results indicated that the experimental group, those who were rewarded, spent significantly less time on the task during the final session than the control group (Deci, 1971.)

In 1973 Lepper et al. conducted a study that examined the effects of rewards on nursery school children. The children were put into one of three experimental conditions:
(a) expected-reward, (b) unexpected-reward, or (c) no reward. In the expected-reward condition subjects were given a reward for drawing. In the unexpected-reward condition the subjects received the reward, but did not know they would, and in the no reward condition the subjects did not expect or receive a reward. Results showed that in the free play session, when the reward was no longer present, the subjects in the expected-reward condition spent significantly less time drawing than the other two groups (Lepper et al., 1973).

The overjustification effect came into direct conflict with behaviorism, specifically reinforcement theory. Stipek (1998) states that views on intrinsic motivation and motivation based on external rewards can compete with each other. This caused some controversy over whether rewards are considered harmful or helpful.

Reinforcement Theory

Researchers in the behaviorist camp support the notion that behavior can be controlled through the use of reinforcers (rewards) and punishment. According to behaviorists, motivation is determined by environmental cues. Such theorists state that when individuals are given a positive reinforcer (or reward) for a particular behavior, that behavior becomes reinforced and they will, therefore,
continue to engage in that behavior in the future (Stipek, 1998). For example, students who are given a reward that acts as a reinforcer for completing their homework will continue to complete their homework in the future.

Skinner (1974) coined three terms that are the basis for the reinforcement theory: positive reinforcement, negative reinforcement, and punishment. Positive reinforcement is providing something that will in turn increase the probability that the desired behavior will occur in the future. Negative reinforcement is the act of taking something away to increase the probability that the desired behavior will again occur. Punishment is when one provides consequences that will eliminate an unpleasant behavior.

Accordingly, a reinforcer that is made contingent on a behavior will cause an increase in that behavior. When a reinforcer for the particular behavior is withdrawn, the behavior should return to the same level before the reinforcer was given. It should not decrease below that as Deci (1971) and Lepper, et al. (1973) suggest in their studies (Stipek, 1998).

Several alternative explanations have been offered by behaviorists to explain why a decrease in a desired behavior might occur after the presentation of a reward. One
explanation is that what may be seen as a decrease in intrinsic interest may be satiation. Children may not want to continue an activity following immediate and repeated performance. Behaviorists suggest that satiation would not be a factor if there was a substantial interval following the initial rewarded behavior. Another explanation is labeled as "negative contrast". When a reward is suddenly removed it could produce a temporary, but not permanent, lower level of performance due to an aversive emotional reaction (Eisenberger and Cameron, 1996).

Behaviorists have also critiqued many of the studies which provide the empirical basis for the overjustification effect for failing to make a clear distinction between reward and reinforcement. The term reward is often used interchangeably with positive reinforcement and reinforcer. While rewards are assumed to increase or strengthen a desired behavior, they have not been identified so empirically. Reinforcers, on the other hand, are only considered so when shown through observation to increase behavior. Research that has examined the overjustification effect has rarely empirically demonstrated the rewards used as actual reinforcers (Pittenger, 1996). According to this argument, when rewards are shown to decrease intrinsic
motivation than a possible explanation could be that the rewards used were not actually reinforcers.

CHAPTER 2

Meta-Analytic Studies Review

The recent meta-analytic studies will be reviewed in terms of design considerations, research questions, independent and dependent variables that were examined, and their overall findings.

Cameron and Pierce Review

Cameron and Pierce conducted their meta-analytic study in 1994. Ninety-six experimental studies were used in their main meta-analytic study. Their stated purpose for conducting the meta-analysis was to make a causal statement about what effects rewards and reinforcement have on intrinsic motivation. They presented three research questions: (a) Overall, what is the effect of reward on intrinsic motivation? (b) What are the effects of specific features of reward on intrinsic motivation? (c) Overall, what is the effect of reinforcement on intrinsic motivation? (Cameron and Pierce, 1994 p. 373). The studies used in the meta-analysis were chosen by conducting a computer search of psychological literature. The term intrinsic motivation was used to start the search. To address the first two questions only studies with between-group designs, in which
the measure of intrinsic motivation of rewarded subjects were compared to nonrewarded subjects, were included. To address the third question, a separate meta-analysis was conducted on five studies that used a within-group design.

Design Considerations

**Between-Group Design**

In a between-group design, different subjects participate in different levels of the independent variable. Typically, one half of the subjects participate in the experimental group in which they receive an external reward, and the other half of the subjects are assigned to a group where they do not receive the reward. Within this design there has been one of two methods used: before-after designs and after-only designs (Tang and Hall refer to them as three-session designs and one-session designs respectively.). In the before-after design the researcher first collects a baseline measure of all the participants' intrinsic motivation for a particular task. The baseline measure is collected in order to determine which subjects show interest in the task. Typically, those that spend the most time on the task are chosen to participate in the study. Subjects are then assigned to a reward or no reward condition, and an external reward is given to the experimental group only. In the final session the reward is
withdrawn and the subjects' intrinsic motivation is again measured. The difference in the after-only design is that the researchers do not get an initial baseline measure of the subjects' time on task. The experiment begins with presenting the subjects with a task that is assumed to be intrinsically interesting (Cameron and Pierce, 1994; Tang and Hall, 1995).

**Within-Subject Design**

In a within-subject design all subjects participate in all levels of the experimental treatment. Subjects are exposed to both nontreatment and treatment conditions. During each phase performance is repeatedly measured. Initially, subjects' intrinsic motivation for a task is repeatedly measured. Then an external reward is presented to all subjects over a number of sessions. In the final phase, the reward or reinforcement is withdrawn and intrinsic motivation is measured over a number of sessions by the time spent working on the task. Differences in intrinsic motivation are measured by comparing pre- and postreinforcement levels of intrinsic motivation. Differences are presumed to be due to the extrinsic reward (Cameron and Pierce, 1994).
Advantages and Disadvantages of Between vs. Within Group Designs

One advantage of the between-group design is that, generally, they employ a comparison group so the subjects do not have to serve as their own controls. There are also critics of between-group design research. Mawhinney (1990) argued that in this design, measurement phases tend to be too short in time to detect temporal trends or transition states. Another criticism is that some researchers will assume the external reward presented is a reinforcer. The problem occurs when the researchers have not initially established that the reward actually increases the frequency of desired behavior. If the reward does not increase frequency of behavior then it can not be considered a reinforcer (Cameron and Pierce, 1994).

One cited advantage of the within-subjects design is that it can be determined whether the rewards used are indeed reinforcers. The rewards are presented over a number of sessions to determine the effect on behavior. If it increases behavior then it can be considered a reinforcer. Researchers can then make statements referring to the effects of reinforcement rather than reward (Cameron and Pierce, 1994). One disadvantage of the within subject design is the lack of a comparison group. Deci and Ryan
(1985) suggested that because the sample is generally much smaller than that used in between-group design, it could be more difficult to get a representative sample and statistically significant effects. If researchers are unable to get a representative sample then results are not as generalizable.

**Variation in Independent Variables**

In the studies analyzed by Cameron and Pierce there were three independent variables that were manipulated: (a) reward type, (b) reward expectancy, and (c) reward contingency. The type of rewards used in the studies were either tangible or verbal. Examples of tangible rewards would include money, candy, or awards. Verbal rewards refer to praise or compliments. Reward type is considered a variable that will affect intrinsic motivation. Rewards can serve two functions. They can either be controlling or informational. Rewards are considered controlling if they are perceived by someone as exerting control over their behavior. They engage in the activity because they will receive a reward. Informational rewards are those that provide feedback about how well one is doing on the task or how one's performance compares to others. In this situation, it is assumed people will continue working on the task because they are being informed about their
performance. While tangible rewards are predicted to serve a controlling function, verbal rewards can be informational. When rewards are controlling the overjustification effect is predicted to occur because when rewarded, people perceive themselves as doing the task because they will get a reward. When the reward is removed, they no longer have a reason for doing the task.

Reward expectancy refers to whether or not the subjects know ahead of time that they are going to receive a reward. If the reward is expected, then the subjects know before they participate in the activity that they will receive the reward. If the reward is unexpected, then the subjects do not know before participation in the activity that they will receive a reward. It is thought that overjustification will occur when the reward is expected because subjects are more likely to make the connection between receiving the reward and doing the task. When the reward is unexpected, the overjustification effect should not occur because the subjects are not able to make a connection between the reward and task.

Reward contingency refers to the conditions the subject must satisfy in order to receive a reward. When subjects are given a reward just for participation, regardless if they complete the task, it is referred to as a noncontingent
reward. An example would be giving a reward for spending 10 minutes looking at a book. Task-contingent rewards are those given to subjects for simply completing a task. A task-contingent reward would be giving a reward for reading an entire book. Performance-contingent rewards are given for attaining a specified level of performance. In this situation the person would have to read the book and be able to explain the plot of the story correctly in order to receive the reward. Reward contingency is thought to be an important variable in affecting intrinsic motivation because people must be able to make a connection or link between the reward and what they are asked to do in order for them to shift their reasons for participating in the task.

Measures of Intrinsic Motivation

In the studies reviewed by Cameron and Pierce intrinsic motivation was measured one of four different ways: (a) time spent on task during free time (b) attitude toward the task, (c) level of performance during free time, and (d) the willingness of subjects to volunteer for future projects without being rewarded. The time spent on task during free time refers to how long subjects spend on task during a free time period. The free time period refers to when the subjects are given the opportunity to choose an activity to engage in. They either spend time on the same activity they
engaged in when the reward was presented or choose to engage in other activities. The researchers are assuming that when a subject chooses a task to work on it is a task that they enjoy and want to work on regardless if they will receive a reward for working on it.

The attitude toward the task measure refers to a self-report that is filled out by the subjects. They report on such things as task enjoyment, interest, and satisfaction. Performance during free time is measured by the number of tasks completed, such as the number of puzzles solved. Willingness to volunteer in the future is measured by whether the subjects state they would volunteer for a similar study in the future without receiving rewards. These four measures are taken after rewards have been presented and removed from the experimental group. (Cameron and Pierce, 1994).

A rationale has been made for why these variables are used to measure intrinsic motivation. The general operational definition of intrinsic motivation is that "an activity is intrinsically motivated if there is no apparent external reward for the activity" (Deci, 1975, p. 148). This definition, and the measure of time spent on task during free time, seem to concur. In the free choice situation there is no external reward to be gained by
participating in the task. Time on task is a relevant measure because people will spent more time on activities they find intrinsically motivating, rather than activities they do not like.

Being intrinsically motivated also refers to enjoying the activity and finding it interesting. In this case, self-report measures of task enjoyment and willingness to volunteer in future studies would seem to be appropriate measures of intrinsic motivation (Deci, 1975). If intrinsically motivated then one would participate in an activity they wouldn't get rewarded for. Therefore, if a subject stated they would volunteer for another study without receiving a reward it can be assumed that they found that task intrinsically interesting.

A study by Kruglanski, Freedman, and Zeevi (1971) used both a performance measure and self-report measure to determine intrinsic motivation. The rewarded subjects showed a lower performance level as well as provided lower ratings of task enjoyment than nonrewarded subjects. This would provide some support that performance level could also be an effective measure of intrinsic motivation. If a subject finds a task intrinsically interesting than they would care about how well they perform. They would want to do a good job. Those that take time to perform the activity
correctly would be intrinsically motivated because of the satisfaction they would receive from their performance.

General Findings

Cameron and Pierce report that when distinctions between what type and how a reward is presented are not made, reward does not decrease a person's intrinsic motivation regardless of how it is measured. Indeed, they report that overall, studies indicate that subjects who received verbal rewards show an increase in intrinsic motivation. These subjects spent more time on the task after receiving the verbal reward, and also stated more interest and enjoyment in the task than non-rewarded subjects. In the second analysis Cameron and Pierce reported that reinforcement does not decrease an individual's intrinsic motivation. Cameron and Pierce concluded from their meta-analyses that in general reward or reinforcement does not harm intrinsic motivation.

Findings Under Different Reward Conditions

When looking at specific reward conditions, Cameron and Pierce found that tangible rewards, when received unexpectedly, did not produce a decrement in intrinsic motivation. When examining the effects of tangible, expected, task-contingent rewards, no significant effect was found on either the time on task or attitude measure.
Tangible, expected, performance-contingent rewards did not produce a significant effect according to the time on task measure, however, an increase in intrinsic motivation was found according to the attitude measure. The only situation in which a decrease in intrinsic motivation was found was when subjects were given expected, tangible, noncontingent rewards. This decrease in intrinsic motivation was measured by time on task after the reward was withdrawn. The same condition had no affect on intrinsic motivation when measured by self-report of the subjects' attitude.

It is difficult to explain these findings using the overjustification effect. While those that support the overjustification effect would predict the effect to occur in several situations, Cameron and Pierce's findings did not show this. For example, verbal rewards produced an increase in intrinsic motivation. Because these rewards did not lead to a decrease in intrinsic motivation they could have provided information to the subjects such as how they were performing. The verbal rewards could have been provided unexpectedly so the subjects were unable to make a connection between the reward and participation in the task.

According to these findings tangible, expected, task-contingent, and performance-contingent rewards did not decrease intrinsic motivation. A possible explanation could
be that these situations were not separated by initial high or low interest level. The overjustification effect would be most likely to occur when subjects participate in high interest activities. High interest activities would be those that subjects would be most willing to spend their time doing. Possibly, the majority of the studies involved low interest activities where intrinsic motivation was already low.

Tang and Hall Review

Tang and Hall (1995) used 50 experimental studies to examine the overjustification effect. As stated earlier, the overjustification effect occurs when the withdrawal of a reward leads to a decrease in intrinsic motivation. Like Cameron and Pierce, they conducted a computer search to find studies. They used the key terms: overjustification, reward(s), intrinsic motivation, and extrinsic motivation.

Tang and Hall do not attempt to make overall general conclusions as Cameron and Pierce did. They tested 10 specific combinations of variables that they believed were important in understanding the overjustification effect. They reported their findings in terms of the 10 situations as well as the age of the subjects. The age of subjects ranged from preschoolers to college students. For each situation tested separate results were presented for
preschoolers, students in grades 1 through 6, 7 through 9, 10 through 12, and college students. Overall results for each situation was also presented.

Variation in Independent Variables

In contrast to the Cameron and Pierce meta-analysis which looked at three variables, Tang and Hall looked at five different aspects of reward to examine the conditions under which rewards influence intrinsic motivation. Reward type and reward expectancy were defined the same as they were in the Cameron and Pierce meta-analysis. Rewards presented to the experimental group were either tangible or verbal, and either expected or unexpected. Like Cameron and Pierce, Tang and Hall also examined reward contingency. In addition to task-contingent and noncontingent rewards, Tang and Hall included two types of performance-contingent rewards. Subjects could be rewarded for performing a task correctly (performance contingent-self comparison) or presented with information following the reward such as, 'you are doing better than anyone else' (performance contingent-social comparison).

Tang and Hall also included studies in which intrinsic motivation, or initial interest in a task, was directly manipulated. In these studies, two levels of interest were compared: high and low. If the experimenter provided
evidence that the task was intrinsically interesting or told the subjects it was then the task was considered to be high interest. If the experimenter provided evidence that the task was less preferred than other tasks or claimed that the task was not interesting then it was considered to be low interest. For example, the experimenter could initially have the subjects rate activities according to what they enjoy the most and least. If they then had them participate in the activity they chose as enjoying the most they would consider the task as high interest. If they had the subjects participate in an activity they stated they did not enjoy, then that activity would be considered as low interest. When interest is initially high the overjustification effect is thought to occur because receiving a reward will shift the subjects’ reasons for doing the task. When interest is initially low the effect is unclear, but not thought to have as much of a negative effect.

The fifth independent variable was additional post-task feedback. In this manipulation feedback was provided to subjects in the experimental group following completion of the task. Feedback was classified into four categories: (a) positive informational (‘you did good’), (b) negative informational (‘you did not do good’), (c) positive
controlling ('you did well, you should try as hard next time'), and (d) negative controlling ('you did not do well, you should try harder next time') (Tang and Hall, 1995). How the feedback is perceived will be an important determiner of what effect it will have on intrinsic motivation.

**Measures of Intrinsic Motivation**

The most frequently used dependent measure of intrinsic motivation in the studies selected by Tang and Hall were time spent on task and self-report measures. Other dependent variables used in the studies were quantity of behavior, quality of behavior, rating by others, or time waited to initiate the task (Tang and Hall, 1995).

**Findings**

Results indicated that when intrinsic interest was initially high, the reward was tangible, expected, and task-contingent with no additional feedback the overjustification effect did exist. This finding was consistent over age of subjects, research design, and dependent measure. When interest was initially low, tangible, expected, task-contingent rewards were found to increase interest, though only in college students.

The overjustification effect was also found when interest was initially high, the reward was tangible,
expected, contingent on performance level, and was not followed by comparative information to the subject. In the same situation, except for interest being initially low, no significant effects were found.

When noncontingent rewards were presented to subjects they showed significantly more interest in the task than the control group. When the reward was presented unexpectedly there was no change in intrinsic interest from before the rewards were presented to after they were removed. When subjects were given positive post-task feedback results showed that intrinsic interest increased. While it was predicted that either controlling or negative post-task feedback would lower intrinsic interest, the results showed that this situation did not affect intrinsic interest.

Overall, the overjustification effect was demonstrated in situations where it was expected to occur (Tang and Hall, 1995).

These findings can be explained with the overjustification effect. In the two situations where Tang and Hall found a decrease in intrinsic motivation initial interest was high. Subjects displayed initial interest in the task when they weren’t being rewarded for it. When they were rewarded, subjects shifted their reasons for doing the task. They now did the task because they were being
rewarded for it, not because they enjoyed it. When the reward was removed the subjects lost their reason for doing the task, therefore they either spent less time on the task or had a less favorable attitude toward the task. The subjects also knew they were going to receive the reward, it was connected to the task, and it was tangible. These situations would also be expected to lead to a decrease in intrinsic motivation.

When interest was initially low, overall no significant effect on intrinsic interest was found, however, an increase in intrinsic motivation was found on the attitude measure for task-contingent, expected, tangible rewards. When a reward is offered for doing a low interest task a shift in reasons for doing the task is not negative because the subjects were not initially intrinsically motivated to work on the task. The reward may have the effect of providing a pleasant reason for doing the task, thereby increasing the attractiveness of the task.

Theorists that support the overjustification effect might explain that verbal rewards had no effect on intrinsic motivation because the subjects did not perceive the rewards as controlling, which would be expected to decrease intrinsic motivation or as informational, which would be expected to increase intrinsic motivation. In the situation
where post-task feedback produced an increase in intrinsic motivation, the rewards would have had to be perceived as informational.

Comparison of Cameron & Pierce and Tang & Hall Findings

When comparing the findings of Cameron and Pierce (1994) and Tang and Hall (1995) there are two similarities. Both found that unexpected rewards does not affect subsequent intrinsic motivation. They also agree on the effects of positive post-task feedback. While Tang and Hall analyzed this variable separately, they found that it increased intrinsic motivation. Cameron and Pierce included post-task feedback with verbal rewards and found that it also increased intrinsic motivation.

Many areas of disagreement were found. One difference is that Cameron & Pierce’s findings indicated that, in general, people who are rewarded are not less intrinsically motivated to work on tasks then the non-rewarded control groups. Tang and Hall did not make such a general statement about their findings. They concentrated on 10 specific situations and what effect each had on intrinsic motivation.

Another point of disagreement was when tangible, expected rewards were given contingent on task performance. Tang and Hall found that this situation led to a decrease in intrinsic motivation, whereas, Cameron and Pierce found that
it did not produce detrimental effects. Tang and Hall found that there was an increase in intrinsic motivation when rewards were provided not contingent on performance. This was the only situation in which Cameron and Pierce found decreases in intrinsic motivation. Tang and Hall did not find a significant effect when verbal rewards were presented, whereas, Cameron and Pierce found that verbal rewards increased intrinsic motivation. (Refer to Figures 1 and 2 for a summary of findings.)

A possible explanation for these different findings could be that Cameron and Pierce used 96 experimental studies in the main meta-analysis, while Tang and Hall only used 50 experimental studies. Also, Cameron and Pierce conducted separate analyses to look at the overall effect of rewards on intrinsic motivation for each of four measures, and four different reward manipulations. Tang and Hall conducted their meta-analysis differently which could account for the differences in results. They tested ten specific situations. These situations were drawn from five instead of three reward manipulations. For example, when Tang and Hall (1995) looked at the effects of tangible, expected, task-contingent and performance-contingent rewards they separated the studies into studies that involved initially high and initially low interest activities.
Cameron and Pierce (1994) did not separate the studies on tangible, expected, task-contingent and performance-contingent rewards. Tang and Hall (1995) also looked at positive feedback separately from verbal rewards. While they did not find an effect of verbal rewards, they did find that positive feedback increased intrinsic motivation. Cameron and Pierce (1994) included positive feedback with verbal rewards.

The two meta-analytic studies attempted to collapse many studies together and then give general, overall conclusions about the effects of different types and presentations of rewards on intrinsic motivation. A review of individual studies will look more closely at specific conditions and factors that might impact intrinsic motivation differently. Rather than an exhaustive review, selective studies that are relevant to issues of intrinsic motivation in a classroom setting will be reviewed. The studies chosen will allow for closer examination of the discrepancies found in the findings of Cameron and Pierce (1994) and Tang and Hall (1995). Three areas will be highlighted: (a) the effects of verbal rewards, (b) the effects of tangible, expected, noncontingent rewards and (c) the effects of tangible, expected, contingent rewards.
Cameron & Pierce Findings

- Verbal Rewards
  - Time on task (+)
  - Attitude (+)

- Task-contingent
  - Expected Tangible Rewards
    - Time on task (NF)
    - Attitude (NF)

- Perf.-contingent
  - Expected Tangible Rewards
    - Time on task (NF)
    - Attitude (+)

- Non-contingent
  - Expected Tangible Rewards
    - Time on task (-)
    - Attitude (NF)

+ = Increase in intrinsic motivation
- = Decrease in intrinsic motivation
NE = No significant effect
Figure 2

Tang & Hall Findings

Verbal rewards

Task-contingent
Expected
Tangible
Rewards

Perf-contingent
Expected
Tangible
Rewards

Non-contingent
Rewards

Time on task
(NF)

High Interest

Low Interest

High Interest

Low Interest

Time on task
(-)

Attitude
(-)

Time on task
(NF)

Attitude
(+)

Time on task
(NF)

Attitude
(+)

Time on task
(NF)

Attitude
(NF)

Time on task
(NF)

Attitude
(NF)

- Increase in intrinsic motivation
- Decrease in intrinsic motivation
NF = No significant effect
Selected studies that examined effects of verbal rewards on intrinsic motivation will be addressed first.

**Verbal Rewards**

When examining the effects of rewards from an educational perspective, verbal rewards, which would include verbal feedback, is an essential teaching component. Praise is considered one of the most common forms of teacher feedback (Eggen & Kauchak, 1997). Attempting to make sense of seemingly contradictory findings on how verbal rewards affect intrinsic motivation would help teachers know when and how to effectively use them in their classroom.

Swann and Pittman (1977) conducted two experiments with elementary students. The second experiment specifically addressed Deci’s hypothesis based on research with college students that verbal rewards increase intrinsic motivation. The second experiment included 65 male and female students from a private elementary school. The sample consisted of 23 first graders, 26 second graders, and 18 third graders. The students were assigned to one of five conditions: (a) child decision: task-contingent reward, (b) child decision: task-contingent reward plus star, (c) child decision: task-contingent reward plus praise, (d) child decision: no reward and (e) decision irrelevant: no reward.
In the child decision condition subjects were allowed to choose which activity they participated in; however they were sat in front of the drawing activity and encouraged by the experimenter to begin with that activity. In the decision irrelevant condition only the drawing activity was made available. In the reward conditions the experimenter showed the subjects a "Good Player" award and told them all they had to do was play a game to win one of the rewards.

After five minutes, in the child decision: task-contingent reward condition, the experimenter presented the "Good Player" award to the subjects for playing the drawing game. The subjects in the child decision: task-contingent rewards plus star condition were treated the same as those in the task-contingent reward condition except they received a blue star on their award. In the task-contingent plus praise condition the experimenter told the subjects that they drew a really good picture and that they are a fine artist. In the no reward condition there was no mention of a reward, and the subjects did not receive a reward. Subjects in the decision irrelevant: no reward condition were seated at the table with only the drawing game and invited to draw. After the five minutes the experimenter placed the other toys on the table. Following the five minutes and the presentation of rewards in the reward
conditions the experimenter introduced a ten minute free choice period in which the subjects could engage in the activities of their choice.

In the free choice period children in the task-contingent reward condition spent an average of 48.3 seconds on the drawing activity, children in the task-contingent reward plus star condition spent 28.2 seconds, and those in the task-contingent reward plus verbal praise condition spent 276.6 seconds on the drawing task. These results indicated that children in the no reward condition chose the drawing task in the free-time period significantly more than those in the task-contingent reward conditions. Subjects in the child decision conditions chose the drawing task significantly less frequently than those in the decision irrelevant condition. Children who received verbal praise chose the drawing game significantly more often than those who received only the "Good Player" award (Swann & Pittman, 1977). This finding replicates Deci's (1971) study on college students that praise can enhance intrinsic motivation and eliminate the negative effects of contingent, tangible rewards.

Zinser, Young, and King (1982) also looked at how verbal rewards influenced intrinsic motivation in children. The purpose of their study was to (a) extend the study of
how verbal rewards influence intrinsic motivation to second and third graders, (b) introduce a manipulation of a high and low level of verbal reward, and (c) extend the work on sex differences. The researchers hypothesized that verbal rewards would increase intrinsic motivation in males and decrease intrinsic motivation in females. They also hypothesized that high verbal reward would be perceived as more controlling than the low verbal reward and thus inhibit intrinsic motivation in female subjects, and possibly all subjects.

The subjects in the study were 48 second graders and 48 third graders. Twenty-four students in each grade were female and 24 in each grade were males. Thirty-two students (16 female and 16 male) were randomly assigned to one of three verbal reward conditions: (a) no reward, (b) low reward, and (c) high reward.

A “Hidden Pictures” task was introduced by the experimenter in the training phase. This task consisted of 8 pictures. Within each picture were 9 to sixteen hidden objects. The objects were drawn below the big picture and the subjects were asked to find the objects in the big picture. The subjects were asked to complete two of the pictures in which they had to find hidden objects within the picture. Following the completion of each of the two
pictures a verbal reward was presented to the high and low verbal reward conditions. Statements such as "That's excellent" and "Hey! That's great" were made to the subjects in the high verbal reward condition. The experimenter made comments such as "That's good" and "Good job" to subjects in the low verbal reward condition.

After the second picture was completed the free-time period began. The experimenter excused herself and unobtrusively observed how much time the subjects spent working on the "Hidden Pictures" task. Alternative activities were also made available to the subjects.

Results indicated that as the magnitude of the verbal reward increased males spent more time on the "Hidden Pictures" task during the free time period and females spent less time on the task. During the free time period, male subjects spent an average of 158.5 seconds on the pictures in the no reward condition, 233.9 seconds in the low rewards condition, and 272.8 seconds in the high reward condition. Female subjects spent 237.6 seconds on the pictures in the no reward condition, 187.4 seconds in the low reward condition, and 152.4 seconds in the high reward condition. High verbal reward appeared to enhance intrinsic motivation in males while decreasing intrinsic motivation in females (Zinser et al., 1982). These results could suggest that
males and females perceive verbal rewards differently. Deci suggested that males might perceive verbal rewards as informational and females as a means of controlling behavior. When rewards are perceived as informational it could increase intrinsic motivation while rewards perceived as controlling could lead to decrements in intrinsic motivation.

Boggiano, Main, & Katz (1991) conducted a study that examined the effects of adult feedback on fourth through sixth grade students. Like Zinser et al. (1982) rewards in the form of verbal praise were found to enhance intrinsic motivation of boys, but had an inhibiting effect in girls. Before conducting their first experiment the researchers hypothesized that females would be more likely than males to develop an extrinsic orientation. The first experiment involved 213 fourth through sixth grade students. Of these students 107 were girls and 106 were boys. The experimenters had the subjects complete the Scale of Intrinsic versus Extrinsic Motivation. This instrument has 30 items and is used to assess motivational orientation (Harter, 1981 as cited in Boggiano et al., 1991). Using four of the five subscales, females were found to be significantly more extrinsic than males.
Boggiano et al. (1991) conducted a second experiment in which they examined the differences in female and male preference for challenge as a function of their motivational orientation and evaluative controlling feedback. They hypothesized that females would be more vulnerable to the effects of controlling feedback from adults than their male counterparts.

Participants in the study were 64 9- to 11 year old males and females with either an extrinsic or intrinsic motivational orientation. Subjects were assigned to one of two feedback conditions: 1) high controlling feedback or 2) low controlling feedback.

The subjects were asked to complete two trials of a moderately difficult shape matching game. Following a practice trial subjects in the high controlling feedback condition were told "I’ll bet you’ll want to do this well next time- as you should- as you ought to." Prior to the second trial they were told "You’re doing fine- as you should be doing." Subjects in the low controlling feedback condition were told "I’ll bet you’ll want to do well following the practice trial, and "You’re doing fine" prior to the second trial (Boggiano et al., 1991 p. 516). After completion of both trials the subjects participated in an eight minute free play period. Along with the moderate
version of the shape-matching game, an easier and more
difficult version was made available for the subjects to
choose. Other activities were also made available.

The results revealed a significant main effect of
motivational orientation. Subjects with a intrinsic
motivational orientation showed a higher level for
preference of challenge relative to extrinsics. Males that
either had an extrinsic or intrinsic motivational
orientation did not differ in their preference for challenge
as a function of low vs. high controlling feedback.
Relative to females with an intrinsic motivational
orientation, female extrinsics displayed significantly lower
preference for challenge. This occurred under the high
controlling feedback condition. No differences were found
under the low controlling feedback condition. These results
indicate that girls in grade school are more likely to be
extrinsically motivated and that such girls are in turn more
likely to be negatively affected by teacher feedback that is
interpreted as controlling (Boggiano et. al, 1991).

A study was conducted by Koestner, Zuckerman, and
Koestner (1987) that examined the relationship between
content of praise, type of involvement, and intrinsic
motivation. The subjects were 56 introductory psychology
students. Twenty-four of the subjects were male and 32 were
female. Each subject was introduced to hidden-figure tasks in either an ego-involving or task-involving manner.

In the ego-involving condition the experimenter referred to the task as a test and stated that their ability to solve the task was related to creative intelligence. In the task-involving condition the experimenter simply described the puzzles and referred to them as only puzzles, not a test. There was no mention of a link to creative intelligence. During the manipulation phase subjects in both conditions either received ability-focused praise, effort-focused praise, or no praise for their performance. A six-minute free choice period followed.

Results showed that subjects in the ego-involving condition spent an average of 147 seconds working on the puzzles in the free choice period while those in the task-involving condition spent an average of 215 seconds. The subjects that received ability-focused praise spent an average of 283 seconds, those who received effort-focused praise spent an average of 229 seconds, and those who did not receive any praise spent an average of 120 seconds working on the puzzles. Ability-focused praise increased subsequent intrinsic motivation relative to effort-focused praise and no praise. The task-involving state increased intrinsic motivation relative to the ego-involving
condition. Subsequent results indicated that those with higher levels of intrinsic motivation performed better at related, but more complex tasks, and chose more challenging tasks.

In summary, research has shown that verbal rewards, such as praise and feedback has the ability to enhance motivation. It has been shown to increase time on a targeted activity significantly more than a tangible reward (Swann and Pittman, 1977). There is also evidence that sex differences exist. Praise has shown to enhance intrinsic motivation in males, but not females (Zinser, et al., 1982). Boggiano, et al. (1991) found that girls that are considered extrinsics are more negatively affected by high-controlling feedback by displaying a lower preference for challenge. Males that were either extrinsics or intrinsics did not differ in their preference for challenge whether they received low or high controlling feedback. Finally, ability-focused praise was found to increase subsequent intrinsic motivation relative to effort-focused praise and no praise (Koestner, et al., 1987).

The relationship between verbal rewards and intrinsic motivation is complex. While verbal rewards have been shown to have the capability to enhance intrinsic motivation, one can not make the assumption that verbal rewards in the form
of praise or feedback always functions in this manner. Instead research has shown how verbal rewards are presented, and the context in which it is received both affect subsequent intrinsic motivation (Koestner et al., 1987).

**Noncontingent, Tangible, Expected Rewards**

In the Cameron and Pierce (1994) study it was concluded that noncontingent, tangible, expected rewards decreased subsequent intrinsic motivation. Conversely, Tang and Hall (1995) found that this situation increased intrinsic motivation. Of all the studies that have examined the effects of reward contingencies on intrinsic motivation, few studies have looked at the effects of noncontingent rewards.

One study was conducted by Deci (1972). Subjects in this study were college students. He had them engage in a puzzle solving task. The subjects were either in the noncontingent reward condition, or the no reward control condition. He offered the subjects in the noncontingent reward condition $2 for just participating in the experiment. In the free choice period the time the subjects spent on the puzzle solving task was recorded. The results indicated that the time spent on the task did not significantly differ between those that received the noncontingent reward and those that did not receive a reward. It was concluded that the intrinsic motivation of
the subjects who received $2 for participation did not differ from those who were not rewarded (Deci, 1972). These results were replicated by Pinder (1976). He also employed college students in his study.

Swann and Pittman (1977) also found similar results using elementary school children as subjects. In Experiment 1 subjects included 63 first, second, and third graders. They were assigned to one of three reward conditions. Those in the task-contingent reward condition were told they would win a "Good Player" award if they played one of the games. Subjects in the noncontingent reward condition were told all they would have to do to win the award was to stay in the room for 5 minutes. In the no reward condition there was no mention of a reward. All groups were encouraged to participate in a drawing activity. Following the 5 minute period, a 10 minute free choice period occurred.

During the free choice period children in the noncontingent reward condition engaged in the drawing activity for 264.8 seconds. Those in the task-contingent reward condition engaged in drawing for 106 seconds. Those in the no reward condition drew for 301.4 seconds. The difference between the time spent on drawing between the noncontingent reward group and no reward group was found to be non significant.
From these studies it would appear that noncontingent rewards do not have either a positive or negative effect on intrinsic motivation. It would seem that because noncontingent rewards are not in any way tied to the task being asked of the subjects it would not affect intrinsic motivation. Because the reward is not dependent on the task, the reward would not provide extra reasons for a person to participate in the activity as the overjustification effect would imply. Therefore, intrinsic motivation should not decrease.

This conclusion would not be in agreement with either of the findings of Cameron and Pierce (1994) or Tang and Hall (1995). The inconsistent conclusions could be due to the inconsistent way contingency terms have been defined. Some researchers have been erroneous in the way they define noncontingency (Ryan, Mims, and Koestner, 1983). In particular, two studies, (Calder and Staw, 1975 & Weiner and Mander, 1978) stated that they looked at the effects of noncontingent rewards. However, when examining how they presented the rewards they should have been considered task-contingent rewards. In the Calder and Staw (1975) study the experimenter told the subjects they would receive their reward when they finished. In the Weiner and Mander (1978) study the reward was given for "continued involvement in the
task". Considering this inconsistency it could be possible that the two meta-analytic studies used studies they thought were examining noncontingent rewards, but were really task-contingent rewards.

**Contingent, Tangible, Expected Rewards**

Research has shown that rewarding students for simply completing a task rather than for making specified progress can undermine intrinsic motivation (Chance, 1992). From an educational perspective task-contingent rewards could be detrimental to students. For example, giving a student an "A" on a paper merely for completing it tells the student that any level of performance is acceptable and minimal effort is needed. Quality of work will in turn suffer (Eggen and Kauchak, 1997). Research has also shown that extrinsic rewards can support intrinsic motivation if used in certain ways (Brophy, 1998). Rewards can enhance motivation if they are given for achieving a specified performance standard (Cameron and Pierce, 1994, 1996; Chance, 1993).

Karniol and Ross (1977) conducted a laboratory study in which they tested the effects of performance-contingent and performance-irrelevant rewards on intrinsic interest in an activity. The researchers hypothesized that subjects who received performance-irrelevant rewards would display less
intrinsic interest in the activity than those who received either performance relevant rewards or no rewards.

The subjects who participated in the study were 57 children aged four through nine. Each subject individually participated in a slide game. Each slide contained two pictures and the children were asked to indicate which picture they thought would make the green light go on. If they thought the picture on the right would make the light go on then they were to push the right response button, and if they thought the picture on the left would then they were to push the left response button.

The subjects were told that they would see twenty slides. Subjects in the low performance condition were told that the average child of their age chose sixteen correct responses and less than sixteen correct responses was less than average. Subjects in the high performance condition were told that if they got more than six correct they were above average, and less than six correct would be below average. The game was programmed so that all of the subjects had ten correct responses.

Subjects were further divided into four reward conditions. In the high performance-relevant reward condition subjects were told if they made six or fewer correct responses they would receive one marshmallow. If
they made more than six correct responses they would receive two marshmallows. In the low performance-relevant reward condition subjects were told they would receive three marshmallows if they got sixteen or more correct responses. They would receive two marshmallows if they made fewer than sixteen correct responses. In the performance-irrelevant reward condition subjects were told they would receive two marshmallows for playing the game. Subjects in the no reward condition were not promised or given a reward. Following the twenty trials, the free play session was implemented. The subjects were given six minutes to play with the slide game or other toys in the room.

Results indicated that subjects in the performance-irrelevant reward condition spent significantly less time playing with the slide game in the free play session relative to the subjects in the performance-relevant reward and control conditions. Whereas subjects in the high performance and performance-irrelevant reward condition spent an average of 126.35 seconds on the slide game in the free play session, subjects in the high performance, control condition spent 260.49 seconds, and the subjects in the high performance and performance-relevant reward condition spent 247.00 seconds on the slide game (Karniol & Ross, 1977).
While Karniol and Ross (1977) demonstrated that performance-contingent rewards are less detrimental to intrinsic motivation than task-contingent rewards, Boggiano, Harackiewicz, Bessette, and Main (1985) examined the assumption that performance-contingent reward may enhance motivation to perform school-related activities. They hypothesized that performance-contingent rewards would enhance intrinsic motivation because this type of contingency would provide information about task competence.

Participants in the study were 33 male and 32 female kindergarten students attending school in either Boulder, Colorado, or suburban New York areas. They were randomly assigned to one of four experimental conditions or a control condition.

After being introduced to three different puzzle games the manipulations were implemented. Subjects in the task-contingent reward condition were told they would receive five stickers if they simply worked on the maze puzzles, while subjects in the performance-contingent reward conditions were told that they would be given up to five stickers for successfully completing the maze puzzles. In the “more salient” conditions a bowl was placed in view of the subjects and a sticker was dropped into the bowl upon either completion of a puzzle if they were in the task-
contingent reward condition, or successful completion of a puzzle if they were in the performance-contingent reward condition. Subjects in the "less salient" reward conditions could not see the stickers being placed in the bowl as they were completing the puzzles. Participants in the control condition also completed the puzzles, but they were not rewarded.

When finished with the five trials those in the reward conditions were given their stickers. The experimenter then told the subjects she had to leave for a few minutes and they could either play with more maze puzzles or any of the other puzzles at the table. The subjects then engaged in a five minute free play session.

The average time subjects spent playing with the maze puzzles were calculated for each of the five conditions. Subjects in the control condition spent an average of 146.44 seconds on the maze puzzles. Those in the task-contingent/less salient condition spent an average of 88.51 seconds while those in the task-contingent/more salient condition spent an average of 75.85 seconds on the maze puzzles. In the performance-contingent/less salient condition subjects spent an average of 114.15 seconds and subjects in the performance-contingent/more salient
condition spent an average of 162.38 seconds on the maze puzzles.

These results indicated that the performance-contingent/more salient reward condition significantly increased intrinsic interest relative to both the task-contingent/more salient and task-contingent/less salient reward conditions but not relative to the control or performance-contingent/less salient conditions. Another significant effect found was that task-contingent rewards undermined intrinsic interest relative to the control group. These results suggest that the salience of reward contingency, or if the rewards are presented in a way that draw attention to them, is an important determiner of how rewards affect intrinsic motivation. When motivated by task-contingent rewards, the controlling function varies with salience of the contingency and determines future intrinsic motivation. Conversely, when performance-related contingencies are made salient, later interest is increased (Boggiano, et al., 1985).

Another study that examined the effects of performance-contingent rewards on intrinsic motivation was conducted by Harackiewicz and Manderlink (1984), however participants in the study included high school students. Another difference in this study was that a questionnaire was used as the
measure of intrinsic motivation. Results from this study showed that performance-contingent rewards significantly enhanced intrinsic interest relative to no-reward controls receiving identical feedback.

Similar to the researchers mentioned above, Luyten and Lens (1981) also examined the effects of different types of reward contingencies. They stated that performance-contingent rewards are not arbitrarily attached to the task, but it is a natural consequence of reaching a goal. Persons receiving a performance-contingent rewards would attribute the reward to obtaining a certain level of skill and competence therefore there would be no overjustification. As a result of feelings of competence the researchers predicted that performance-contingent rewards would lead to an increase in intrinsic motivation relative to task-contingent rewards.

Participants in the study involved 20 male and 20 female undergraduates students at a university. They were individually tested. The experimenter presented them with 16 wooden blocks and they were asked to construct models that were presented to them in a booklet.

The subjects were randomly assigned to one of four experimental conditions. In the task-contingent reward condition subjects received money for solving the first
three models. They were told that there wasn’t money left
to give for solving the fourth model. Subjects in the
performance-contingent reward condition were told that they
would receive money for each model solved faster than 50% of
the subjects in their group. In the no reward/task­
contingent reward condition subjects first completed three
models without a reward. They were then offered money for
each of three additional models completed. Subjects in the
no reward condition completed four models without receiving
a reward.

Following the manipulations the experimenter left the
room and observed for a five minute period to determine how
much time the subjects spent solving additional models.
There were also magazines in the room for the subjects to
look at. Following the free-choice session the subjects
were asked to complete a questionnaire asking about their
interest in the activity and their willingness to
participate in similar activities.

Results indicated that subjects in the task-contingent
reward condition spent less time working on the models in
the free-choice period then those in the no reward
condition. They also reported less interest in the task and
less willingness to participate in future projects then both
the no reward and performance-contingent reward conditions.
Subjects in the performance-contingent condition had significantly higher ratings for willingness to volunteer in future projects and time they would commit to future projects than the task-contingent reward condition.

In summary, rewards are thought to have a controlling quality to them, therefore are capable of undermining intrinsic motivation. Task-contingent rewards convey the message of control without providing informational value thus they tend to undermine intrinsic motivation (Ryan, Mims, and Koestner, 1983). When focusing on task-contingent rewards evidence seems to support the notion that they, alone, tend to decrease subsequent intrinsic motivation relative to no reward control groups (Boggiano, et al., 1985; Luyten and Lens, 1981; Eisenberger and Cameron, 1996).

Performance-contingent rewards are given for achieving a specified criteria therefore they provide information about the individual’s achievement. Because they emphasize an informational, rather than a controlling aspect, performance contingent rewards are less likely to undermine intrinsic motivation than task-contingent rewards (Stipek, 1998). Performance-contingent rewards have even been shown to enhance intrinsic motivation (Harackiewicz and Manderlink, 1985).
Conclusion

Research on extrinsic rewards and intrinsic motivation is vast and at times seems complex. It has been a topic of interest for several decades, and the earliest research in the 1970's illustrated that extrinsic rewards could be detrimental to one's intrinsic motivation. An exception was when Deci (1971) found that verbal rewards had the capability to increase subsequent motivation in a task. Since then, numerous studies have been conducted examining different conditions in which rewards affect intrinsic motivation. With this abundance of research came differing of opinions and controversy. Research was presented on both sides of the debate. Some researchers were able to conclude that rewards undermine intrinsic motivation under certain circumstances, yet might have no effect or even enhance it under other conditions (Deci, 1975; Cameron and Pierce, 1994; Tang and Hall, 1995).

In an attempt to make sense of all the research in this area, two meta-analytic studies were conducted. In Cameron and Pierce's (1994) study the overall conclusion was made that reward does not undermine intrinsic motivation. The only negative effect found was when expected, tangible, task-contingent rewards were given. Even then, they stated the negative effect to be minimal.
Tang and Hall (1995) concluded that intrinsic motivation is undermined when initial interest is high and rewards are expected, tangible, task-contingent, and additional feedback is unavailable. They also found a negative effect on intrinsic motivation when performance-contingent rewards are given without comparative information provided to the subjects.

There were critics that spoke out toward the two meta-analytic studies. Lepper, Keavney, and Drake (1996) stated that to examine the "overall" effects of rewards was meaningless and misguided considering the vast amount of research that has provided varied effects depending on numerous circumstances. The more appropriate question would have been under what conditions do rewards affect intrinsic motivation differently. Another problem found with both meta-analytic studies were that studies were being combined that might have appeared to be examining the same thing, but with a closer look, they were really not that similar. When looking at studies across the literature there are many different variables and procedures that are involved in one study. While it might seem like a researcher is trying to make a distinction between the effects of tangible rewards to verbal rewards, often you must also consider issues of contingency, expectedness, and additional feedback.
Therefore it seems useless to try and combine studies that have many confounding variables which could ultimately affect the outcome of the study (Lepper, 1995; Lepper, et al., 1996; Ryan and Deci, 1996).

A review of individual studies looked at the inconsistencies found in the two meta-analytic studies. This review found that under different conditions rewards do indeed have different effects on intrinsic motivation. For example, verbal rewards had the capability of enhancing intrinsic motivation, yet the chance seemed to be greater for males than females. Praise that is delivered in a way such that it provides informative feedback rather than as exerting control over behavior will lead to increased intrinsic motivation (Brophy, 1998).

Reward contingencies also have differing effects on intrinsic motivation. Noncontingent rewards were not found to significantly affect intrinsic motivation either positively or negatively. A decrease in intrinsic motivation was most likely to occur when a reward was given for participation in an activity, but not reaching a specified performance level (task-contingent reward.) Performance-contingent rewards were less likely to undermine intrinsic motivation, and has been shown to enhance it.
What is important to remember is that the research in this area is not black and white. There are many variables that play a role in determining what effect rewards will have on intrinsic motivation. The effects will greatly vary depending on how they are presented and also how they are perceived by the individual (Stipek, 1998).

**Practical Applications**

One goal of educators is to promote intrinsic motivation in their students so they will want to invest free time in learning (Pintrich and Schunk, 1996). Also, according to Brophy (1998) most teachers want to reward students' efforts and hard work. They see it as a way to encourage their learning and as an aid in building rapport. In order to achieve this teachers must be aware of how and when to reward students so it will be mutually beneficial and particularly maximize their students' intrinsic motivation.

Research suggests that there are several advantages of being intrinsically motivated. Individuals that are intrinsically motivated are more likely to select challenging tasks. They are more likely to learn relatively more on a conceptual level when they rate the material as being intrinsically interesting. Greater creativity has been shown under conditions that also promote intrinsic
motivation. Those that are intrinsically motivated also show more enjoyment and involvement in activities than those motivated extrinsically (Stipek, 1998).

Suggestions for Future Research

Much of the research that has been conducted in this area has been somewhere other than in a classroom setting. Reasons cited for not conducting research in the classroom tend to be ethical in nature. If the manipulation would lead to a decrease in intrinsic motivation it has the potential of causing a permanent negative effect on the participants. Tang and Hall (1995) suggest that studies should be conducted in real classroom settings. If the manipulation should lead to a decrease in intrinsic motivation than the researcher should go through a debriefing process with the subjects. The debriefing should rectify the reduction in intrinsic motivation.
References


