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The Overjustification Effect: An Affective Interpretation

Helena Grace Pretty

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THE OVERJUSTIFICATION EFFECT:
AN AFFECTIVE INTERPRETATION

by
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Submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

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ABSTRACT

The purpose of the present research is to investigate the overjustification phenomenon whereby a person who performs an intrinsically interesting activity for an expected, external reward sometimes decreases his or her subsequent interest and engagement in that activity. The determinants of this effect have important implications for the type of contingency payment and reward systems used in organizational psychology and education where sustaining intrinsic motivation is a central concern.

Currently two main explanations of the overjustification process have been given: the self-perception overjustification hypothesis, and cognitive evaluation theory. Research that has been done to assess the validity of these explanations is reviewed and it is concluded that they are inadequate. Consistent with recent research in affect, a novel approach to the overjustification paradigm is taken in the present research. Specifically it was proposed that negative affect has a critical detrimental influence on intrinsic motivation, either as a reaction derived from self-perception and evaluation processes or as a factor that acts independently of these cognitive activities.

Two studies, using the typical overjustification paradigm, were undertaken to test these hypotheses. In study 1, the overjustification effect was successfully replicated for both behavioral and self-report measures of intrinsic motivation. Importantly, negative affect, measured by the Multiple Affect Adjective Checklist, paralleled these results, and was greatest in those conditions in which intrinsic motivation was predicted and found to be low (i.e., expected reward).

In study 2, affect was directly manipulated, independently of the cognitive manipulations, using Velton's mood induction technique. The results showed that the induced positive affect erased the decrease in intrinsic motivation seen in study 1.

The findings are interpreted as support for an affective interpretation of the overjustification phenomenon. More generally, it is suggested that what determines the maintenance of intrinsic interest in any activity is the amount of negative affect that becomes associated with the activity from whatever source. Possible explanations as to how this affective process may influence future behavior are discussed, as are the implications for future research in intrinsic motivation, cognitive behavior theories and organizational psychology.

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CHAPTER I

INTRODUCTION

The purpose of this dissertation is to explore and explicate the psychological determinants of the overjustification effect. The overjustification effect describes the phenomenon whereby a person who performs an intrinsically interesting activity for external reward sometimes decreases his subsequent interest and engagement in that activity.

Understanding the nature of this phenomenon is important in several domains where sustaining motivation is a central concern. Two examples will be mentioned here. Educational psychologists are interested in the effects that various reward systems have on children's subsequent intrinsic interest in the materials they are learning. It has been speculated that rewarding schoolchildren for participating in activities they enjoy may reduce their future interest in them after the rewards have been withdrawn. Do the stars, grades and awards of the education system diminish children's intrinsic interest to learn? A similar question has been asked by organizational psychologists. Is it the case, as it has been assumed, that the effects of external rewards (pay, benefits) and intrinsic rewards (challenge, interest) are summed together, would a worker be more motivated to complete a task that combined both kinds of rewards, than a task that had only one kind of reward (Porter & Lawler, 1968; Lawler, 1973)? Because of the implications for job enrichment and contingency payment systems, numerous studies have tried to determine the critical components of the overjustification phenomenon. (See Hamner & Foster, 1975; Boal & Cummings, 1981.)

Currently two main explanations of the overjustification process guide research in this area. These are the self-perception overjustification hypothesis (Lepper, Greene & Nisbett, 1973) and the cognitive evaluation theory (Deci, 1975; Deci & Ryan, 1980). This introduction will demonstrate that after a decade of research based on these theories, neither one has been able consistently to predict and explain the results of numerous investigations. The thesis to be developed here is that the overjustification hypothesis and cognitive evaluation theory, which are both based on information processing models, only partially illuminate the determinants of the overjustification effect. It will be proposed that the affect implicit in these cognitive explanations and also the affect not necessarily associated with these cognitions determine, in part, the overjustification phenomenon.

Explanations of the Overjustification Effect

The Self-Perception Overjustification Hypothesis

The effect of external reward on intrinsic motivation was originally called the overjustification effect by Lepper, Greene and Nisbett in 1973. The basic premise of the hypothesis is that an external reward overjustifies the person's intrinsic reason for participating in the interesting activity. The process by which this overjustification analysis occurs is based on a self-perception model of intrinsic motivation. To describe this model, it is first necessary to clarify the concept of intrinsic motivation.

By definition, behavior is categorized as intrinsically motivated when it is an "end" in itself and is not performed in order to obtain

some external reward. This is contrasted with extrinsic motivation which produces behavior performed as a means to obtaining a particular "end" which is not a part of the behavior itself. The differentiation between the two types of motivation, then, has been made primarily on the basis of whether or not the stimulus for the behavior is extrinsic or intrinsic to the behavior itself. Extrinsic motivators include such categories as rewards, bonuses, incentives and bribes, all of which are often under the control of other persons or environmental contingencies. Hence, extrinsic motivation is often considered to be other-controlled or other-directed. Intrinsic motivators have been identified as internal needs for challenge, complexity and self determination, which are self-controlled and self-satisfied (Staw, 1976).

Most investigators currently conceptualize intrinsic and extrinsic motivation as stemming from perceptions made by individuals concerning the causes of their behavior--that is, whether it is stimulated by intrinsic or extrinsic motivators. This is derived from deCharms' (1968) use of Heider's locus of causality theory to describe the difference between perceiving that persons are the cause of their own behavior (intrinsic) and perceiving the cause of their behavior to be external to them (extrinsic). Bem's self-perception theory (1972) extends deCharms' ideas, maintaining that people infer their internal states and the causes of their behavior by observing their behavior and the context in which it occurs.

The overjustification hypothesis of Lepper et al. (1973) adopts this perceptual conceptualization of intrinsic motivation. They maintain that a behavior is perceived to be intrinsically motivated when

there are no salient, unambiguous or psychologically sufficient external rewards to justify it. In such an instance, people consider their behavior to be an end in itself rather than a means to an end. Based on this self-perception model, they hypothesize that when offered a reward people re-evaluate the reasons for their motivation and no longer perceive intrinsic interest to be sufficient. Instead, they perceive the external reward to be the prime motivator. They therefore "discount" intrinsic reasons for extrinsic ones (Kelley, 1973). When they are given the opportunity to engage in the activity at a later time, they tend not to be motivated unless extrinsic rewards are available. As Pittman, Emery and Boggiano (1982) suggest, the person adopts an extrinsic orientation toward the activity.

The overjustification hypothesis, however, does not explain why the perception of extrinsic or intrinsic motivation should affect one's behavior or attitude toward an activity. The theory makes assumptions for which there are no logical reasons. The question remains, what are the characteristics of perceived extrinsic motivation which have a negative effect on the performance of or attitude toward an activity; and, how do these differ from those of perceived intrinsic motivation which have a positive effect on task performance persistence and attitude.

Cognitive Evaluation Theory

Cognitive evaluation theory (Deci, 1975) has been proposed as an explanation of the variables that mediate the perception of one's motivation and one's actual behavior. It can be viewed as supplementary to the overjustification hypothesis of Lepper et al., as it also is based on a self-perception model of intrinsic motivation. However, it emphasizes other aspects of the information being processed.

This theory gives a detailed analysis of both the concept of intrinsic motivation and the process by which it is perceived and influences subsequent behavior. Deci's model reflects positions taken earlier by White (1959) and deCharms (1968) that people need to feel that they are in control of their own behavior in dealing with the surroundings. White had suggested this "effectance motivation" was the primary intrinsic motive, the other motives, such as challenge, being a subclass. Deci maintains that there are two classes of intrinsically motivated behavior; that which is oriented toward seeking challenge and that which is oriented toward conquering the challenge once it is discovered. It is only when people are able to conquer the challenges they encounter or create that they perceive themselves to be competent and self-determined individuals.

Deci presents a detailed cognitive model to explain the process of intrinsic motivation. This process begins with an awareness of information which is already within the person's cognitive structures and is currently being processed from the environment. This information is processed by the central nervous system, and results in a motive. (A motive is defined as awareness of some potential satisfaction.) The person selects specific behavioral goals to accommodate the motive and decides on courses of action necessary to meet these prescribed goals. These are performed until the individual decides that the motive has been satisfied. This cognitive evaluation process uses information from outside sources (i.e., feedback from others) which is compared with one's own internal expectations and standards. Within this evaluation and self-perception process, behavior is attributed to intrinsic motivation when such evaluations result in self-attributions of competence and self-determination.

Deci maintains, then, that intrinsic motivation is determined by needs for a sense of competence and self-determination. On the basis of this premise he proposes that rewards can have a detrimental effect on intrinsic motivation when either the perceived self-determination or self-competence is lowered. Observation and evaluation of the causes of one's behavior using external sources of feedback and internal sources of standards and expectations may lead one to think that one is performing the task only for the reward. This, according to Deci, lowers self-determination and consequently intrinsic motivation is decreased. A sense of self-competence is affected when rewards are given contingent on a performance criterion or when performance is evaluated by another person.

According to the theory, the inability to predict the effect of rewards on intrinsic motivation can be explained by assuming that different properties are salient in different situations. Both tangible and intangible rewards have two "properties" or "natures", an informational property and a controlling property. The informational property provides information about one's competence. The control property influences the perception of the locus of causality of the behavior and hence the individual's self-determination. Therefore, one cannot predict the effect a particular reward will have on intrinsic motivation unless one can determine which property is operating and is most salient to the subject. When control properties, indicating an external locus of control, or informational properties, indicating a lack of competence, are salient, Deci predicts motivation will decrease because of the decrease in competence and perceived self-determination. However, when informational properties are positive, indicating competence, and control properties are not as salient, intrinsic

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motivation will not decrease. Deci's theory therefore explains the parameters of the overjustification phenomenon in terms of the salience of the control versus the informational aspects of reward.

Empirical Support for the Overjustification Explanations

Both the overjustification hypothesis and the cognitive evaluation theory have generated a considerable number of studies. In the following section, the results of this research will be summarized. Due to the large number of investigations, only a few will actually be described. The remaining studies that are referenced below have been briefly summarized and are presented in Appendix A.

The Overjustification Hypothesis

Lepper, Greene and Nisbett (1973) hypothesized that if extrinsic rewards are given to a person to perform an intrinsically interesting activity, the individual's subsequent interest and engagement in the activity will decrease to the extent that the external contingencies are salient and psychologically sufficient to cause an external attribution to the source of his or her motivation.

The first study of Lepper et al. (1973) tested the hypothesis in a three session paradigm with nursery school children. In phase 1 investigators unobtrusively measured the children's initial intrinsic interest in an activity (drawing with novel crayons) by observing them during a free play session. During phase 2 they were again observed and given the opportunity to draw under one of three conditions. In one condition, subjects were shown and promised a "good player award" prior to committing themselves to draw and were given the reward at the end of

the session. A second group of subjects was given the same reward unexpectedly at the end of the session, while a third group of subjects was neither promised nor given the reward unexpectedly. In phase 3, investigators again observed the amount of time subjects spent drawing when no reward was promised and there were other attractive activities in which to engage. As predicted by the overjustification hypothesis, children in the promised reward condition spent less time drawing during this post test than children in either the unexpected reward or no reward conditions. These findings were replicated in many studies which followed (cf. Lepper & Greene, 1978). Further data supportive of this hypothesis came from a study by Ross (1975), in which the perceptual salience of reward was manipulated. Results showed that the more salient the reward was, the more intrinsic motivation decreased. Despite many replications of the original findings and success in dispelling various alternative explanations (e.g., the competing response hypothesis of Reiss and Sushinsky, 1975, and the delay of gratification hypothesis of Ross, Karniol and Rothstein, 1976), the adequacy of the overjustification hypothesis has been questioned by several investigators. (See Smith, 1975; Condry, 1977; Ranssen, 1980; Morgan, 1981.) The main criticism concerns the validity of the assumption that the behavioral indicant of intrinsic motivation is controlled by or reflects the hypothesized cognitive processes. Specifically, researchers question whether or not the discounting principle, which is central to the overjustification hypothesis, is actually used.

The discounting principle states that the role assigned to a particular cause in producing a specific effect will be discounted if

other plausible causes are recognized (Kelley, 1973). In the case of this theory, internal causes are discounted for external causes when rewards are expected.

The scepticism regarding the use of this principle originates from several sources: research which demonstrates the inability of young children, who are frequently used in this research, to use the discounting principle; lack of evidence in the research with adult subjects that they actually recognize or consider internal versus external causes of their behavior; research findings where perceived changes in causality did not produce the hypothesized results; and the lack of consistent co-variation of behavioral and self-report measures of intrinsic motivation. These findings will be reviewed next.

Use of discounting principle. Evidence for the inability of young children, the typical subjects in research by Lepper and his associates, to use the discounting principle comes from research by Smith (1975), Karniol and Ross (1975a), Ranssen (1980) and Morgan (1981).

Smith (1975) presented kindergarten children with pairs of stories about other children. One child was either rewarded for playing with a toy or ordered to play with the toy, while another was clearly playing with the same toy of his own volition. The experimenter then asked which child wanted to play with the toy. Smith found that the children responded randomly to the question. He questioned whether these children were actually able to use the discounting principle in the light of their answers. He found that discounting did occur with greater frequency as the age of the children increased (up to the 4th grade). As Smith had not checked for comprehension, Karniol and Ross (1975a) speculated that these results might have resulted because the

younger children did not understand the stories as well as the older children. They replicated Smith's experiment assuring story comprehension. Their results were consistent with Smith's. The discounting rule was used by older children, but most kindergarten children did not systematically engage in discounting. In fact, younger children tended to perceive the extrinsic cause as augmenting the intrinsic one. Two stages that corresponded to age, an additive and a discounting one, seemed to be distinguishable. Similarly, neither Ransén (1980) nor Morgan (1981) could find any evidence to support the use of the discounting principle in the overjustification paradigm.

Lepper, Sagotsky, Dafoe and Greene (1982) responded to the above research findings by arguing that the acquisition of an abstract principle like discounting occurs gradually. Children experience and observe the way adults use external incentives to coerce people to do undesired activities and to reward them for their performance. They become able to distinguish between the two uses of reward by employing abstract distinctions and generalizations as "new experiences are assimilated to familiar social settings and schemas". As a result, Lepper et al., argue that "young children need not possess an abstract and reflective understanding of the discounting principle to show discounting effects in particular concrete and familiar situations" (p. 53). In such situations they simply employ social scripts which they have learned. Secondly, the investigators maintain that the relative sophistication of children's responses to a particular situation involving extrinsic incentives or other social constraints "should depend on the extent to which their prior experiences with similar social control techniques have been associated with attempts to coerce .

them or others into engaging in activities of minimal inherent interest" (p. 54). In a series of three experiments children's responses as observers and as participants to the imposition of extrinsic manipulations were investigated, varying the familiarity of the context in which they occurred. In one study in this series, subjects were presented with the choice of engaging in one desirable activity as a means of earning the chance to engage in a second activity of equal intrinsic interest. The children demonstrated a tendency to discount interest in the first activity when it was a "means" compared to when it was an "end". Results indicated a progression from initially concrete social schemas to more abstract generalizations as the situations presented were more familiar. However, the children were not always able to verbalize evidence of any reflective awareness of the abstract principle involved either when assessing the preferences and reasons for preferences as observers, or when evaluating their own behavior. In all three studies an overjustification effect occurred.

Lepper et al. explain the discrepancy between their findings and those of Karniol and Ross (1975a) and Smith (1975) in terms of the complexity and familiarity differences which exist in the two types of experimental situations employed. They suggest that the rewards used in previous research are encountered by children in more difficult contexts which requires the differentiation of several abstract principles or schemas. Thus, the selection of a particular principle as the explanation, is a more complex task. In contrast, Lepper et al. maintain that the manipulation used by them in their research requires the processing of fewer complex abstractions. The children are more familiar with their contingencies that have fewer possible interpretations than the contingencies used by previous investigators.

The final conclusion made by Lepper et al., is that "the effects, observed in overjustification research are the result of the imposition of superfluous extrinsic constraints on children's actions, not a specific function of the use of tangible rewards per se." (p. 62).

Inference of cognitive processes. The recent research still does not resolve the present concern that the cognitive processes underlying the overjustification hypothesis can only be inferred. (An issue which Lepper et al. (1982) admit they do not address.) Few researchers have actually asked subjects why they continued or did not continue to work on the task (see Appendix A). Those that did, (e.g., Kruglanski, Alon & Lewis, 1972; Pinder, 1976; Farr, 1976; Boal & Cummings, 1981) seldom found any indication of the attribution processes assumed to be operating.

Contributing further to this lack of evidence of inferred cognitive processes are studies in which the subjects report changes in internal/external perceptions, but fail to evidence either a behavioral or attitudinal decrease in intrinsic motivation. Fisher (1978), for example, reported that the pay contingency did cause differences in subjects' perception of locus of control, but that there was no resulting decrease in the amount of free time spent on the task or self report measures of task interest or job satisfaction. Similarly, Philips and Lord (1980) found that the pay manipulation significantly affected attributions of causality due to rewards. However, neither behavioral nor attributional measures of intrinsic motivation were significantly affected by the manipulation.

A lack of correlation between measures of intrinsic motivation. A final source of reservations regarding the actual occurrence of the assumed self perception processes is the recurring lack of co-variation

among behavioral and self-report measures of intrinsic motivation and the general lack of significant self-report results. Of the 45 overjustification studies summarized in Appendix A, only 7 out of the 24 studies that used both behavioral and self-report measures of intrinsic motivation found results which co-varied, and only 12 out of the 27 studies that used self-report measures found significant self-report results in the predicted direction.

The lack of evidence from self-report measures, for the changes in self-perception assumed to occur, has been addressed by Nisbett and Wilson (1977) and Wilson, Hull and Johnson (1981). These investigators suggest that there is limited introspective access to higher order cognitive processes. This is indicated by the fact that subjects are sometimes unaware of the existence of a stimuli assumed to influence a response, unaware of the existence of the response itself and unaware that the stimulus caused the response. Only when the influential stimuli are both salient and perceived as a plausible cause of the responses are cognitive assessments accurate. In support of this premise, Wilson et al., in a overjustification study, report a series of studies which showed that only when subjects were requested to do a reasons analysis for their interest in a set of puzzles did the reward manipulation cause similar significant results for both behavioral and self-report measures of intrinsic motivation. Without reasons analysis, only the behavioral measure showed significant differences between the reward and no reward manipulations. These researchers concluded that research does not call for the replacement of self-perception theories to explain overjustification just because of the limited access and awareness people have to the cognitive processes involved. Rather, they suggest, it demonstrates the necessity for investigating the mediating processes.

This argument is of little benefit in supporting the attribution explanation of overjustification used in the overjustification hypothesis. Here theoretically the conceptual variable of interest, intrinsic motivation, is defined in terms of a cognitive event with self-perception of personal causality. However, evidence for the occurrence of this is difficult to ascertain when the dependent measure of this cognition is not susceptible to objective measurement and does not show differences consistently when self-report measures are used. In addition, the behavioral measures have not empirically been shown to have construct validity for the conceptual definition of intrinsic motivation, which is a cognitive one.

Calder and Staw (1975b) have previously raised a similar concern that the self-perceived cause of intrinsic motivation is not necessarily synonymous with its objective cause, nor does it necessarily have the same psychological parameters. At present there is no conclusive evidence to support the assumption that what affects our actual intrinsically motivated behavior also affects our perception of our motivation or vice versa. That is to say, behavioral changes in intrinsic motivation cannot be assumed to depend on changes in self-perception of motivation. Results showing a) that younger children do not necessarily use the reflective cognitive processes proposed, b) that changes in behavior are not always accompanied by changes in the perceived instrumentality of the activity and c) that changes in perceived locus of causality do not always cause changes in interest in the activity, suggest that the overjustification hypothesis is unable to account comprehensively for all the results in the literature.

The overjustification hypothesis-conclusion. What can one conclude, then, about the status of the self-perception processes as the

important mediators between the experimental reward manipulation and the resulting decrease in intrinsic motivation? Despite the argument of Wilson et al. in favor of maintaining such cognitive processes as the central explanatory model, other investigators recognizing the problems outlined above have recently been addressing their research to other possibilities which depend less on detailed cognitive processing.

For example, Pryor and Kriss (1977) suggest that an "availability heuristic" more than a complex cognitive assessment may explain the process of causal inference. Hence, the salience of an element which affects its availability in memory can mediate the causal attribution made to that element, without the necessity of including specific logical content of an information set as proposed by Bem (1972). A recent article by Wood (1982) supports this hypothesis. In a study manipulating reward and access to attitudinally-relevant data, Wood found that subjects who could retrieve data indicating they were in favor of the advocated position, attributed their decision to the belief with no significant effect of reward. The results demonstrate that people rely on currently available cues to explain a recent behavior when they do not have access to information in their memory regarding earlier information.

Other researchers have speculated that the use of social scripts (Abelson, 1976) and learning causal schemata (Kelley, 1972) play important roles in determining causal inferences. Nisbett and Wilson (1977), Ransen (1980), Morgan (1981) and Lepper et al. (1982) have recently shown the plausibility of learned social scripts, which operate in a "mindless manner", acting as mediators between the manipulation of reward and behavioral consequences.

This research indicates a notable shift in orientation among overjustification theorists and investigators away from logical information processing factors toward social learning factors. However, the main difference between these explanations seems to center on the extent of cognitive processing occurring. The consensus among these investigators seems to be that the overjustification phenomenon has received little empirical support for a self-perception explanation.

Cognitive Evaluation Theory

The main hypothesis of Deci's theory is that the offering of a reward for doing an intrinsically interesting activity changes a person's perceived level of self-competence and/or self-determination because of the informational and controlling properties of the reward. The main purpose of studies based on this theory has been to demonstrate, through manipulations of self-determination and competence, that these cognitions influence intrinsic motivation. The constructs of competence and self-determination are operationalized and the controlling and informational aspects of the rewards are manipulated in terms of contingency manipulations, e.g., whether or not the reward is contingent on agreeing to participate in the experiment, or on engaging in the activity for a specified period of time, or on performing to an established criterion. The specification of exactly which components of Deci's theory are being operationalized by any one manipulation in an experiment is often difficult to determine because of the inconsistent use of terminology to describe reward contingencies and the confounding of reward (control) and feedback (competence) variables within a single manipulation.

Reward-as control. In one group of experiments, the control aspect of reward is operationalized by making the reward contingent on successful task completion. The prediction was that when the control aspect of reward is made salient, the reward is perceived as the reason for participation. Hence, the person's sense of self-determination is decreased along with his intrinsic motivation. Deci (1971) demonstrated how intrinsic motivation decreased when undergraduates were paid \$1 for each SOMA puzzle they solved. Subjects who were promised money spent less time solving the puzzles during the subsequent free-period than control subjects who received no payment. These results concur with those of Lepper et al. (1973) except that the latter researchers used an unexpected reward condition as well as the no reward control.

Several other studies investigating the control aspect of reward were done by Deci (1972b), Kruglanski, Friedman, and Zeevi (1971), Kruglanski, Alon and Lewis (1972) and Calder and Staw (1975a). These all demonstrated the overjustification effect for behavioral measures. However, there are little consistent data regarding whether subjects actually perceived a change in either their self-determination or their evaluation of the task. Only Kruglanski et al. (1972) asked subjects about their reasons (external or internal) for working on the task and they found no significant difference between the rewarded and nonrewarded subjects on a self-report measure. Whereas Kruglanski et al. (1971) found no significant difference on self-report measures of intrinsic interest due to the reward manipulation, Calder and Staw (1975a) did find significant differences. However, neither study showed significant differences on one behavioral measure: time volunteered to

do another experiment using the same task. In addition to these inconsistencies, Smith (1974) is reported to have found no differences on behavioral measures of intrinsic motivation from reward manipulations.

Reward as information. Cognitive evaluation theory research which investigates the informational aspect of reward presents a similar inconsistent pattern of results. The informational component is operationalized by making reward contingent on a performance criterion. The cognitive evaluation theory predicts that if payment depends on and therefore indicates successful performance, this competency information will eradicate the controlling effects of the reward and intrinsic motivation will not decrease. Research shows, however, that this does not always occur.

Though the Deci study of 1971 was supposedly investigating only the control variable, the fact that the reward was contingent on subjects' successful completion of each puzzle confounded the control manipulation with information regarding competency. Despite the competency information, intrinsic motivation did decrease when rewards were expected. Therefore, the positive information indicated by them had no positive effect. Similarly, when Kruglanski et al. (1972) rewarded 4th graders who won competitions on a number of games, they found that these rewarded students expressed less liking for the games than those who had won but did not receive any reward. The competency information indicated by the reward did not have the expected positive effect again in this study.

Karniol and Ross (1975b) did, however, demonstrate the positive effects of performance contingent rewards on intrinsic motivation. In

two studies, one with college students and the other with 4 to 9 year olds, they found that when rewards were contingent on task engagement, subjects showed greater intrinsic interest for the task when rewards were given for alleged successes. In the second study with the children, where the degree of success was manipulated, there was no significant difference in intrinsic interest between subjects in the rewarded success condition and the no reward condition. This result was replicated in another similar study (Karniol & Ross, 1977). Thus one can speculate about the amount of eradication of the otherwise negative reward effects that can actually be attributed to the competency manipulation.

Research by Salancik (1975) shows further how competency information indicated by performance contingent rewards does not always have a consistent effect on intrinsic motivation. Subjects were either paid for performing to a specified criterion (which was controlled by the experimenter) or not paid at all. Salancik found unexpectedly that performers who had been led to believe they were successful reported liking and enjoying the task more when not paid than when paid.

Greene and Lepper (1974), Hamner and Foster (1975) and Farr (1976) also manipulated reward contingencies and found no differences in intrinsic motivation when rewards were contingent on a performance criterion compared to when they were contingent on task engagement.

Direct manipulation of information. A final group of studies, which attempt to support cognitive evaluation theory manipulated the informational component directly by using verbal feedback regarding competency. Deci hypothesized that intangible rewards were less likely

to be perceived as the reason for one's behavior. Therefore, no decrease and a possible increase in intrinsic motivation was predicted when they are used.

In the first of such feedback studies (Deci, 1971, study 2), subjects were given verbal reinforcement and positive feedback for doing SOMA puzzles. Deci found that task persistence and subjects' ratings of their enjoyment of and interest in the task did not decrease. The data were interpreted as support for his hypothesis.

One can take exception to this interpretation for several reasons. First, Deci basically succeeded in affirming the null hypothesis in this study. Hence we do not know what contributed to the lack of change and it is logically impossible to prove the absence of an effect (Calder & Staw, 1975b). Secondly, the marginally significant positive increase between the control and feedback groups was decreased when the variance attributable to differences in the performance scores on the pretest was removed. (It should be noted here that in subsequent studies no pretest measures of initial interest were taken in the majority of studies testing cognitive evaluation theory. Typically equal initial levels of intrinsic interest between groups is assumed.) Deci attempted to explain these results by using a post hoc analysis of the different subject characteristics of the control and feedback groups. However, this distinction was based on a statistically nonsignificant analysis from a previous experiment. Furthermore, the intrinsic interest data in the feedback group do not even show a trend in the hypothesized direction. Raw data show that task persistence decreased on the post test after feedback had been given (though this difference was not significant). Thus, this study cannot be accepted as supporting Deci's competence hypothesis.

Another study (Deci, 1972a) also failed to find significant effect for a similar competency manipulation. Though this result was explained in terms of a nonsignificant gender x verbal-reward interaction (Deci et al., 1973), later research did not support this explanation (Smith, 1974; Pittman et al. (1980).

Other results demonstrating the lack of consistent effects of competency information on intrinsic motivation are found in studies by Kruglanski et al. (1975), Fisher (1978), Weiner and Mander (1978) and Philips and Lord (1980).

There are, however, several studies which have indicated support for the basic premises of cognitive evaluation theory and it would be misleading to imply otherwise. For example, studies with children have shown that verbal rewards can mitigate the negative effects of tangible rewards (see Boggiano & Ruble, 1979; Anderson, Manoogian & Reznick, 1976). Further support for the positive effects of competency information was demonstrated by Pittman et al. (1980) and evidence for the occurrence of the self-perception process implied in this theory can be found in a study by Pittman, Cooper and Smith (1977). These supportive studies, however, are less prevalent in the literature than those with unsupportive data.

Cognitive evaluation theory - conclusion. Whereas some studies support the existence and importance of competency and self-determination components of this theory, many other studies do not. The studies reviewed here, and recent reviews, such as Boal and Cummings (1981), show how this research is plagued by problems similar to those discussed in reference to the overjustification hypothesis of Lepper et al. (1973). To summarize, the problems are the lack of consistency in

operational definitions of control and informational aspects of reward, little empirical evidence of causal attributions occurring as assumed, proportionately fewer supportive studies with self-report measures, little covariance between behavioral and self-report measures, and inconsistent results when similar competency and reward manipulations are made. After a decade of research, the cognitive evaluation theory has limited capabilities to explain the unpredicted and inconsistent data which characterize this research.

An Affective Interpretation of the Overjustification Effect

The research reviewed above indicates that neither the overjustification hypothesis nor cognitive evaluation theory have proven to be adequate explanations of the overjustification phenomenon. The recent attempts to investigate explanations other than those based on extensive information processing is evidence that some researchers are unsatisfied with the results of previous studies generated by these theories. (See Morgan, 1981; Boal & Cummings, 1981; Lepper et al., 1982; Wood, 1982.)

The proposition of this thesis is that the cognitive theories of overjustification have not been more successful because they failed to recognize the importance of affect in the process. Affect is implicit in evaluations of self-competence and self-determination, but has been referred to by theorists such as Deci only in terms of being synonymous with attitudes and evaluations of the task. As Fiske (1981) has so clearly stated, though affect, attitudes and evaluations are highly correlated, they are separate psychological concepts. While attitudes and evaluations are simple valenced judgments, affective reaction involve separate positive and negative dimensions which are often uncorrelated.

Recently there has been a resurgence of interest in affect as an important component of social psychological theory building. Leventhal (1980) and Zajonc (1980) have argued that affect can be more fundamental in understanding various processes such as self-evaluation or attitude formation than cognition. One domain in which the theoretical incorporation of an affective component has proven to be highly beneficial is social cognition. Research reviewed by Fiske (1980) and Higgins, Kuiper and Olsen (1980) demonstrates the importance of affect during the encoding, storage and retrieval stages of social information processing. Higgins et al. (1980) strongly urge including "personal factors" in explanations of phenomena, which are rich and complex in affective components, that have previously been described by "impersonal" concepts borrowed from cognitive psychology. Overjustification is one such phenomenon which requires the consideration of such "personal factors".

The thesis of this paper is that affect is a major psychological component of intrinsic motivation that inevitably determines one's subsequent involvement in an activity. Intrinsic motivation decreases when the affect associated with engagement in the activity becomes negative.

The Process

To determine the source of positive or negative affect, how it changes in the overjustification paradigm, and how it actually becomes associated with the activity to affect subsequent behavior are not the purposes of this thesis. However, it may be appropriate to suggest several processes by which affect may influence intrinsic motivation in the overjustification paradigm. These will be addressed in more detail after the results of the present research have been described.

Affect-cognition interaction. The different explanations of how affect might be related to the overjustification effect differ mainly to the extent to which affect is dependent upon detailed information processing. Three views will be briefly described here: those presented by Zajonc (1980) which are pre-cognitive, Bower (1981) which are post-cognitive, and Fiske (1981) which are schema related.

Zajonc (1980) argued on the basis of logic and empirical research against the prevalent models of affect, e.g., Schachter and Singer, 1962, which postulate that it appeared only after considerable cognitive activity. That is, these models assume "before I know how I feel about something I must have information about it." Zajonc, in contrast, suggests that affective reactions are primary, an assertion made previously by Wundt (1907) and Osgood (Bartlett & Osgood, 1942). He maintains that while affect is always present as a companion to thought, the converse is not always true. Zajonc demonstrated that affective reactions can occur without extensive perceptual and cognitive encoding, and are made sooner and with greater confidence than cognitive judgements. Based on this research, Zajonc says that "affect and cognition are under the control of separate and partially independent systems that can influence each other" (p. 151).

Zajonc does not suggest that all affect is pre-cognitive. Sometimes it can be related to what Abelson has called "hot cognitions" (Abelson, 1976). That is, cognitions in which the affect is associated with conceptual elements that have an evaluational aspect. This can be compared to "pure affect", which occurs without conceptual references.

On the basis of this model, then, the affect experienced in an overjustification paradigm would not necessarily be interpreted as the

result of self-perception, or the evaluation of competence or self-determination. Affect can be experienced before this information is processed and, according to Zajonc, can possibly guide the cognitive appraisals and resulting behavior. However, there is some disagreement about Zajonc's interpretation of the cognition research on which he bases his theory (i.e., Lazarus, 1982).

Bower's model (1981) describes the affect-cognition interaction as a post-cognitive model. According to Bower, affect is a type of cognition represented as an emotion node in an associative network of other cognitions. A particular cognitive node is activated either by presentation of corresponding stimulus patterns or by prior activation of an associated thought. The activation of one concept or node, which is the basic process of thought, then spreads from one concept to another through an associative link. In this way, after certain cognitive processes occur, affect is activated in a way that corresponds to the positive or negative emotion which is linked to these conceptual nodes.

Cognitive evaluation theory could accommodate Bower's model of affect quite well into its explanation of the overjustification effect. On the basis of a combination of these two theories, it could be argued that it is the processing of information regarding the lack of competency and self-determination which activates negative affect. An associative link is then established between the activity and negative affect, which, according to Bower, will be activated in later recall upon the presentation of the stimuli, i.e., the activity. This model then, would maintain the dependence of affect, and hence the occurrence of an overjustification effect, on the information processing of competency and self-determination.

A third possible description of affect-cognition interaction, which can illuminate the relationship between affect and the overjustification effect, has been presented by Fiske (1980). Unlike Zajonc, who presents an independent model, or Bower who presents an in-depth model of information processing, Fiske describes affect as a response to categorization of stimuli events, that is to schemas. Whereas Bower maintains that affect is aroused by the individual elements of the information processing, Fiske suggests that affect is stored in the initial act of categorization at the top level of the schematic structure. Therefore, it can be aroused without accessing all the category's features and respective evaluations. According to this model, cognitive evaluation of competency and self-determination are not necessary to produce affect. The overjustification paradigm may fit into a category and cue affect previously associated with a schema also in this category. This model does not suggest a total absence of cognitive processing, but proposes that such activity may not be as extensive as other theories, such as Bower's, maintain. Fiske states that this schema-triggered affect can then become conditioned to the individual stimuli contained in the schema.

A final consideration is that affect may become associated with an activity through a conditioning process. An increase in negative affect while the person is working on the activity (through any of the processes described above) becomes associated with the activity itself and reduces the person's future interest. This formulation is similar to the reinforcement-affect model of attraction proposed by Clore and Byrne (1975). The source of affect may not necessarily be connected to the activity itself, but may be misattributed from a stimulus unrelated to the activity occurring at the same time.

To reiterate, the purpose of the paper is not to test the validity of these theories. However, the present research results do have implications for their relative success in explaining the overjustification effect.

Overjustification Research Revisited

An interpretation of the overjustification research using any of these models focuses on the valence of the affect present in the experimental situation. Such an interpretation can only be speculative since there were no affect measures taken in these studies. Therefore, it is difficult to assess precisely affect which caused the predicted or unpredicted results in any one study. It is possible that various manipulations commonly used in this research could result in a decrease in the positive affect the subject was originally associating with the activity.

Consider first Lepper et al.'s (1973) study in which children were promised a reward for performing the intrinsically interesting drawing activity. The positive affect initially associated with the fun of drawing with magic markers may have decreased because of the negative connotations associated with social scripts (i.e., bribery) provoked by the experimenters' instructions.

The affect interpretation may seem superfluous when one is explaining studies in which manipulations of cognitive processes produced the hypothesized effects. However, its importance becomes evident when one attempts to explain the inconsistent results of studies in which these manipulations did not produce the predicted results, or when the overjustification effect occurred in the apparent absence of these cognitive manipulations. While explanations might be offered to

account for this in terms of, for example, the experimental manipulations being too weak to produce the desired cognitions, lack of manipulation checks in the research makes this difficult to assess. It is hypothesized in this thesis that interest may be influenced by affect generated by relevant cognitions independent of the attribution process or cognitive evaluation process.

One can speculate, for example, that Fisher's (1978) subjects did not demonstrate a decrease in intrinsic motivation, even though they felt a lack of self-determination, because in this experimental situation such perceptions did not evoke negative connotations leading to negative affect. Pay, which was endogenous to the activity (Kruglanski et al., 1976) and normative (Staw, Calder, Hess, & Sandelands, 1980), did not activate cues for negative affect.

In sum, it is possible that the overjustification effect will occur as predicted by the cognitive theories (the overjustification hypothesis or cognitive evaluation theory) only when the manipulations produce changes in affect that parallel the cognitive self-perception changes.

Assumptions

In using an affective model to interpret the overjustification research and the phenomenon in general, there are several assumptions inherent in the propositions that need to be validated in order for the model itself to be valid. The main propositions are that (1) the processing of information concerning self-competence and self-determination is one source of affect that influences subsequent behavior, (2) that affect is not necessarily dependent on these cognitions to produce a decrease in future intrinsic motivation. The assumptions being made, then, are that the cognitions of self-competence and self-determination stimulate strong affective responses and that

affect from sources other than these cognitions can cause similar changes in behavior. The focus of this research, then, is to find empirical support for these propositions.

Purpose and Hypotheses of Present Studies

If this affect interpretation of the overjustification effect is valid, it should be possible, first, to replicate the phenomenon showing that affect data parallel the intrinsic motivation data, and, second, to eliminate the overjustification results by introducing positive affect into the experimental situation which is independent of the cognitive manipulation. Two studies were performed to demonstrate this.

Study 1 is a conceptual replication of the Deci experiment (1971, 1972b) with the addition of an affect measure. In this procedure, the subject is either not promised a reward, promised a reward, or given an unexpected reward for performing an activity for which he previously showed initial interest. The subject is also given either no performance feedback, or positive, or negative feedback. At the end of this manipulation phase, the subject is unobtrusively observed during a free-time period to determine his current level of intrinsic motivation. The following hypotheses were made:

Subjects who were promised rewards for doing the puzzles were expected to show less intrinsic motivation toward working on the puzzles than those who either received no reward or received an unexpected reward.

Subjects who were given positive competency feedback were expected to show more intrinsic interest in the puzzles than those who either received no feedback or negative competency feedback.

Subjects were expected to show patterns of negative affect similar to their patterns of intrinsic motivation. That is, subjects promised rewards for doing the puzzles were expected to show higher negative affect scores than those who received no reward or an unexpected reward; and, subjects given positive competency feedback were expected to show lower negative affect scores than those who received either no feedback or negative feedback.

Subjects' scores on both behavioral and self-report measures of intrinsic motivation were expected to correlate negatively with their scores on the negative affect scale.

Study 2 is similar to study 1. The reward manipulation remained the same, but the feedback conditions are omitted. Instead an affect manipulation independent of the subjects' interaction with the task was introduced. The subject was asked to read either neutral, positive or negative self-statements following the reward manipulation and before the final behavioral measure of intrinsic motivation was taken. The following hypotheses were made:

Subjects who were promised a reward were expected to show less intrinsic motivation toward working on the puzzles than those who either received no reward or received an unexpected reward.

Subjects who were asked to read negative mood induction self-statements were expected to show less intrinsic motivation toward working on the puzzles than those who were asked to read either positive or neutral self-statements.

Subjects who were either promised reward, and also asked to read positive self-statements, were not expected to show a decrease in intrinsic motivation compared to subjects who were promised a reward and

asked to read either negative or neutral self-statements. Subjects who were not promised a reward or who received an unexpected reward, and who were asked to read negative self-statements, were expected to show a decrease in intrinsic motivation compared to subjects in these same conditions who were asked to read either neutral or positive statements.

CHAPTER II

EXPERIMENT 1

Overview

There were three phases to the study. In Phase I subjects were observed unobtrusively to determine their amount of initial interest in the SOMA puzzle. During Phase II subjects worked on the puzzles and were given positive, negative or no competency information, and were given either an expected reward, an unexpected reward, or no reward. At the end of this phase they completed the Multiple Affect Adjective Checklist. During Phase III subjects again were observed unobtrusively to determine their interest in the puzzles after having experienced the manipulations in Phase II. At the end of this phase, subjects completed the Task Reaction Questionnaire and were debriefed.

Method

Subjects

The subjects were 32 male and 58 female introductory psychology students who participated to fulfill part of an introductory psychology course requirement. Students were randomly assigned to each of the nine conditions (there were either three or four males in each condition). All subjects had demonstrated an initial interest in the SOMA puzzle (at least one minute working on the puzzles) during the five minute pre-test period. Although four subjects did not believe the lottery tickets used as the reward were genuine, their data were not eliminated. Two of them were in the control condition and the other two in the expected reward condition and each said during the debriefing that they felt they were being bribed to participate. Hence the manipulation was still effective for these subjects.

Materials

A SOMA (Milton Bradley, Inc.) puzzle was used as the experimental task. This puzzle has been used in several other overjustification studies (Deci, 1971, 1972; Wilson et al., 1981) and it has been shown to be of interest to most college students. The puzzle consists of seven, three dimensional pieces that can be combined to form many configurations (see Appendix B). Four such configurations of low complexity selected from the SOMA puzzle book were each mounted on a 4 x 6 index card; another two unsolvable designs were also used for the observation periods.

The reward was a lottery ticket which would give subjects a 1 in 360 chance to win \$100. The desirability of this reward, compared to the receipt of \$1 or a Provincial lottery ticket, was determined in an early pilot test by asking 256 other introductory students to rank their preference for the three. The lottery ticket was genuine and the draw took place when all the data for the experiment had been collected.

Procedure

Subjects were escorted individually into a small sparsely furnished room and seated at a table on which a partially completed SOMA puzzle, two unsolvable design cards and an assortment of magazines (Newsweek, Sports Illustrated, Toronto Life and Chatelaine) had been placed. Subjects were seated and the experimenter excused herself to get the rest of the test materials. The experimenter left the room and observed the subjects via a video camera for five minutes to determine their initial interest in the SOMA puzzle. The amount of time the subjects spent working on the puzzle (looking at the cards or manipulating pieces, etc.) was recorded. The experimenter then returned and

explained the procedure of the experiment to the subjects. (See Appendix C for instructions.) To reduce evaluation apprehension, the subjects were told that the experiment was concerned with "cognitive styles of problem solving" and reassured them that it was not a test of their abilities. The subjects were told they would be asked to construct several of the designs shown on the index cards using the pieces of the SOMA puzzle. The experimenter demonstrated a sample design. The subjects were told they would work on one configuration at a time, that they would be given approximately 10 minutes to complete it, and that if they were not able to finish it, it was not important. The experimenter explained she would observe the various strategies the subjects used in their solutions. If the subjects were unable to solve the design in ten minutes they were shown a solution by the experimenter in order to avoid the residual effects of an incomplete task (Zeigarnik, 1927). The experimenter sat to the side of the subjects ostensibly recording the subjects' solution strategies. The subjects' failure or success and the amount of time they worked on each design was recorded as a performance measure.

After the subjects had attempted four designs the experimenter told them it was necessary to evaluate the strategies they had used up to that point in order to determine what task to give them next. She excused herself ostensibly to use a computer next door to finish the scoring. Subjects were asked if in the meantime they would consider helping another student to pre-test a checklist he was trying to evaluate. All subjects complied, and completed the Multiple Affect Adjective Checklist. The MAACL was given at this time as it was important to know the subjects' level of negative affect before they

attempted the two unsolvable puzzles that might induce further negative affect. However, information obtained during debriefing indicated that subjects who did work on these unsolvable puzzles enjoyed them and did not seem to change their affect because of them. When subjects had completed this, the experimenter returned and explained that she would be a few minutes longer.

She told the subjects to make themselves comfortable and to feel free to do whatever they wished while they waited. They were requested however not to leave the room. The experimenter then observed the subject again for eight minutes to determine their post-test level of intrinsic interest in the task. After eight minutes the experimenter returned and told the subjects that she would next like them to fill out a questionnaire, after which they were asked specific questions about their reactions to the experiment. They were then debriefed as to the purpose of the experiment and their questions were answered. They were requested not to tell possible participants about the lottery tickets since it was important that subjects not anticipate receiving them.

Reward manipulation. One third of the subjects were not given any indication of a reward during the experiment. The control group subjects were given four lottery tickets each at the end of the experiment. One third of the subjects (expected reward condition) were told that they would be given a lottery ticket (the details were described) for each puzzle they worked on. It was explained that the researcher had received a grant to provide funds for this. It was emphasized that the receipt of the reward was not contingent on their success but simply on their attempt. (This is a significant methodological change from the original Deci design in which the reward

was given for successful solutions. The change was made so as not to confound the competency and self-determination variables.)

In order to increase the salience of the reward (Ross, 1975) the lottery tickets were put on the table in front of the subject. A ticket was given to the subject after he worked on each design. Upon completion of the experiment each subject had received four lottery tickets. A third group of subjects (unexpected reward condition) was given no indication until after they had completed the four designs that they would receive a reward. Before being asked to fill out the Adjective Checklist they were told that the researcher had funds from a research grant and that they would receive four lottery tickets (details were described) for their participation. Subjects were then given the four tickets.

Feedback manipulation. One third of the subjects were given no feedback regarding their level of competency, however, single statements, e.g., "Let's move onto the next one." "Try one more." "Ready to try another?" "Let's keep going." were made after each design was attempted to balance the amount of social interaction between the subject and experimenter across feedback conditions. One third of the subjects were given positive competency feedback, e.g., "You have a very organized approach to solving these which is quite beneficial." "Your solutions are much better than average." "You seem to have the special abilities needed to work at tasks like this." "Your strategies are among the best I've seen so far." A final third of the subjects were given negative competency information, e.g., "You seem to be having problems getting organized.", "Maybe the next one will be easier for you.", "Most people don't have quite as much difficulty with this one.", "Hopefully this one will not give you as much difficulty." Note these statements do not reflect or depend on actual success at reaching a final solution.

Dependent Measures

Intrinsic motivation. Two measures of intrinsic motivation were used, one behavioral and one self-referent. The behavioral measure was the amount of time (in minutes) the subject spent working on the puzzles while the experimenter was out of the room. To determine whether all groups showed equal initial interest in the puzzles, (Deci, 1972a), a pre-test was taken during which the subject was observed unobtrusively for five minutes at the beginning of the experiment. A post-test, during which the subject was observed for eight minutes, followed the manipulations at the end of the experiment. Behavior was defined as the number of minutes spent working on the puzzles. The following behaviors were scored: looking at the cards, manipulating the cards or pieces and obvious staring at the task in concentration.

The self-report measure of intrinsic motivation was the Task Reaction Questionnaire (TRQ) developed by Mayo (1976). (See Appendix E) This scale has been used in a similar study of intrinsic motivation and is described in Fisher (1978). This 39-item scale was developed specifically to measure intrinsic and extrinsic motivation for a particular task. The intrinsic scale contains 23 items and the extrinsic 16 items. The internal consistency reliability is reported by Mayo to be .95 for the intrinsic and .90 for the extrinsic scale. In two separate studies, an assessment was performed on the ability of the intrinsic motivation scale to measure experimental effects which have been demonstrated to affect intrinsic motivation. The results on the intrinsic motivation scale showed a statistically significant effect as predicted. A third study reported by Mayo used a variation of the Deci paradigm and found statistically significant differences for both the

behavioral measures and the scale measure of intrinsic motivation. No significant differences, however, were found on the extrinsic motivation scale. Mayo suggests this may reflect the independence of the two scales and possibly the two kinds of motivation.

Three items of extrinsic scale were dropped from the original scale for this study because they were not applicable to the type of task being used here. These were the items "In order to feel like part of the group I worked diligently on the puzzles.", "I tried to avoid looking like a fool in front of the others by working hard on the puzzles.", "You could say that one thing that influenced how hard I worked was the opportunity to see how effective I was compared to the other subjects." Also two items on the intrinsic scale, numbers 10 and 17 were reworded so that "experimenter" was substituted for the original "others" to make the items more applicable to this study.

Only the 23 item intrinsic scale was scored for this study. Items are rated on a seven-point scale ranging from strongly disagree (1) to strongly agree (7). They pertain to task liking and interest, feelings of accomplishment and challenge, and reasons for performance. In the present study, the reliability of the intrinsic scale of the TRQ was calculated to be .95 using the ALPHA coefficient.

Affect. The Multiple Affect Adjective Checklist (MAACL) developed by Zuckerman, Lubin and Robbins (1965) was used to measure subjects' level of negative affect (see Appendix F). Zuckerman, Lubin, Vogel and Valerius (1964) report the validation of the scales in several experimental situations. Split half reliabilities were reported to be .79 for anxiety, .92 for depression and .90 for hostility. This checklist has been used extensively in studies with undergraduates and it has been demonstrated to be sensitive to transitory mood states

(Polivy, 1981; Polivy & Doyle, 1980; Strickland, Hale & Anderson, 1975; Coleman, 1975). The scale was scored for the three subscales: depression, anxiety and hostility. But, because of the high intercorrelations between these three subscales in this study (see Appendix G) which has also been found in previous studies (see Polivy, 1981), and because it was not important to the purpose of this research to analyze the specific emotion to define the negative affect, the three scores on these scales were added together to give a total negative affect score. For the remainder of this study then, any reference to affect on the MAACL results is to the total negative affect score unless specified otherwise.

Manipulation Checks

Competence. Subjects' perceived level of competence was indicated by their rating on a seven-point scale ranging from strongly disagree (1) to strongly agree (7) of the item "After working on these puzzles I feel like a pretty competent individual." This item is part of the TRQ.

Self Determination. Subjects' perceived level of self determination was assessed by asking them to rate their agreement on two items which were added to the end of the TRQ. These items were "The incentive I was offered had no influence on my interest to do the puzzles." and "I would not have been as motivated to do the puzzles if it wasn't for the incentive offered me." These were rated on a seven-point scale as the competency measure.

Debriefing Questions

Subjects were also asked the following questions at the end of the experiment: "Did you believe the lottery ticket was genuine?", "Did you suspect at any time you were being observed?", "What do you think was the purpose of this experiment?". These questions were answered verbally.

Manipulation Checks

For the self determination measure, only two subjects rated, on a seven point scale, that they moderately disagree (a rating of 2) with the statement "The incentive I was offered had no influence on my interest to do the puzzles." Each of these subjects also moderately agreed (a rating of 6) with the statement "I would not have been as motivated to do the puzzles if it wasn't for the incentive offered me."

An analysis of variance on subjects' ratings of competency showed a significant main effect for the feedback variable (see Table 1). Marginal means presented in Table 2 show the highest ratings of competency in the positive feedback condition and the lowest ratings in the negative feedback condition. A priori analysis of the three feedback manipulations in the no reward condition showed significant differences, as predicted, between neutral and positive feedback for competency ($t(27) = 2.42, p < .02$) and between positive and negative feedback ($t(27) = 3.11, p < .004$), but not between the neutral and negative feedback conditions. The reward manipulation did not significantly affect subjects' perception of their competence. As intended, they appeared not to have considered the reward contingent on their performance level. Hence, it seems the attempt not to confound the competency and self-determination manipulations was successful. The interaction effect was also not significant.

An analysis of variance on subjects' actual performance (amount of time it took them to solve the puzzles) showed no significant differences between conditions (see Table 3 and 4). This suggests that the difference in perceived competence was more likely attributable to the competency manipulation than to actual performance differences.

Table 1

Analysis of Variance Summary Table of Self-rated Competency Scores

Source	df	MS	F	Significance
Main Effects				
Reward	2	.878	.509	.603
Feedback	2	38.411	22.255	.061
Interaction				
Reward x Feedback	4	3.694	2.141	.08
Residual	81	1.726		

Means and Standard Deviations of Scores
for Self Rated Competency for All Conditions

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Feedback	3.30 (1.05)	4.00 (1.56)	4.80 (1.13)	4.03
Positive Feedback	4.70 (.94)	5.30 (1.05)	4.50 (1.50)	4.83
Negative Feedback	2.90 (1.72)	2.30 (1.25)	2.60 (1.34)	2.60
	3.63	3.87	3.97	

Note: a) Higher scores indicate higher competency
b) Standard deviations are in parentheses for all the following tables of means.

Table 3

Means and Standard Deviations of Performance Scores
for All Conditions

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Feedback	27.83 (5.79)	25.41 (4.05)	30.59 (8.39)	27.94
Positive Feedback	24.85 (7.44)	25.61 (7.72)	28.53 (9.27)	26.33
Negative Feedback	29.23 (5.73)	31.37 (5.58)	26.68 (6.23)	29.09
	27.30	27.46	28.60	

Note: Higher scores indicate a longer time to solve puzzles and a lower performance score.

Table 4

Analysis of Variance Summary Table of Performance Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Main Effects				
Reward	2	14.967	.317	.729
Feedback	2	57.786	1.225	.299
Interaction				
Reward x Feedback	4	72.583	1.538	.199
Residual	81	47.184		

Effects of Reward and Competency Manipulations on Intrinsic Motivation

Before investigating whether or not subjects demonstrated differences in affect within the overjustification paradigm, it is necessary to determine whether the overjustification effect actually occurred. There are two ways of assessing this: by testing for differences between those groups for whom the effect was predicted using a priori comparisons tests², and by using a more detailed analysis testing for significant main effects and interactions for the two independent variables. Results of both of these analyses will be presented here.

Replication of the Overjustification Effect

Behavioral measures. Table 5 presents the cell means for the amount of time subjects in the nine conditions spent working on the puzzles during the eight minute free period. Looking at row one we can see an indication of the overjustification effect. Using pooled variance estimates for a priori t-test comparisons it was found, as predicted, that subjects who expected a reward spent less time on the puzzles than those who either received no reward ($t(27) = 3.12$, $p < .004$) or an unexpected reward ($t(27) = 3.07$, $p < .005$). Also as predicted, subjects in the no reward condition spent less time if they were in the negative than neutral feedback group ($t(27) = 3.99$, $p < .001$) and less time if they were in the negative than positive feedback group ($t(27) = 3.59$, $p < .001$). However, there was no significant difference in the amount of time subjects spent on the puzzles between the neutral and positive feedback groups.

To assess the overall independent and interaction effects of the competency and self-determination manipulations a 3 x 3

Table 5

Means and Standard Deviations of the Number of Minutes Spent by Subjects
on Puzzles During the 8 Minute Free Time Period

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Feedback	5.35 (2.79)	1.45 (2.43)	5.29 (3.10)	4.03
Positive Feedback	5.78 (2.94)	3.55 (3.50)	5.62 (2.85)	4.98
Negative Feedback	1.45 (1.45)	1.53 (1.81)	2.18 (3.29)	1.72
	4.19	2.17	4.36	

Note: Standard deviations are in parentheses.

(feedback x reward) analysis of variance was performed on the amount of time subjects spent working on the puzzles during the 8 minute free period. These results are presented in Table 6. The reward variable is highly significant ($F_{(2,81)} = 6.04, p < .004$) as is the feedback variable $F_{(2,81)} = 12.00, p < .001$. Therefore, the hypotheses concerning the effects of feedback and reward on behavioral measures of intrinsic motivation were supported. The marginal means in Table 5 show that the least amount of intrinsic interest in the puzzles occurs when subjects were either promised a reward or given negative feedback. The lack of significant interaction between the reward and feedback variables indicates that the main effects of these variables are constant across all levels of each other.

A 3 x 3 analysis of variance on the subjects' initial level of intrinsic motivation showed no significant differences between groups (see Tables 7 and 8).

Self-report measure. A similar pattern of results was found using the self-report measure of intrinsic motivation; the Task Reaction Questionnaire. Table 9 presents the cell means for the scores on the questionnaire. Lower scores indicate lower intrinsic motivation. Looking at row one we see as predicted that the lowest intrinsic motivation score is in the expected reward condition. However, unlike the behavioral measure, there are only significant differences between the expected and unexpected reward groups ($t(27) = 2.86, p < .001$).

Further analysis of the effects of competency feedback and reward manipulations on the self-report measure showed only a significant main effect for feedback ($F_{(2,81)} = 36.71, p < .001$), but not for reward (see Table 10). Analyses of self report data in the no reward condition between feedback conditions show, as predicted, a significant difference

Table 6

Analysis of Variance Summary Table on Amount of Time
Spent by Subjects Working on the Puzzles

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Main Effects				
Reward	2	44.477	5.903	.004
Feedback	2	84.472	11.212	.001
Interaction				
Reward x Feedback	4	11.290	1.498	.210
Residual	81	7.534		

Means and Standard Deviations for Amount of Time
Spent of Puzzles During a 5 Minute Pre-Test

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Feedback	3.42 (1.74)	3.38 (1.44)	3.49 (1.52)	3.43
Positive Feedback	3.87 (1.66)	3.69 (1.46)	3.50 (1.51)	3.68
Negative Feedback	3.67 (1.50)	3.38 (1.63)	3.70 (1.53)	3.58
	3.65	3.48	3.56	

Table 8

Analysis of Variance Summary Table of Amount of Time
Spent on Puzzles During a 5 Minute Pre-test

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Main Effects				
Reward	2	.209	.084	.819
Feedback	2	.499	.200	.920
Interaction				
Reward x Feedback	4	.231	.092	.985
Residual	81	2.498		

Table 9

Means and Standard Deviations of Scores on the Intrinsic Scale
of the Task Reaction Questionnaire

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Feedback	111.90 (17.77)	103.70 (12.33)	125.90 (20.74)	113.82
Positive Feedback	122.50 (11.78)	123.60 (17.90)	118.60 (16.69)	121.57
Negative Feedback	80.80 (15.92)	85.20 (17.80)	91.60 (19.64)	85.87
	105.07	104.17	112.03	

Note: Higher scores indicate higher intrinsic motivation.

Analysis of Variance Summary Table on Scores

From the Task Reaction Questionnaire Intrinsic Scale

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Main Effects				
Reward	2	555.144	1.930	.152
Feedback	2	10,582.14	36.717	.001
Interaction				
Reward x Feedback	4	533.978	1.853	.127
Residual	81	288.207		

between the neutral and negative conditions ($t_{(27)} = 4.52, p < .001$), and between the positive and negative conditions ($t_{(27)} = 6.06, p < .001$), but not between the neutral and positive feedback conditions. There was no interaction between the feedback and reward variables.

Correlation Between Behavioral and Self-report Measures

Although an overjustification effect was found for both the behavioral and self-report measures of intrinsic motivation, the second being considerably weaker, the correlation between these measures was only marginally significant ($r = .16, p < .06$).

Relationship Between Affect and the Overjustification Effect

Affect and cognitive manipulations. To test the prediction that manipulations of competence and reward would produce differences in negative affect a 3 x 3 analysis of variance was performed on the affect checklist data (see Table 11). As predicted, results showed significant differences as predicted in negative affect of both the reward ($F_{(2,81)} = 6.96, p < .002$) and feedback ($F_{(2,81)} = 4.97, p < .057$) manipulations. The interaction effect was not significant.

Patterns of affect and intrinsic motivation scores. Table 12 presents the cell means for total negative affect scores derived from the Multiple Affect Adjective Checklist. It was predicted that subjects would show a pattern of affect scores which paralleled their intrinsic motivation scores. Visual inspection of this table in comparison with Tables 5 and 9 reveals such similar patterns. In particular, the affect score mirrors the overjustification effect in that the total negative affect in the neutral feedback condition was significantly higher in the expected reward condition than either the no reward ($t_{(27)} = 2.48, p < .01$) or the unexpected reward condition ($t_{(27)} = 4.06, p < .000$). (The reader is referred to Appendix G for results of the different

Table 11

Analysis of Variance Summary Table on Total Negative Affect

Scores from the MAAC1

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Main Effects				
Reward	2	561.60	6.967	.002
Feedback	2	400.67	4.97	.057
Interaction				
Reward x Feedback	4	129.63	1.608	.180
Residual	81	80.606		

Table 12
Means and Standard Deviations of Total Negative
Affect Scores on the MAACL

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Feedback	31.0 (8.36)	40.9 (7.44)	24.7 (10.60)	32.2
Positive Feedback	29.3 (7.80)	33.8 (9.93)	31.43 (9.39)	31.43
Negative Feedback	36.4 (6.88)	40.0 (12.37)	33.6 (6.27)	36.67
	32.23	38.23	29.83	Q

Note: Higher scores indicate more negative affect. Standard deviations are presented in parentheses.

affect subscales, each of which is similar to the total negative affect result.) Analysis of the affect data between the three feedback conditions within the no reward condition, showed a significant difference only between the positive and negative conditions ($t(27) = 2.059, p < .049$).

To assess the correlation between affect and intrinsic motivation scores, the data for the behavioral and self report measures and total negative affect were transformed into z scores within cells to eliminate the effects of feedback and reward manipulations. A Pearson Product Moment Correlation Coefficient was then calculated. (The reader is referred to Appendix G for correlational data of the affect subscales and intrinsic motivation measures.) The correlation between the behavioral measure and total negative affect was not significant ($r = -.12, p < .12$) though it was in the predicted direction. The relation between total negative affect and the self report measure of intrinsic motivation was significant ($r = -.37, p < .001$).

To examine further the relationship between affect and intrinsic motivation, t-tests were performed on the data from the two groups formed from a median split of the total negative affect scores. It was hypothesized that if affect were related to levels of intrinsic motivation, then the high negative affect group should show lower intrinsic motivation scores than the low negative affect group. There was a significant difference between the mean of the high (2.70) and the low (4.48) negative affect groups for the behavioral measure ($t_{(88)} = 2.72, p < .008$) and between the high (98.67) and the low (115.88) negative affect groups on the self-report measure ($t_{(88)} = 3.78, p < .001$). Hence, the high negative affect subjects did show less intrinsic motivation than the low negative affect subjects.

Debriefing Questions

Four subjects did not believe the lottery tickets were genuine. Two of these were in the control condition and two were in the expected reward condition. None of the subjects said they felt they were being observed, and most were surprised to discover the camera over the door located behind them. Three subjects suspected that the MAACL was related to doing the puzzles, but they could not explain the relationship directly. None of the subjects was able to describe the actual purpose of the experiment correctly.

Discussion

The most important finding of this study's replication of the overjustification effect was that increasing negative affect paralleled the decreases in intrinsic motivation, and differed significantly between the experimental conditions in the hypothesized direction. The subjects' experience of decreasing self-determination, from the manipulation of reward expectancy, and of decreasing self-competence, from the manipulation of performance feedback, influenced changes in both their intrinsic motivation and their level of negative affect. This is supportive evidence for the present hypothesis that affect is an important component of the overjustification phenomenon which warrants further empirical consideration.

As found in previous research (Deci, 1971; Lepper et al., 1973; Rosenfield et al., 1980), offering people extrinsic rewards for doing an intrinsically interesting activity will reduce the amount of time they subsequently spend on the activity compared to others who either were not expecting a reward or who were given an unexpected reward. Cognitive evaluation theory explains this in terms of the expected

reward inducing subjects to perceive less self-determination as they attribute the cause of their behavior to be external to themselves. The use of the discounting principle is thought to be responsible for bringing about a change in evaluation of their interest from internal to external. However, only two of these subjects showed any indication that they were aware of the lottery ticket actually influencing their interest in playing with the puzzle. As numerous investigators have already shown, evidence of these cognitive processes actually occurring is limited, perhaps because self awareness of such processes is not always accessible for investigation (cf. Wilson et al., 1981).

Subjects were, however, aware of their negative affect which was significantly affected by the reward manipulation. Subjects in the neutral feedback group who were expecting lottery tickets reported more negative affect after completing the four configurations than those who were either not rewarded or given an unexpected reward. Exactly what aspect of this manipulation produced this negative affect is difficult to assess. Assuming the cognitive processes suggested by Deci did occur, the perceived lack of self-determination might have been the stimulus for it. Another possible explanation is based on debriefing information in which six subjects felt they were being bribed for doing the puzzles, which they claimed was unnecessary because they were fun. Considering the negative connotations typically associated with such social scripts and schemas, as Lepper et al. recently referred to them (Lepper et al., 1982), it is not unreasonable to expect them to evoke considerable negative affect.

Whereas the reward manipulation produced significant main effects for the behavioral measure of intrinsic motivation, it did not produce a

similarly strong effect on the self-report measure of intrinsic motivation. Subjects did not evaluate their liking of, or interest or involvement in the task any less on the TRQ when they have been promised lottery tickets than when they had received them unexpectedly or not at all. This lack of uniformity between behavioral and self-report measures of intrinsic motivation in the overjustification research is not unusual as we have described above (Condry, 1977; Nisbett & Wilson, 1977; Wilson et al., 1981).

One possible explanation extends the point made earlier regarding negative affect being associated with how the work on the puzzles for reward was interpreted as bribery. If this were the case, then the negative affect resulting from the reward manipulation may have been associated with doing the puzzles at that time, but not with the puzzles themselves. That is, the negative affect is associated with the act (doing something for bribery) rather than the activity itself (the SOMA puzzles). Hence a decrease in intrinsic motivation was seen in the act of doing the puzzles, but not in the evaluation of the puzzles themselves as an interesting activity. Subjects who had felt bribed may not have played with the puzzles during the free period because they felt they no longer had to be part of the bribe which was making them feel badly. We are suggesting, then, that perhaps a distinction exists between one's actual intrinsic interest in an activity per se and one's motivation for performing it at a particular time. This will be discussed in more depth below.

The other manipulation in this experiment, the competency feedback, did have a significant effect on both behavioral and self-report measures of intrinsic motivation. Checks on the manipulation and subjects' actual performance levels showed subjects did

not actually differ across groups with respect to their abilities on the puzzles but did perceive competency differences based on the information given them by the experimenter. This feedback also produced significant differences in subjects' level of negative affect. As one would expect, negative competency information resulted in more negative affect. Unlike the negative affect from the reward manipulation, this negative affect seems to have become associated both with the task itself and the experience of working on them as it decreased concurrently with the self-report and behavioral measures of intrinsic motivation.

This study also gives some indication of whether the Independent manipulations of reward and feedback produce any noteworthy interactions; a result most of the previous studies have been incapable of determining because of confounding within the independent variables. We did not find any statistically significant interaction effects between the feedback and reward variables.

This study, then, does demonstrate the presence of negative affect when the overjustification effect occurs. The question remains whether affect is an important component simply as a post cognitive reaction following the self-perception of self-determination and competence, or whether its origin and effects can be independent of these two specific cognitions. Results of the positive feedback manipulation in this study imply how the negative affect from a lack of self-determination can be eliminated. But, here affect from one cognition is simply replaced by affect of the other (competence). Study 2 will attempt to show whether affect is dependent on these cognitions to evoke an overjustification effect. This will be accomplished by inducing affect

which is not related to the task, but which will produce affect contrary to that expected from the cognition of self-determination. If affect is a cause of an overjustification effect, it is expected that intrinsic motivation will decrease when negative affect is induced and increase when positive affect is induced irrespective of the cognition manipulated.

CHAPTER III

EXPERIMENT 2

Method

Subjects

The subjects were 45 male and 45 female introductory psychology students who participated to fulfill part of an introductory psychology course requirement. Students were randomly assigned to each of the nine conditions, with five males and five females in each condition. All subjects had demonstrated an initial interest in the SOMA puzzles during the pre-test period.

Materials

Once again, a SOMA puzzle (Milton Bradley Inc.) was used as the experimental task. Three of the four configurations used in study 1 were employed again; configuration #3 was omitted because only three subjects in the previous study were able to solve it. The same two unsolvable designs were used for the observation periods as in study 1. The reward was a lottery ticket as described in study 1.

Velton's 60 elation, depression and neutral statements were printed individually on 5 x 7 index cards (Velton, 1968).

Procedure

The procedure for this study is similar to that used in study 1 up to the completion of the three configurations. Therefore a summary of that procedure will be presented here; the reader is referred to the procedure in study 1 for more details.

Subjects were individually escorted to a room and seated at a table on which had been placed several magazines, pieces of a partly completed SOMA design and two design cards. The experimenter left the room once

she had seated the subjects and observed them via a video camera for five minutes to determine their initial level of interest in the puzzles. The amount of time they spent working on the puzzle was recorded. The experimenter returned and explained the purpose and procedure of the study to the subjects reassuring them it was not important whether or not they could actually solve the puzzles. (See Appendix D for instructions.) The experimenter sat to the side of the subjects and observed as they worked on the three configurations. As in study 1, the subjects were given ten minutes to complete each design. If they had not finished the experimenter demonstrated a solution and the subjects continued on to the next one. The subjects' success or failure and the amount of time they worked on each design were recorded as a performance measure.

After the subjects had attempted the three designs the experimenter told them it was necessary to evaluate their problem solving strategies data to determine what kind of task to ask them to do next. The subjects were asked if in the meantime they would consider helping another student who was pretesting a mood induction technique. All subjects complied. The experimenter gave the subjects the instructions for the scale (see Appendix I), positive, negative or neutral. If the subjects finished reading the statements before the standard seven and a half minutes were up the experimenter asked the subjects to go back and reread them. During this time the experimenter appeared as if she was busy scoring data.

When the seven and a half minutes were up, the experimenter then told the subjects that she had to use the computer next door to finish her scoring. The subjects were invited to spend this time as they wished, but were requested not to leave the room. The experimenter

then observed the subjects for eight minutes to determine their post test level of intrinsic motivation. This period was videotaped for scoring by a second external rater. After eight minutes, the experimenter returned and told the subjects they would not be required to do any more tasks. The subjects were asked to complete some questionnaires in order to determine how they felt about the puzzles and experiment as a whole. They completed the Multiple Affect Adjective Checklist and the Task Reaction Questionnaire. The order of when these were presented was counterbalanced. The subjects were then asked other questions, as in study 1, regarding their reactions to the rewards, etc. and were debriefed as to the real purpose of the experiment. They were requested not to tell other possible subjects about the lottery tickets since it was important that subjects not anticipate receiving them.

Reward manipulation. This manipulation was identical to the reward manipulation in study one. One third of the subjects were not given any indication of a reward during the experiment. They were given three lottery tickets at the end of the experiment. One third were given the three lottery tickets unexpectedly after they had completed the three configurations. Another third were told they would be given a lottery ticket for each puzzle they worked on. Again it was emphasized that receipt of the ticket was not contingent on their finding a solution, but simply on their attempt. A ticket was given to each of these subjects after they had either completed the design or worked on it for ten minutes. Each subject in this condition also completed the experiment with three lottery tickets.

Affect manipulation. Three different affect conditions were created using Velton's Self Referent Statements (Velton, 1968). This

technique has been used in a substantial number of previous studies to manipulate emotion or mood. While the strong effects of demand characteristics have been suspected, Snyder and White (1982) have provided empirical evidence to support the validity of the actual mood state occurring. The resulting mood changes however have been shown to be more than artifactual by others, and not particularly robust over time (see Polivy & Doyle, 1980; Polivy, 1981).

Subjects were randomly assigned to one of the three conditions. In the Velton elation, Velton depression and Velton neutral conditions subjects were given the standard instructions to read the statements to themselves silently and to attempt to respond to the feeling suggested by the statements. The 60 elation statements progressed from relative neutrality to elation, the 60 depression statements progressed from neutral to depression and the 60 neutral statements were without mood content. Subjects were given seven and a half minutes to read the statements. Subjects who finished before this time was up were told to go back and re-read the statements.

Dependent Measures

Intrinsic motivation. The same two measures used in study 1 were used again in study 2. The behavioral measure was the amount of time subjects spent working on the puzzles during a five minute pre-test and an eight minute post-test while the experimenter was out of the room. The self report measure was the Task Reaction Questionnaire (Mayo, 1976) as described in study 1. The reliability of the intrinsic motivation scale of the TRQ in study 2 was calculated to be .91 using the ALPHA coefficient.

Manipulation Checks

Affect. The Multiple Affect Adjective Checklist (MAACL) (Zuckerman et al., 1965) used in study 1 was used again here as an affect manipulation check as it has been used for other studies in which Velton's mood induction technique was used (see description in study 1). Again there were high intercorrelations between the three subscales (see Table 5, Appendix H). Because of this and the fact that research shows that the self-statements do not produce one discreet mood, but a cluster of positive or negative moods (Polivy, 1981) scores on the three subscales were added together, as in study 1, to give a total negative affect score. For the remainder of this study any reference to affect or MAACL results will be to the total negative affect score, unless specified otherwise.

Competence and self-determination. Subjects' perceived level of competence and self-determination were assessed here using the same items as described in study 1. These were included as part of the Task Reaction Questionnaire.

Debriefing Questions

Subjects were asked the same questions during the debriefing as they had been in study 1 with the addition of the following: "Describe how you felt after reading the statements on the index cards." and "How long did this feeling persist?". A counter mood induction procedure had been prepared for any subjects in the depressed mood condition who still felt in that emotional state as a result of the procedure. However, all subjects reported that the mood had dissipated by the end of the experiment.

Results

Manipulation Checks

On the self-determination measure, all subjects in the expected reward condition rated strong disagreement with the two statements which stated the reward had an effect on their interest in and motivation to work on the puzzles.

An analysis of variance on subjects' self-ratings of competency showed no significant differences across the reward and affect conditions (see Tables 13 and 14). A similar analysis of the subjects' actual performance competence, indicated by the amount of time they required to solve the puzzles, also showed no significant differences across conditions (see Tables 15 and 16). We therefore conclude that none of the affect variation can be attributed to perceived competence or performance differences.

Evidence that the Velton mood induction technique was successful in producing different mood states is found in Table 17 which summarizes the results of a 3 x 3 analysis of variance on the total negative affect score derived from the MAACL. (Results of similar analyses on the three affect subscales can be found in Appendix H.) A significant main effect was found only for the affect manipulation. Subjects' amount of total negative affect was not significantly affected by the reward manipulation.

A priori tests did not show all the hypothesized differences. Unexpectedly, the different mood induction techniques did not produce significant differences within the no reward condition; only the differences between the neutral and negative induction was marginally significant ($t(27) = 1.54, p < .15$). Also, while the affect manipulation appears to have swamped the affect produced by the reward

Table 13

Analysis of Variance Summary Table of Self-rated

Competency Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Main Effects				
Reward	2	2.978	1.816	.169
Affect	2	1.644	1.003	.371
Interaction				
Reward x Affect	4	.978	.596	.666
Residual	81	1.640		

Table 14

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Means and Standard Deviations for Competency Scores

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Affect	4.60 (.96)	3.50 (1.50)	3.90 (.99)	4.00
Positive Affect	4.20 (1.54)	4.10 (1.44)	4.30 (1.56)	4.20
Negative Affect	4.20 (1.13)	3.60 (.69)	3.4000 (1.34)	3.73
	4.33	3.73	3.86	

Table 15

Analysis of Variance Summary Table of Performance

Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Main Effects				
Reward	2	39.27	.777	.463
Affect	2	19.934	.395	.675
Interaction				
Reward x Affect	4	34.007	.673	.613
Residual	81	50.523		

Table 16

Means and Standard Deviations for Performance Scores

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Affect	16.77 (6.9316)	19.02 (5.48)	17.50 (8.97)	17.76
Positive Affect	20.00 (7.41)	20.89 (4.41)	15.38 (7.57)	18.75
Negative Affect	20.30 (7.44)	18.69 (6.60)	19.15 (8.06)	19.38
	18.92	19.53	17.35	

Table 17

Analysis of Variance Summary Table of Total Negative
Affect Scores from MAACL

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Main Effects				
• Reward	2	36.744	.411	.664
• Affect	2	760.744	8.51	.001
Interaction				
Reward x Affect	4	113.394	1.268	.289
Residual	81	89.396		

manipulation (seen in study 1), no significant differences were found within the neutral mood induction condition between the reward conditions as in study 1 (see Table 18). This difference between the two studies in the affect produced by the reward manipulation might be explained by the fact that in study 1 the affect measure was taken directly after the reward manipulation, whereas, in study 2 the affect measure was taken as much as 20 minutes after the manipulation. The differences in results might therefore reflect the difficulty in detecting changes in affect which had dissipated by the time the measurement was taken.

Elimination of the Overjustification Effect

Behavioral measure. A 3×3 analysis of variance showed no significant differences between groups in the five minute pre-test of intrinsic motivation (see Tables 19 and 20).

Table 21 presents the cell means for the amount of time the subjects in the nine conditions spent working on the puzzles during the eight minute free period. As predicted, only in the neutral self-statement condition did the overjustification effect occur. While a priori comparisons did not show significant differences between each of the no reward, expected reward and unexpected reward conditions, comparisons did show that subjects in the expected reward condition spent less time on the task than subjects in the combined no and unexpected reward conditions ($t(27) = 2.49, p < .03$). The positive self statements seemed to counteract the negative effect of the expected reward manipulation even though this mood manipulation was not directly associated with the task.

Using a 3×3 analysis of variance, the results in Table 22 show a main effect for affect only ($F(2,80) = 25.57, p < .001$). Inducing

Table 18

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Means and Standard Deviations of Total Negative Affect Scores on the MAACL

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Affect	28.90 (10.14)	34.50 (9.02)	28.70 (7.94)	30.7
Positive Affect	30.30 (10.11)	24.40 (9.62)	23.10 (12.25)	25.9
Negative Affect	35.30 (7.24)	35.70 (6.23)	37.00 (10.98)	36.0
	31.50	31.53	29.6	

Table 19

Means and Standard Deviations of the Amount of Time
Subjects Spent on the Puzzles During the 5 Minute Pre-test

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Affect	3.21 (1.74)	3.20 (1.68)	2.96 (1.78)	3.09
Positive Affect	3.83 (1.11)	3.61 (1.62)	3.60 (1.43)	3.68
Negative Affect	3.63 (1.73)	3.11 (1.65)	3.01 (1.81)	3.25
	3.53	3.30	3.19	

Table 20

Analysis of Variance Summary Table of the Amount of Time
Subjects Spent on the Puzzles During the 5 Minute Pre-test

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Main Effects				
Reward	2	.866	.324	.724
Affect	2	2.797	1.047	.356
Interaction				
Reward x Affect	4	.272	.102	.981
Residual	81	2.670	.394	

Table 21

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Means and Standard Deviations for the Number of Minutes Spent by Subjects
on Puzzles During the 8 Minute Free Time Period

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Affect	4.69 (3.72)	2.94 (2.58)	6.17 (2.24)	4.60
Positive Affect	6.46 (2.32)	7.00 (2.38)	5.59 (3.31)	6.35
Negative Affect	1.60 (2.14)	1.84 (2.43)	1.41 (1.74)	1.62
	4.25	3.93	4.39	

Table 22

Analysis of Variance Summary Table on Amount of Free
Time Spent by Subjects Working on the Puzzles

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Main Effects				
Reward	2	1.694	.249	.780
Affect	2	171.952	25.248	.001
Interaction				
Reward x Affect	4	14.919	2.191	.077
Residual	81	6.810		

affect into the typical overjustification paradigm from a source unrelated to the task erased the strong effects of reward observed in study I. There was no significant interaction.

Self-report measure. A similar pattern of results exists for the self-report measure of intrinsic motivation, the TRQ (see Table 23). Again the overjustification effect is evident in the neutral affect condition. However, this is a weaker result than the behavioral measure. While a priori comparisons did not show significant differences in intrinsic motivation scores between expected reward, no reward and unexpected reward individually, scores were marginally significantly lower for subjects in the expected reward condition than in the combined no and unexpected reward conditions ($t_{(27)} = 1.88$, $p < .07$): A 3 x 3 analysis of variance showed a significant main effect for affect ($F_{(2,80)} = 5.32$, $p < .007$), but no significant main effect for reward. Like the behavioral measure of intrinsic motivation, there was no significant interaction between the reward and affect variables (refer to Table 24).

Correlation Between Behavioral and Self-report Measures

The behavioral and self-report scores of intrinsic motivation were transformed into z scores within cells to eliminate the effects of reward and affect manipulations. A Pearson Product Moment Correlation Coefficient was calculated between the two measures which showed a significant positive relationship ($r = .21$, $p < .019$) which was higher than the correlation between these measures found in study I ($r = .16$).

Relationship Between Affect and Intrinsic Motivation Scores

Correlations between total negative affect and the intrinsic motivation measures were performed on z score transformations of the affect, behavioral and self-report data. The behavioral measure

Table 23

Means and Standard Deviations of Scores on Intrinsic Scale
of Task Reaction Questionnaire.

Condition	No Reward	Expected Reward	Unexpected Reward	
Neutral Affect	110.60 (26.08)	101.50 (18.07)	120.20 (9.07)	110.77
Positive Affect	112.20 (12.42)	118.40 (9.65)	120.90 (21.66)	117.17
Negative Affect	104.30 (16.89)	100.70 (14.27)	104.90 (12.05)	103.30
	109.33	106.84	115.33	

Note: Higher scores indicate higher intrinsic motivation.

Table 24
 Analysis of Variance Summary Table of Scores From the Task
 Reaction Questionnaire Intrinsic Scale

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Main Effects				
Reward	2	580.344	2.140	.140
Affect	2	1444.978	5.327	.007
Interaction				
Reward x Affect	4	273.161	1.0007	.409
Residual	81	271.241		

scores ($r = -.16$, $p < .06$) and the self-report measure correlated significantly with total negative affect ($r = -.18$, $p < .04$). (The reader is referred to Appendix H for correlation values of each of the affect subscales with each of the intrinsic motivation measures.)

Reliability of Observer Ratings

The correlation between the two observers for determining the amount of time subjects spent working on the task during the free period was .90.

Debriefing Questions

All subjects who had been offered rewards believed the lottery tickets were genuine, except for two who were uncertain. Both of these were in the unexpected reward condition. Two subjects suspected they were being observed, one of these was in the no reward group and the other in the expected reward group. However, each of these thought they were being observed while they were doing the puzzles with the experimenter in the room. None of the subjects were able to describe the true purpose of the study, but 11 distributed across all nine groups, thought the mood induction technique was related somehow to the experiment.

An indication that the majority of subjects took the mood induction procedure seriously is that all but two in the no reward, neutral affect group took the full seven and a half minutes to read the cards. Generally subjects reported that they actually started to feel happy, or depressed, depending on the affect condition they were assigned, while reading the cards. By the end of the debriefing, however, none of the "depressed" subjects reported that they still felt in this mood.

Discussion

The results of this study demonstrate the strong influence that affect can have on the occurrence of an overjustification effect, independent of task related cognitions. Considering that this affect was not associated with the task, therefore precluding the use of the discounting principle or use of the cognitive evaluation processes, to determine it, these results would not have been predicted by either the overjustification hypothesis or the cognitive evaluation theory.

Intrinsic motivation for a particular activity, assessed both from behavioral and self-report measures, can be increased or decreased with the induction of positive or negative affect. In instances where such positive affect is strong enough to become associated with the activity itself, the detrimental effects of offering expected reward for doing the activity are mitigated.

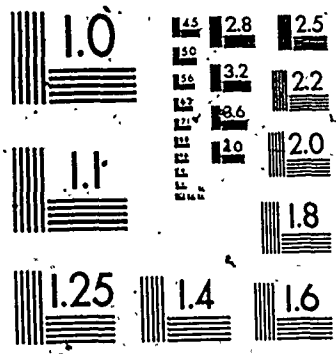
Subjects responded to the promise of reward in the neutral self-statement condition as they did in study 1. Both the behavioral and self-report measures showed a decrease in intrinsic motivation for subjects in the expected reward condition compared to subjects in the combined no reward and unexpected reward conditions. When subjects read positive self-referent statements, the negative effects of the expected reward condition were eliminated. Inspection of marginal means shows subjects who were in the depressed, compared to the positive, self-referent statement condition showed a decrease across all reward conditions.

The affect created by the reading of these self statements was capable of diminishing the overall significance of the reward variable, so that it no longer had a significant main effect on intrinsic

motivation as in study 1. Furthermore, analysis of the data from the MAACL showed no significant differences in total negative affect due to the reward manipulation, and there were also no differences in perceived competence. This supports the hypothesis that affect can have a significant effect on intrinsic motivation independent of the cognitions of self-determination and self-competence which are associated with the activity. This indicates, then, the importance of including affect as a component in any explanation of the overjustification effect.

Compared to study 1 there is a stronger relationship between the behavioral and self-report measures of intrinsic motivation reflected by the significant correlation. This suggests that the evaluation of the activity and one's involvement in it was congruent with the actual interest in engaging in it at that time. However, affect was still a better predictor of the self-report measure of intrinsic motivation than the behavioral measure as indicated by the stronger affect-self-report correlation.

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CHAPTER IV

GENERAL DISCUSSION

Previous studies of the overjustification phenomenon have focused on cognitive information factors; use of the discounting principle, attribution, and evaluation of competency and self-determination, to provide an explanation of this phenomenon. The present studies have extended these cognitive models by considering an affect component.

The findings of this research support the necessity of including an affective component in an explanation of the overjustification effect. The exclusion of affect as an independent contributing factor has produced what, according to cognitive theorists, would be inconsistencies in results. While these results were not predicted by the cognitive manipulations alone, consideration of affective factors would not have made them appear so illusive. The data here show that affect does accompany and parallel the changes in intrinsic motivation as typically produced in the overjustification research. More importantly to the thesis being developed here, study 2 shows that positive affect can eliminate an otherwise occurring overjustification effect when it is induced from a source independent of the specific self-perception and attribution manipulations.

It seems likely, then, that what will determine whether or not a particular reward or type of feedback will decrease one's intrinsic motivation is whether the presentation of this reward and feedback is associated with a negative affective reaction. There is evidence from these studies that such negative affect can influence intrinsic motivation in two ways: when it is associated with the experimental

manipulations themselves, or when it originates from a source other than the reward manipulation. Possible explanations for both of these will be considered next.

Negative Affect: Product of Detailed Cognitive Processes or Schemas?

Self-perception and Attributions

The basic premise being proposed here is that negative affect becomes associated with the SOMA puzzles and as a result, decreases further intrinsic interest in the puzzles. It is possible to explain the source of this negative affect using the self-perception overjustification hypothesis and attributions of the cognitive evaluation theory as models. Negative affect is implicit in processes of perceiving oneself to have a lack of competence and/or self-determination. One way of understanding how this occurs is through considering Bower's (1981) model of affect-cognition interaction in information processing. According to Bower's model, as previously described in the introduction of this thesis, particular cognitions activates affect which is part of the associative network of cognitions. The processing and evaluation of information in the overjustification paradigm, then, results in cognitions of a lack of competency and self-determination which then activates the negative affect associated with these cognitions. This associative link is then activated again when the puzzles are encountered the second time resulting in the lack of intrinsic interest. This explanation maintains that affect is important as a reaction associated with detailed processing of information as described by the self-perception and attribution models.

However, in previous studies (cf. Nisbett & Wilson, 1977; Pinder, 1976; Farr, 1976; Boal & Cummings, 1981) there is little visible evidence that subjects in the present studies actually engaged in the

attributional changes assumed to mediate between experimental manipulations of offering reward and the resulting behavioral changes. Contrary to research supporting the attribution model in which subjects did demonstrate use of the discounting principle when specifically asked to consider how much the reward contributed to their interest in the task (Wilson, et al., 1981), only two out of the total 60 subjects offered lottery tickets for doing the puzzles across both studies indicated on the questionnaire items that the rewards had influenced their motivation or interest in the puzzles.

This of course does not indicate that subjects necessarily failed to use the discounting principle. Rather, the data add to the growing body of research requiring that, if indeed such attribution processes do occur in the overjustification paradigm, there is a need for further methodological development to obtain more explanatory evidence as to the nature and accessibility of these processes. As the present research was not designed to address these issues, any further comment regarding the use of this data to resolve them would be merely speculative. What is important here is whether affect influences intrinsic motivation only after the fact of such extensive information processing.

Study 2 indicates that this is not the case. If we maintain that it is the evaluation and self-perception of competence and self-determination which ultimately determine intrinsic motivation, then we would not predict that interjecting affect with a valence contrary to such evaluations would affect intrinsic motivation. Data here suggest otherwise. Despite the cognitive manipulation, the overjustification effect did not occur when positive affect was interjected between the reward manipulation and the subjects' re-exposure to the puzzles. Because of these results, then, the speculation is made that the

importance of affect in the overjustification phenomenon is not solely explained by its association with detailed self-perception and attribution processes.

Social Schemas

There is, however, some indication that subjects in these studies may have accessed learned social schemas in their reaction to the reward manipulation. During post-experimental interviews, several participants referred specifically to being bribed or "paid off" not to leave the experiment (which, according to the regulations governing the use of introductory psychology students, they were entitled to do). Other subjects when informed about the lottery tickets insisted it was not necessary and were concerned that the money for the lottery was being provided by the experimenter herself.

Unlike expected reward, the unexpected reward manipulation did not seem to be perceived with such negative social connotations. Being rewarded for something they had already done led many subjects to thank the experimenter for their "bonuses". While again several subjects expressed concern regarding the source of the lottery funds and claimed they weren't necessary, many felt they "had earned it".

Fiske (1980) and Higgins et al. (1980) have described how schemas trigger affect. Their premise is that extensive processing and evaluation of information is not always necessary before affect is aroused. Because the affect is encoded and stored as part of the schema, and because it is stored at the top of the schematic structure, affect can be triggered by a stimulus associated with the schema without detailed cognitive processing. In the case of the overjustification paradigm, the negative affect may be aroused by the activation of a "bribery" schema without the evaluations of competency and self-determination occurring. If we accept this model of how affect is

generated in the overjustification paradigm, the occurrence of the mediating cognitive processes is not an issue. Hence, in study 2, this model would not predict that the intervening affect would be irrelevant to the resulting intrinsic motivation. Of course it would also not necessarily predict that it would influence subsequent intrinsic motivation either.

Conclusion

The question is, then, whether the negative affect resulting from the reward manipulations was the product of attributions and self-perceptions or schemas. Considering the lack of response indicating use of the discounting principle either on questionnaire items or during the post-experiment interview, and, considering the verbal reactions which frequently followed the information that subjects would be receiving rewards, it seems more probable that the negative affect was associated with the learned social schemas cued by the reward manipulations. Verbal reactions indicated that subjects interpreted acceptance of the reward as either accepting bribery or taking advantage of a "poor graduate student", both of which have negative connotations. Such schemas may have been cued because payment for participation in psychology research above receiving course credit was not normative (Staw et al., 1980) and such payment was exogenous to the task itself (Kruglanski et al., 1975), thereby requiring subjects to access other social explanations of its meaning.

In conclusion, while no conclusive evidence is forthcoming from this research to indicate either the existence of social schemas or discounting mechanisms, or their being the source of the affect differences in study 1, there is enough information from

post-experimental interviews and verbal responses during the experiment to warrant further serious consideration of the importance of social schemas and the affect associated with them in the overjustification procedure.

The Influence of Affect on Cognitive Processing, Schemas and Recall

Having considered how affect might have been produced and hence associated with intrinsic motivation in study 1, we will next discuss how the affect in study 2 could have produced intrinsic motivation differences opposite to those predicted by the cognitive theorists. To recount the results, in study 2, as in other research (cf. Boal & Cummings, 1981), the typical reward manipulation failed to produce an overjustification effect; in this case, when positive affect independent of the cognitive manipulations was induced. Possible explanations to be pursued below concerns the influence that affect has on (1) cognitive processing and recall of self-referent information which determine whether intrinsic rewards (self-competence, for example) exist and (2) the recall of particular schema.

Cognitive Processing

Intrinsic rewards (i.e., self-competence, challenge, self-determination) are given by individuals to themselves when they feel they are deserved. Intrinsic rewards, then, cannot be taken away or given directly by the environment. As Lawler (1981) has suggested, the environment can only make intrinsic rewards possible. This requires a process of self-evaluation, which results in intrinsic self-reinforcement. This has been described by Bandura (1976) as an important element in understanding motivation.

While Deci has implicated this self-evaluation process in his cognitive evaluation theory of overjustification, he does not recognize

that this cognitive evaluation process can be significantly affected by the mood or affect the person is experiencing. Affect can influence cognitive evaluation and thereby determine whether one rewards oneself with the intrinsic motivators described above and thereby maintain one's intrinsic motivation.

Research which investigates how affect influences cognitive evaluation processes has been recently reviewed by Bower (1981) and Natale and Hantas (1982). Investigators have suggested that mood influences cognitive evaluations of one's experience through biasing what information is selected and processed in the memory. This relationship between cognitive factors and affective states has been the basis of many clinical studies that indicated how depressed moods bias the recall of unpleasant memories, which then further propagate the emotional disorder (Lloyd & Lishman, 1975; Teasdale & Rezin, 1978). Studies by Mischel, Ebbesen and Zeiss (1973) and Isen, Shalke, Clark and Karp (1978) manipulated subjects' affective states by manipulating success-failure experiences and found that positive or negative mood caused the individuals to favor recall of either positive or negative self-descriptions and positive or negative material in memory. Teasdale and Fogarty (1979) and Natale and Hantas (1982) induced positive or negative moods using the Velton (1968) procedure and showed that temporary depression caused subjects to retrieve pleasant memories slower than unpleasant memories, decreased recall of positive life experience, weakened their ability to remember positive information about self, and produced a bias to recall false negative self descriptions. These researchers have concluded that a person's affective response to an event becomes part of the associative network of stimuli generated for long term memory, as well as being influential on active memory coding of personal information.

These findings may be applicable to explanations of why positive affect in study 2 caused an elimination of the overjustification effect even though the typical reward manipulation was conducted assuming affect influences the actual selection and coding of information used in the process, the positive affect created by the self-referent mood statements may have biased the processing of positive self-referent information during the cognitive evaluation process. Consequently the result of the attribution process was positive self-perception in terms of self-determination. Positive information aspects of the reward manipulation were salient because of the positive mood state, thus preventing the usual negative attributions causing the overjustification effect from occurring. Hence positive self-evaluation resulted and intrinsic motivation was maintained.

Social Schemas

Affect may also effect intrinsic motivation by biasing the recall of positive or negative schemas. This is possible if one assumes, as Fiske (1980) suggests, that the affect is stored as part of the schema. Hence, being in a positive mood may have cued positive schemas associated with the puzzle, such as the enjoyment originally experienced working on the puzzles during the pre-test.

Conditioning

A third possibility that cannot be overlooked is that the affect interjected in study 2, was directly associated with the puzzle without intervening cognitive evaluations of schemas. The positive affect may have become conditioned to the puzzles as it occurred at the same time as the puzzle activity.

Conclusion

In summary, the affect in study 2 could have possibly influenced subsequent intrinsic motivation by either biasing the initial coding of personal information used to make the cognitive evaluations which generate the intrinsic rewards, by biasing the recall of associated positive or negative schemas, or by being conditioned to the puzzles through temporal association. The point to be made here is that whichever explanation of overjustification one adopts, affect is still an important determinant as it can strongly influence the processes and types of schemas recalled which directly affect the occurrence of the phenomenon. Further research is needed to determine the most appropriate model of how the cognitions and affect interact.

Related IssuesEffects of Competency Feedback

Results of study 1 indicate that competency information has a highly significant influence on both behavioral and self-report measures of intrinsic motivation. This is not surprising since competency has been considered a central component of intrinsic motivation by many theorists (as discussed in the introduction). What is not so clear in the overjustification literature is the relationship between competency and self-determination.

There is some evidence from investigations by Boggiano and Ruble (1979), Anderson et al. (1976) and Pittamn et al. (1980) that positive competency feedback can mitigate some of the detrimental effects of expected reward. Research by Fisher (1978) suggests however that competency will only be of such benefit to maintaining intrinsic motivation if the person also has a sense of personal control over his performance. Other studies by Deci (1972a), Greene and Lepper (1974)

and Karniol and Röss (1977) however have not replicated this. Such is the case with the present study. The lack of interaction between the feedback and reward manipulations implies that positive feedback did not significantly lessen the negative affects of expected reward on either the behavioral or self-report measures of intrinsic motivation. From an affective perspective, considering the reward manipulation influenced participants' affect considerably more than the feedback manipulation, it is not beyond expectation that the strong negative affect associated with the reward was not overwhelmed by the weaker positive affect from the competency feedback. It seems that competency information will have a beneficial effect on intrinsic motivation only to the extent that the positive affect produced by it is stronger than any negative affect being generated by other aspects of the task situation. If competency is not very important to an individual, then motivation from such information may be difficult to produce. This suggests the importance of considering individual differences in what actually constitutes an intrinsic motivator.

Importance of Individual Differences

Considering the different affective association individuals have to varying social schemas and the differing standards individuals hold for giving themselves intrinsic rewards (i.e., allowing oneself to feel competent), it is not surprising to find considerable variance between subjects in their response to any one experimental manipulation.

Reviewers of the overjustification literature such as Notz (1975) and Condry (1977) have previously called for the consideration of individual differences when predicting overjustification effects.

From an affective perspective, it is especially important to determine the value a person places on specific intrinsic motivators in order to predict whether the inhibition of these motivators will arouse negative affect enough to influence their intrinsic motivation. Hackman and Lawler (1971) did a study with employees of a telephone company that exemplifies this point. They categorized 208 employees who worked on 13 different jobs in terms of "higher order" needs such as accomplishment and personal growth. The jobs were also categorized on four dimensions of variety, autonomy, task identity, and feedback. The results showed that these job characteristics were important and resulted in higher intrinsic motivation (job satisfaction, lower absenteeism, higher quality of work) only for workers who were desirous of such higher order need satisfaction. The strength of such needs seemed to moderate this relationship. Lawler (1981) later made the point that rewards will motivate and lack of rewards will inhibit whatever behavior is seen to lead to rewards if and only if they are important to the individual. Therefore the offering of a reward to someone for whom self-determination is not important will not result in negative affect or a decrease in intrinsic motivation.

Still other investigators concerned with individual differences have found that a person's general tendency to adopt one particular motivational orientation to the exclusion of the other may influence his susceptibility to overjustification procedures. Pittman et al. (1982) report a study by Russell and Pittman (1980) which found that individuals who habitually adopt an extrinsic motivational orientation (which they exemplify as Type A's who have a low priority for leisure time) were more susceptible to overjustification procedures than intrinsically oriented individuals.

The importance of individual differences in what motivators are valued suggests again that it is necessary to consider not the class of motivators or cognitions per se, but the affect associated with them in order to predict their influence on intrinsic motivation.

Dependent Measures of Intrinsic Motivation

Comparison of the data from behavioral and self-report measures of intrinsic motivation in these studies depicts a low co-variation as reported in previous overjustification research (cf. Wilson et al., 1981). In the first study both the reward and feedback manipulations produced significant differences in the behavioral measure, but only the feedback manipulation produced significant differences in the self-report measure. It was suggested earlier that the consistent differences between these two measures might reflect different aspects of intrinsic motivation--between actually doing the puzzle at a particular time under particular circumstances, and interest in the puzzle per se. It was proposed earlier that the reward manipulation might arouse negative affect associated specifically with doing the puzzles (i.e., the schema of accepting bribery) consequently resulting in a decrease in the behavioral measure only, since the aroused negative affect does not necessarily also evoke all the evaluative information associated with the schema (Fiske, 1980). The feedback manipulation however might arouse negative affect associated with evaluating the puzzle itself (being too difficult) as well as doing the puzzle (experiencing failure) thereby resulting in a decrease of interest in the puzzle itself (self report measure) and doing the puzzles (behavioral measure).

In the second study, where affect was not determined solely by task manipulations, there was a significant correlation between the behavioral and self-report measures. Here the "free floating" affect

may have become associated with both the puzzles and the act of doing the puzzles resulting in significant effects for both behavioral and self-report measures.

The findings seem to indicate that it is important to be definitive about whether the overjustification effect is a performance effect (subjects would not do any activity associated with the experiment at that time) or an activity effect (subjects would not do the particular activity that was rewarded). That is, is the overjustification effect related to motivation in general, or to intrinsic motivation for a particular activity?

Further Considerations

Implications for Cognitive Theories of Behavior

The findings of this research lend further support to the positions taken by theorists such as Leventhal (1980), Zajonc (1980), and Higgins et al. (1980) that cognitive information processes are not always adequate to predict or explain specific behavior. The present studies show that the introduction of positive affect into a paradigm which has all the typical cognitive manipulations can eliminate the behavioral pattern predicted by the cognitive theory.

To reiterate, we are not suggesting that the cognitive theorists have been incorrect in their models of behavioral processes, only that they have presented a limited analysis of behavioral determinants whose predictive power may increase if affective components were included.

Implications for a Definition of Intrinsic Motivation

This research supports the colloquial definition of intrinsic motivation--"If it feels good, do it." Sometimes we may be aware of why or how it feels good, but these cognitions are not always accessible or even necessary to determine the motivation for our passions and desires

(be they physical or otherwise). Despite how competent, in control or challenged one feels performing an activity, unless one feels good while doing it, his or her intrinsic interest and motivation will eventually cease. If one is aware of these intrinsic motivators, but at the same time experiences negative affect every time he performs the activity (i.e., disapproval from others, unpleasant memories of past experiences) then eventually these motivators may not be sufficient to sustain his behavior. The positive affect produced by these intrinsic motivators is swamped by the negative affect originating from outside sources. Conversely, a person may experience such strong positive affect when doing something for intrinsic reasons, that no amount of external interference will inhibit his motivation. Hence the researcher fascinated by his or her own findings does not lose interest when he or she receives remuneration.

Perhaps a more comprehensive definition of intrinsic motivation then would be motivation that is evoked and maintained by a person's need to feel good. A certain activity may satisfy this need because it provides cognitions of competency and personal control, because it cues recall of past experiences which have positive affect associations, or because positive affect was misattributed to it when it was performed.

Implications for Motivation Issues in Organizational Psychology

While the overjustification phenomenon has provided fertile ground for social psychologists to test their various attribution and cognitive theories, it has also aroused considerable research interest and theoretical debates in the organizational behavior literature.

Originally it was assumed that the effects of intrinsic and extrinsic rewards were additive (Porter & Lawler, 1968; Lawler, 1973). This was predicted from both expectancy theory (Vroom, 1964) and

reinforcement theory (Skinner, 1968). The Deci (1972) research which demonstrated the detrimental effects that extrinsic rewards can have on intrinsically motivated behavior brought this assumption into question. Because of the implications the additive assumption had for managerial systems being developed at the time that were deliberately designed to provide intrinsically motivating work environments, the overjustification effect became an important issue. Such concepts as job enrichment and power equalization were being incorporated into ongoing organizations which concurrently used contingency payment systems.

Numerous studies followed in the organization behavior literature in an attempt to defend the additive model (see Hamner & Foster, 1975; Boal & Cummings, 1981). Due to the pattern of inconsistent results which followed, the controversy continues. Depending on whether one accepts the additive or non-additive model, one would give different recommendations to a manager. If one accepts the additive model then one would maintain a combined effort to increase both intrinsic and extrinsic rewards in the job setting as Lawler (1973, 1981) has suggested. If one accepts the Deci model then managers should concentrate only on aspects of the job situation which would enhance intrinsic motivation and avoid piece rate and other contingent payment schemes which would inhibit intrinsic motivators. Arguments for and against either strategy have simply chosen those studies from among the numbers that support their model.

The findings of the present studies have two implications for this controversy. First, study 1 does support the nonadditive hypothesis of Deci; intrinsic motivation did decrease with the addition of expected payment. Regardless of the explanation one wishes to adopt for this,

the fact remains that the overjustification effect does occur and subjects' feelings toward their task do become more negative when rewards are offered. However, within an actual work environment where, compared to a lab setting, different uncontrolled and possibly undefined variables exist, such pay contingencies may not necessarily be overjustifying the workers interest. Study 2 supports this position by indicating that the overjustification effects does not necessarily have to occur--that contingent payment systems can be used without the detrimental effects on intrinsic motivation. Furthermore, this can be accomplished without necessarily changing specific aspects of the task itself or the payment system, which considerable research energies are currently being used to assess. Rather, positive affect produced by any aspect of the work environment can mitigate the detrimental effects of reward on intrinsic motivation provided it is strong enough. Exactly what needs to be manipulated within an organization to arouse such positive affect is a question answerable only by the individual organization who should consider the importance of cultural and informal factors as different workers have different priorities and values.

With increasing restraints on possible financial systems, it is becoming more important to determine what the important dynamics are between pay, organizational characteristics and motivation. Lawler (1981) has recently argued for the increasing "importance of considering pay in organizational development efforts because of its importance as a cost factor, potential motivator or behavior, systemic relationship to other important organizational variables and potential for affecting the total organization" and that "basic to the understanding of the impact of pay on organizations is understanding how it influences individual behavior" (p. 9). This research supports Lawler's mandate for more

applied investigations into developing pay systems as part of the total organizational development. Affect from changes in aspects of an organizational climate can have important effects on whether particular pay contingencies will produce positive or negative motivational consequences.

Further Research Considerations

Perhaps one of the more obvious indications for future investigations arising from these studies is the need for further evidence of the role of cognitive information processing (i.e., use of the discounting principle) in the overjustification effect. Increasing numbers of research articles are unable to demonstrate that these processes are being used. Instead, indirect evidence is inferred from the results predicted by the hypotheses associated with the processes. Increased effort needs to be put into developing better methods for demonstrating the existence, instead of the effects, of such processes in the overjustification paradigm.

Secondly, the recent interest in social learning processes, use of social scripts, schemas and more simple heuristics to explain how expected reward affects intrinsic motivation is sustained by this research. Investigations into how one learns scripts, and what cues particular scripts, may indicate what makes one's intrinsic interests either easily influenced or relatively resistant to external interference. It may also help explain the development of intrinsic as opposed to extrinsic motivational orientations recently described by Pittman et al. (1982). The individual differences caused by such differing social learning histories and motivational orientations indicates the necessity to be aware of the consequences of this on doing research designed to produce nomothetical explanations of overjustification.

Thirdly, further efforts to understand the overjustification effect might be more fruitful if the various components of an overjustification situation are understood in terms of their affective characteristics as well as their cognitive interpretations or the social scripts they cue. It is evident from the present studies that even if one is able to manipulate particular cognitions, their effect on resulting motivation will not necessarily be predictable. One would also need to be able to control affective factors associated with the cognitions as well as other powerful affective influences of the situation which may overwhelm those of the cognitive manipulations. Similarly, research regarding the access of social scripts in overjustification situations must also consider the importance of the affect which is associated with these scripts, which is as much a part of the social learning process as the behavior itself. In order to continue these investigations into the relationship between affect and other factors contributing to the overjustification effect it will be necessary to improve the methods currently available to measure affect in such situations.

Finally, further overjustification research must clarify the operational and conceptual definitions of intrinsic motivation and determine what the different dependent behavioral and self-report measures represent. The question remains whether the lack of covariation indicates different aspects of intrinsic motivation--interest in the activity itself and interest in actually doing it at that time. Researchers currently consider the two to be synonymous, that the decrease in task engagement indicates a decrease in actual interest in the puzzles themselves. Self-report measures of interest do not always coincide with this behavior. What may be occurring is a decrease in motivation to do any activity which has been

associated with the part of the experiment when reward manipulations were introduced. This is because the negative affect generated by such manipulations may generalize to participation in the experiment as a whole.

Summary

The present studies indicate that manipulations of expected reward and competency can cause decreases in intrinsic motivation that are accompanied by increases in negative affect. However, affect can influence intrinsic motivation independently of the type of cognitive processes which are assumed to be enacted by the reward and competency manipulations. Positive affect from non-task related sources can eliminate the detrimental effects of expected reward in intrinsic motivation. The results suggest the importance of incorporating affect into explanations of the overjustification phenomenon and models of intrinsic motivation in general. They also indicate the need for future research to explicate the relative efficacy of cognitive and social learning explanations of the overjustification effect and their interaction with affective components to influence intrinsic motivation.

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FOOTNOTES

1. Data were analyzed using gender as an independent variable for Study 1 and 2. There were no main effects for gender in either study. There was one significant interaction in Study 1 (gender x reward for competency), and one significant interaction in Study 2 (gender x reward for the self report). Considering neither of these interactions was replicated in the other study and only two out of a possible 52 interactions were significant, the data are presented without regard to gender.
2. Throughout the analyses of data from Studies 1 and 2, specific planned comparisons have been made. The rationale for doing such comparisons follows that of Keppel (1973, p. 90).

APPENDIX A

Summary Table of Overjustification Research

Summary of Empirical Research

Study	Independent Variables	Behavioral Dependent Variables	SPR	Self Report Dependent Variable	SPR
Anderson et al. (1976)	verbal praise, expected monetary or symbolic reward vs. no reward	time on task	yes		
Boal & Cummings (1981)	task complexity, raise cont vs. noncont	tardiness, amt breaktime, quitting time,	yes	locus of control	no
Boggiano & Ruble (1979)	cont vs. noncont reward, Ss age, absolute standard vs. social comparison feedback	time on task	yes	evaluation of task	no
Calder & Staw (1975)	expected vs. no reward, interesting vs. boring task	time volunteered for another experiment	no	task satisfaction	yes
Deci (1971) #1	reward vs. no reward	time on task	no	task interest & enjoyment	no
#2	reward vs. no reward	absenteeism, quantitative performance	yes		
#3	feedback vs. no feedback	time on task	no	task interest	no
Deci (1972)a	reward vs. after free period vs. no reward, praise vs. no praise	time on task	reward only		

NOTE: SPR = Supported Predicted Results
Cont = Contingent

Study	Independent Variables	Behavioral Dependent Variables	SPR	Self Report Dependent Variable	SPR
Deci (1972)b	noncont vs. no reward	time on task.	yes		
Deci & Cascio (1972)	threat vs. no threat punishment	time on task	yes		
Deci & Cascio (1973)	male/female Ss, male/female Es, pos vs. no feedback	time on task	males only		
Enzle & Ross (1978)	low/high value reward, cont vs. noncont reward			liking task	yes
Farr (1976)	cont vs. noncont reward	time on task	no	personal control	no
Fisher (1978)	control/no control over success, cont vs. noncont reward	time on task	no	personal control job satisfaction Task Reaction Ques.	yes no yes
Folger et al. (1978)	low/high value pay, low vs. high choice	time on task performance measure	yes	task evaluation	no
Greene (1974)	reward vs. no reward cont vs. noncont on performance, interesting noninteresting task	time on task	low interest only		
Greene & Lepper (1974)	reward vs. no reward cont vs. noncont on performance	time on task	yes		

Study	Independent Variables	Behavioral Dependent Variables	SPR	Self Report Dependent Variable	SPR
Greene et al. (1976)	reward vs. no reward, low vs. high interest	time on task	low interest		
Hamner & Foster (1975)	cont vs. noncont reward, low vs. high interest	quantitative and qualitative performance	high interest	interest in task	no
Karniol & Ross (1975)a, #1	cont vs. noncont reward	volunteer for experiment	yes	interest, liking	yes
#2	cont vs. noncont reward, success/failure feedback	time on task	yes		
Karniol & Ross (1977)	cont vs. noncont reward, success/failure feedback	time on task	yes		
Kruglanski et al. (1971)	reward vs. no reward	qualitative performance, volunteer for experiment	yes, no	task enjoyment	no
Kruglanski et al. (1972)	reward vs. no reward			task enjoyment, personal control	yes, no
Kruglanski et al. (1975)	reward/no reward, exogenous vs. endogenous			task interest	yes
Lepper & Greene (1975)	surveillance/no surveillance, expected/unexpected, no reward	time on task	yes		

Study	Independent Variables	Behavioral Dependent Variables	SPR	Self Report Dependent Variable	SPR
Lepper et al. (1973)	expected/unexpected/no reward	time on task quality of performance	yes		
Lepper et al. (1982) #3	reward vs. no reward	time on task quality of performance	yes		
Morgan (1981)	reward vs. no reward, MSCS stages	time on task	yes	liking of task	no
Phillips & Lord (1980)	feedback vs. no feedback reward vs. no reward	time on task quality of performance	no	job satisfaction personal control	no no
Pinder (1976)	cont vs. noncont reward interesting vs. boring task	time on task quality of performance	yes	task satisfaction personal control	no no
Pittman et al. (1977)	reward vs. no reward intrinsic/extrinsic/ no physiological cues	time on task	yes	interest in task	no
Pittman et al. (1980)	pos feedback/pos feedback control info, surveillance	time on task	yes		
Pittman et al. (1982) #1	cont vs. noncont reward	time on task preference for complexity	yes yes	liking	yes
#2	cont vs. noncont reward level of complexity	time on task	no	liking	yes

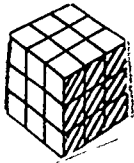
Study	Independent Variables	Behavioral Dependent Variables	SPR	Self Report Dependent Variable	SPR
Pritchard et al. (1977)	reward vs. no reward	time on task	yes	interest	no
Rosenfield et al. (1980)	cont vs. noncont reward feedback vs. no feedback	time on task volunteer for experiment	yes	interest	yes
Ross (1975)	salience of reward	time on task preference	yes	preference	yes
Ross et al. (1976)	reward vs. no reward, task engagement vs. waiting	time on task quality and quantity of performance	yes		
Salancik (1975)	reward vs. no reward success vs. failure feedback	time on task performance	yes	liking, satisfaction difficulty, capability	yes
Smith & Pittman (1978)	no. of trials reward vs. distraction	time on task quality of performance	yes	interest, enjoyment	no
Staw (1974)	removal of extrinsic rewards	quality of performance	yes	satisfaction	yes
Staw et al. (1980)	reward vs. no reward, norm/no norm for pay	volunteer for experiment	no	task satisfaction	yes

Study	Independent Variables	Behavioral Dependent Variables	SPR Variables	Self Report Dependent Variable	SPR
Turnage & Muchensky (1976)	interesting vs. boring tasks, cont vs. noncont reward, choice vs. no choice of reward	time on task	no	interest in task	no
Weiner & Mander (1978)	feedback vs. no feedback cont vs. noncont reward	quality and quantity of performance, volunteer for experiment	reward only comp only	task enjoyment	no

APPENDIX B

SOMA Puzzle Designs

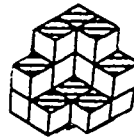
LOW COMPLEXITY



#1



#2



#3
(Study 1)



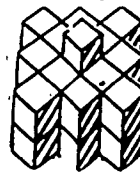
#4

Used for Manipulation Period

UNSOLVABLE



#5



#6

Used for Observation Periods

. APPENDIX C

Instructions to Subjects in Study 1

Instructions to Subjects in Study 1

We are doing research on cognitive styles of problem solving. That is, we are trying to determine the different creative ways people can solve a particular problem. We would like you to solve some problems for us using these blocks. You are to try to replicate these designs (points to configurations) using these blocks. This is not a test of your abilities, we are only interested in your methods. I am going to use a stopwatch, but that is just so I'll know how much time to give you on each design so we won't go over time on the experiment. Remember, it is not important whether or not you complete them. I am only interested in how you try to put the blocks together. While you are doing them, I am going to make a few notes as to what approaches you are using please do not let my watching you disturb your concentration. Do you have any questions?

At this time the subjects in the expected reward conditions were also told:

Beside getting a course credit for participating in this experiment, I am also going to give a lottery ticket for each puzzle you work on for me. These will not depend on whether or not you solve the puzzle or on how well you do; they are simply for your time. Each lottery ticket will give you one chance in 360 to win \$100. The lottery will be drawn during the last week of classes and the winning number will be announced in that week's issue of the Western News.

(Experimenter showed subjects the book of tickets.) Do you have any questions?

Instructions after subjects had completed the puzzles:

To subjects in the expected reward condition -- you now have 1 chance in 90 to win \$100. Please keep these tickets in a place where you won't lose them and be sure to check the last issue of the Western News for this term for the winning number.

To subjects in the unexpected reward condition -- Besides the course credit for participating in the experiment, I am also going to give you four lottery tickets, one for each puzzle you worked on for me. Each lottery ticket will give you one chance in 360 to win \$100. The lottery will be drawn during the last week of classes and the winning number will be announced in the last issue of the Western News for this term. (Experimenter gives the subject the tickets.)

You now have 1 chance in 90 to win \$100. Please keep these tickets in a place where you won't lose them and be sure to check the last issue of the Western News. Do you have any questions?

Instructions then given to all subjects:

I need to analyze your problem solving strategies (indicating her notebook) before I know what kind of task to ask you to do next. In the meantime, would you consider helping out a friend who is working on a mood checklist for the student counselling department? It will only take a few moments. (After subject replies the experimenter gives him a copy of the MAACL.) Please check off any adjectives that describe how you are presently feeling. Do you have any questions? I am going next door to use the computer. I'll return shortly.

The experimenter returned when the subject had finished and told the subject:

I am having problems with the computer. I'll be another 5 to 10 minutes. Please make yourself comfortable and do whatever you wish. So as not to disturb the experiment in the adjoining room please do not leave this room. This delay will not make the experiment run overtime. (Experimenter picks up the completed checklist.) Thanks for doing this, my friend will really appreciate it.

After 8 minutes the experimenter returns and says:

With the information I have it is not necessary for you to do any more tasks for me. However, I'd like to know what you thought about the SOMA puzzles and the experiment in general as this is only a pilot study and I need to know what might need changes. Would you fill out this form? (Experimenter gives the subject a Task Reaction Questionnaire.)

APPENDIX D

Instructions to Subjects in Study 2

Instructions to Subjects in Study 2

Instructions to subjects in Study 2 followed those in Study 1 up to the information given to subjects regarding the lottery tickets after they finished the puzzles. Following that, these instructions were given to all subjects:

I need to analyze your problem solving strategies (indicating her notebook) before I know what kind of task to ask you to do next. In the meantime, would you consider helping out a friend who is working on a mood induction procedure. It will only take about 10 minutes while I am coding this data. (After the subject replies, the experimenter gives him the typed instructions of the Velton mood induction procedure appropriate to the elation, depression or neutral condition, and the deck of cards on which each statement was individually typed.)

The experimenter remained in the room ostensibly coding data. If subjects finished reading the statements before the required 7.5 minutes elapsed the experimenter said:

Please reread each statement again until I ask you to stop.

When subjects finished, the experimenter took the cards and said:

I shall have to go next door to use the computer in order to analyze this data now that I have coded it. I'll be 5 to 10 minutes doing this. Please make yourself comfortable and do whatever you wish. So as not to disturb the experiment in the adjoining room, please do not leave this room.

After 8 minutes the experimenter returned and said:

With the information I already have, it is not necessary for you to do any more tasks for me. However, I'd like to know what you thought about the SOMA puzzles and other aspects of the experiment, as this is just a pilot study and I need to know what might need changes. Would you fill out this form? (Experiment gives the subject a Task Reaction Questionnaire.)

When the subject completed the questionnaire, the experimenter said:

Finally, would you please fill out this checklist by marking any adjective which presently describes how you are feeling.

(Note: the last two instructions were reversed for one half of the subjects to counterbalance the order of presentation of the TRQ and MAACL.)

APPENDIX E

Task Reaction Questionnaire and Scoring for
the Intrinsic Motivation Scale

Task Reaction Questionnaire

Listed below and on the following sheets are a series of statements relating to the group of puzzles that you have just completed. Please take your time and respond thoughtfully and honestly to these statements by indicating the extent to which you agree with each. Thank you.

-
1. There are several important abilities of mine that were required in order to work effectively on the puzzles.

Strongly Moderately Slightly Neither Slightly Moderately Strongly
Agree Agree Agree Disagree Disagree Disagree

2. I liked the idea that I had enough freedom and responsibility to do the puzzles the way I wanted.

Strongly Moderately Slightly Neither Slightly Moderately Strongly
Agree Agree Agree Disagree Disagree Disagree

3. The challenge posed by these puzzles really aroused my interest in them.

Strongly Moderately Slightly Neither Slightly Moderately Strongly
Agree Agree Agree Disagree Disagree Disagree

4. My feelings while completing the puzzles could best be described by the word excitement.

Strongly Moderately Slightly Neither Slightly Moderately Strongly
Agree Agree Agree Disagree Disagree Disagree

5. At various times I felt like I was really achieving something while working on the puzzles.

Strongly Moderately Slightly Neither Slightly Moderately Strongly
Agree Agree Agree Disagree Disagree Disagree

6. Because I knew what the experimenter expected of me, I tried pretty hard to do well.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

7. My desire to have work I did evaluated in a positive light led me to try harder.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

8. My attempts to figure out the purpose of this experiment led me to work hard on the puzzles.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

9. In a situation like this, I usually work hard on the long shot it will pay off in some way.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

10. It is important to me that the experimenter sees me as doing well on the puzzles.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

11. There is something about solving these puzzles I find very appealing.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

12. I enjoyed using what I consider to be a strong natural ability when it comes to these puzzles.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

13. The nice feeling associated with working these puzzles certainly was a determinant of how well I did.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

14. I really become absorbed with the puzzles task while working on it.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

15. These puzzles gave me the opportunity to learn something new and interesting.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

16. The freedom I had to work at my own pace led me to really work hard on the puzzles.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

17. The anticipation of approval and praise from the experimenter was an important factor in keeping me moving along on the puzzles.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

18. There was plenty of opportunity to exercise my ingenuity and inventiveness on these puzzles.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

19. After working for a while, I had the feeling that I was really good at these types of puzzles.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

20. I felt considerable pride in knowing that I was doing well on the puzzles.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

21. The puzzles could accurately be described as fun.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

22. One source of motivation was the opportunity for independent thought and action while working the puzzles.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

23. The puzzles really held my attention from the very beginning.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

24. Working on the puzzles gave me a good opportunity to demonstrate my skills to the experimenter.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

25. Much of my effort on the puzzles was due to the fact that the experimenter was present.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

26. I was somewhat concerned about failing in front of the experimenter.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

27. I felt that if I did not do well in the puzzles, I might be criticized or "put down" by the experimenter.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

28. The unpredictable qualities of the puzzle task were quite intriguing.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

29. These puzzles gave me the opportunity to develop new skills.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

30. After working on these puzzles for a while, I felt like a pretty competent individual.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

31. My talents were effectively utilized in solving these puzzles.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

32. I liked the opportunity I had to decide for myself how I would solve the puzzles.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

33. I would describe my time with these puzzles as a pleasant experience.

Strongly Agree Moderately Agree Slightly Agree Neither Slightly Disagree Moderately Disagree Strongly Disagree

34. The way the experimenter behaved kept my attention on the puzzles.

Strongly Agree	Moderately Agree	Slightly Agree	Neither	Slightly Disagree	Moderately Disagree	Strongly Disagree
-------------------	---------------------	-------------------	---------	----------------------	------------------------	----------------------

35. I was excited by the prospect that I might do better than other subjects.

Strongly Agree	Moderately Agree	Slightly Agree	Neither	Slightly Disagree	Moderately Disagree	Strongly Disagree
-------------------	---------------------	-------------------	---------	----------------------	------------------------	----------------------

36. I feel some responsibility to be a conscientious subject and not mess up the experiment.

Strongly Agree	Moderately Agree	Slightly Agree	Neither	Slightly Disagree	Moderately Disagree	Strongly Disagree
-------------------	---------------------	-------------------	---------	----------------------	------------------------	----------------------

Answer the following questions only if you were offered a reward for doing the puzzles.

While working on the puzzles, did you believe the lottery ticket was genuine?

Yes	No	Uncertain
-----	----	-----------

The incentive I was offered had no influence on my interest to do the puzzles.

Strongly Agree	Moderately Agree	Slightly Agree	Neither	Slightly Disagree	Moderately Disagree	Strongly Disagree
-------------------	---------------------	-------------------	---------	----------------------	------------------------	----------------------

I would not have been as motivated to do the puzzles if it wasn't for the incentive offered me.

Strongly Agree	Moderately Agree	Slightly Agree	Neither	Slightly Disagree	Moderately Disagree	Strongly Disagree
-------------------	---------------------	-------------------	---------	----------------------	------------------------	----------------------

The following items were scored and the ratings summed to determine the subject's self-report measure of intrinsic motivation:

Item # 1, 2, 3, 4, 5, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 28, 29, 30, 31, 32, 33.

Scores could range from a low of 23 to a high of 161.

Scoring key:

7	6	5	4	3	2	1
Strongly Agree	Moderately Agree	Slightly Agree	Neither	Slightly Disagree	Moderately Disagree	Strongly Disagree

APPENDIX F

Multiple Affect Adjective Checklist
and Scoring Procedure

Please check off adjectives that describe how you are presently feeling.

- | | | |
|---------------------------------------|---------------------------------------|--|
| <input type="checkbox"/> active | <input type="checkbox"/> friendly | <input type="checkbox"/> rough |
| <input type="checkbox"/> adventurous | <input type="checkbox"/> frightened | <input type="checkbox"/> sad |
| <input type="checkbox"/> affectionate | <input type="checkbox"/> furious | <input type="checkbox"/> safe |
| <input type="checkbox"/> afraid | <input type="checkbox"/> gay | <input type="checkbox"/> satisfied |
| <input type="checkbox"/> agitated | <input type="checkbox"/> gentle | <input type="checkbox"/> secure |
| <input type="checkbox"/> agreeable | <input type="checkbox"/> glad | <input type="checkbox"/> shaky |
| <input type="checkbox"/> aggressive | <input type="checkbox"/> gloomy | <input type="checkbox"/> shy |
| <input type="checkbox"/> alive | <input type="checkbox"/> good | <input type="checkbox"/> soothed |
| <input type="checkbox"/> alone | <input type="checkbox"/> good-natured | <input type="checkbox"/> steady |
| <input type="checkbox"/> amiable | <input type="checkbox"/> grim | <input type="checkbox"/> stubborn |
| <input type="checkbox"/> amused | <input type="checkbox"/> happy | <input type="checkbox"/> stormy |
| <input type="checkbox"/> angry | <input type="checkbox"/> healthy | <input type="checkbox"/> strong |
| <input type="checkbox"/> annoyed | <input type="checkbox"/> hopeless | <input type="checkbox"/> suffering |
| <input type="checkbox"/> awful | <input type="checkbox"/> hostile | <input type="checkbox"/> sullen |
| <input type="checkbox"/> bashful | <input type="checkbox"/> impatient | <input type="checkbox"/> sunk |
| <input type="checkbox"/> bitter | <input type="checkbox"/> incensed | <input type="checkbox"/> sympathetic |
| <input type="checkbox"/> blue | <input type="checkbox"/> indignant | <input type="checkbox"/> tame |
| <input type="checkbox"/> bored | <input type="checkbox"/> inspired | <input type="checkbox"/> tender |
| <input type="checkbox"/> calm | <input type="checkbox"/> interested | <input type="checkbox"/> tense |
| <input type="checkbox"/> cautious | <input type="checkbox"/> irritated | <input type="checkbox"/> terrible |
| <input type="checkbox"/> cheerful | <input type="checkbox"/> jealous | <input type="checkbox"/> terrified |
| <input type="checkbox"/> clean | <input type="checkbox"/> joyful | <input type="checkbox"/> thoughtful |
| <input type="checkbox"/> complaining | <input type="checkbox"/> kindly | <input type="checkbox"/> timid |
| <input type="checkbox"/> contented | <input type="checkbox"/> lonely | <input type="checkbox"/> tormented |
| <input type="checkbox"/> contrary | <input type="checkbox"/> lost | <input type="checkbox"/> understanding |
| <input type="checkbox"/> cool | <input type="checkbox"/> loving | <input type="checkbox"/> unhappy |
| <input type="checkbox"/> cooperative | <input type="checkbox"/> low | <input type="checkbox"/> unsociable |
| <input type="checkbox"/> critical | <input type="checkbox"/> lucky | <input type="checkbox"/> upset |
| <input type="checkbox"/> cross | <input type="checkbox"/> mad | <input type="checkbox"/> vexed |
| <input type="checkbox"/> cruel | <input type="checkbox"/> mean | <input type="checkbox"/> warm |
| <input type="checkbox"/> daring | <input type="checkbox"/> meek | <input type="checkbox"/> whole |
| <input type="checkbox"/> desperate | <input type="checkbox"/> merry | <input type="checkbox"/> wild |
| <input type="checkbox"/> destroyed | <input type="checkbox"/> mild | <input type="checkbox"/> enraged |
| <input type="checkbox"/> devoted | <input type="checkbox"/> miserable | <input type="checkbox"/> enthusiastic |
| <input type="checkbox"/> disagreeable | <input type="checkbox"/> nervous | <input type="checkbox"/> fearful |
| <input type="checkbox"/> discontented | <input type="checkbox"/> obliging | <input type="checkbox"/> fine |
| <input type="checkbox"/> discouraged | <input type="checkbox"/> peaceful | <input type="checkbox"/> offended |
| <input type="checkbox"/> disgusted | <input type="checkbox"/> pleased | <input type="checkbox"/> outraged |
| <input type="checkbox"/> displeased | <input type="checkbox"/> pleasant | <input type="checkbox"/> panicky |
| <input type="checkbox"/> energetic | <input type="checkbox"/> polite | <input type="checkbox"/> patient |
| <input type="checkbox"/> fit | <input type="checkbox"/> powerful | <input type="checkbox"/> willful |
| <input type="checkbox"/> forlorn | <input type="checkbox"/> quiet | <input type="checkbox"/> wilted |
| <input type="checkbox"/> frank | <input type="checkbox"/> reckless | <input type="checkbox"/> worrying |
| <input type="checkbox"/> free | <input type="checkbox"/> rejected | <input type="checkbox"/> young |

Scoring Key for the Multiple Affect Adjective ChecklistAnxiety:

+1 if checked - afraid, desparate, fearful, frightened, nervous,
panicky, shaky, tense, terrified, upset, worrying

+1 if not checked - calm, cheerful, contented, happy, joyful, loving,
pleasant, secure, steady, thoughtful

Depression:

+1 if checked - alone, awful, blue, destroyed, discouraged, forlorn,
gloomy, hopeless, lonely, lost, low, miserable,
rejected, sad, suffering, sunk, terrible, tormented,
unhappy, wilted

+1 if not checked - active, alive, clean, enthusiastic, fine, fit,
free, gay, glad, good, healthy, inspired,
interested, lucky, merry, peaceful, safe, strong,
whole, young

Hostility:

+1 if checked - angry, bitter, cruel, disagreeable, discontented,
disgusted, enraged, furious, irritated, mad, mean,
offended, outraged, stormy, unsociable, vexed

+1 if not checked - agreeable, amiable, cooperative, friendly, good-
natured, kindly, polite, sympathetic, tame,
tender, understanding, willful

Total Affect:

Sum of the above 3 subscales: anxiety, depression, and hostility

APPENDIX G

Correlation and Analysis of Variance Results
for MAACL Subscales Depression, Anxiety,
and Hostility

Study 1

Table 1
Pearson Product Moment Correlations
Between Affect Scores of MAACL

	DE	AN	HOS	TA
DE		.7086*	.7227*	.9536*
AN			.5152*	.8186*
HOS				.8202*

* $p < .001$

Abbreviations: DE = depression
AN = anxiety
HOS = hostility
TA = total affect

Table 2
 Mean Scores on the MAACL for Subscales
 Within Experimental Conditions

Condition	No Reward			Expected Reward			Unexpected		
	DE	AN	HOS	DE	AN	HOS	DE	AN	HOS
Neutral									
Feedback	14.4	8.3	8.2	19.4	9.9	11.6	11.3	5.7	16.5
Positive									
Feedback	14.0	6.3	9.0	15.7	8.3	9.8	15.2	6.9	9.2
Negative									
Feedback	17.4	8.6	10.4	18.6	10.6	11.4	16.4	8.1	9.2

Table 3:
Pearson Product Moment Correlation Coefficients
Between Affect Subscales and
Intrinsic Motivation Measures

Measure	DE	AN	HOS
Time on Task	-.1315	-.1311	-.1132
TRQ	-.3623*	-.3109*	-.2725*

*p < .01

Table 4
 Summary of F Values from Analyses of Variance on
 Affect Subscale Scores from MAACL

Source	DE	F Values AN	HOS
Main Effects			
Reward	4.729***	6.842****	7.828****
Feedback	2.764*	3.178**	2.750*
Interaction			
Reward x			
Feedback	1.877	1.165	2.007

*p < .07
 **p < .05
 ***p < .01
 ****p < .002

APPENDIX H

Correlation and Analysis of Variance

Results for MAACL Subscales

Depression, Anxiety and Hostility

Study 2

Table 1
 Summary of F Values from Analyses of Variance
 for Affect Scores

Source	DE	F Values AN	HOS	TA
Main Effects				
Reward	.381	.167	.243	.411
Affect	25.248**	5.327***	10.994**	4.77*
Interaction				
Reward x				
Affect	.843	1.592	.741	1.268

*p < .01

**p < .001

***p < .007

Table 2
Pearson Product Moment Correlations
Between Affect Scores of MAACL

	DE	AN	HOS	TA
DE		.7682*	.6130*	.9315*
AN			.5781*	.8742*
HOS				.8069*

* $p < .001$

Table 3
 Pearson Product Moment Correlation Coefficients
 Between Affect Scores and
 Intrinsic Motivation Measures

	DE	AN	HOS	TA
Time on Task	-.1174	-.1723**	-.1825**	-.1628*
TRQ	-.2331***	-.0332	-.1875**	-.1838**

*p < .06

**p < .05

***p < .01

APPENDIX I

Instructions and Statements for
Velton's Mood Induction Technique

Instructions to subjects in both Depression and Elation Conditions:

Please read each of the following statements to yourself. As you look at each statement, focus your observation only on that one.

This is not a memory task, so you should not spend too much time over any card.

These statements are intended to create a certain mood. Your success at coming to experience this mood will largely depend on your willingness to accept and respond to the idea in each statement and to allow each suggestion to act upon you without resistance.

Attempt to respond to the feeling suggested by each statement. Then try to think to yourself as definitely being and moving into that mood state.

If it is natural for you to do so, try to visualize a scene in which you have had such a feeling.

If you feel the urge to laugh, it will probably be because humour is a good way to counteract unwanted feelings or it might be because you feel yourself going into that mood. Try to avoid this reaction.

Elation Mood Statements

1. Today is neither better nor worse than any other day.
2. I do feel pretty good today, though.
3. I feel light-hearted.
4. This might turn out to have been one of my good days.
5. If your attitude is good, then things are good, and my attitude is good.
6. I've certainly got energy and self-confidence to spare.
7. I feel cheerful and lively.
8. On the whole, I have very little difficulty in thinking clearly.
9. For the rest of the day, I bet things will go really well.
10. I'm too absorbed in things to have time for worry.
11. I'm full of energy and ambition--I feel like I could go a long time without sleep.
12. My judgment is keen and precise today. Just let someone try to put something over on me.
13. If I set my mind to it, I can make things turn out fine.
14. I feel enthusiastic and confident now.
15. There should be opportunity for a lot of good times coming along.
16. My favorite song keeps going through my head.
17. Some of my friends are so lively and optimistic.
18. I feel talkative--I feel like talking to almost anybody.
19. I'm full of energy, and am really getting to like the things I'm doing on campus.
20. I'm able to do things accurately and efficiently.
21. I know good and well that I can achieve the goals I set.
22. Now that it occurs to me, most of the things that have depressed me wouldn't have if I'd just had the right attitude.

23. I have a sense of power and vigor.
24. I feel so vivacious and efficient today--sitting on top of the world.
25. It would really take something to stop me now!
26. In the long run, it's obvious that things have gotten better and better during my life.
27. I know that in the future I won't over-emphasize so-called "problems".
28. I'm optimistic that I can get along very well with most of the people I meet.
29. I'm too absorbed in things to have time for worry.
30. I'm feeling amazingly good today!
31. I am particularly inventive and resourceful in this mood.
32. Things look good. Things look great!
33. I feel an exhilarating animation in all I do.
34. I feel highly perceptive and refreshed.
35. My memory is in rare form today.
36. In a buoyant mood like this one, I can work fast and do it right the first time.
37. I can concentrate hard on anything I do.
38. My thinking is clear and rapid.
39. My life is so much fun; it seems to offer so many sources of fulfillment.
40. Things will be better and better today.
41. I can make decisions rapidly and correctly; and I can defend them against criticism easily.
42. I feel industrious as hell. I want something to do!
43. Life is firmly in my control.
44. I wish somebody would play some good loud music!
45. This is great -- I really do feel good -- I am elated about things.

46. I'm really feeling sharp now.
47. This is just one of those days when I'm ready to go!
48. I feel like bursting with laughter -- I wish somebody would tell a joke and give me an excuse.
49. I'm full of energy.
50. God, I feel great!

Depression Mood Statements

1. Today is neither better nor worse than any other day.
2. However, I feel a little low today.
3. I feel rather sluggish now.
4. Sometimes I wonder whether school is all that worthwhile.
5. Every now and then I feel so tired and gloomy that I'd rather just sit than do anything.
6. I can remember times when everybody but me seemed full of energy.
7. Too often I have found myself staring listlessly into the distance, my mind a blank, when I definitely should have been studying.
8. It has occurred to me more than once that study is basically useless, because you forget almost everything you learn anyway.
9. I do feel somewhat discouraged and drowsy -- maybe I'll need a nap when I get home.
10. I'm afraid the fighting in Ireland may get a lot worse.
11. There have been days when I felt weak and confused, and everything went miserably wrong.
12. I've had daydreams in which my mistakes kept occurring to me. -- sometimes I wish I could start over again.
13. I'm beginning to feel sleepy -- my thoughts are drifting.
14. I feel terribly tired and indifferent to things today.
15. Just to stand up would take a big effort.
16. I'm getting tired out. I can feel my body getting exhausted and heavy.
17. At times I've been so tired and discouraged that I went to sleep rather than face important problems.
18. My life is so tiresome -- the same old thing day after day depresses me.
19. I couldn't remember things well right now if I had to.
20. I just can't make up my mind; it's so hard to make simple decisions.

21. I want to go to sleep -- I feel like just closing my eyes and going to sleep right here.
22. I'm not very alert; I feel listless and vaguely sad.
23. I've doubted that I'm a worthwhile person.
24. I feel worn out. My health may not be as good as it's supposed to be.
25. It often seems that no matter how hard I try, things still go wrong.
26. I've noticed that no one seems to really understand or care when I complain or feel unhappy.
27. I'm uncertain about my future.
28. I'm discouraged and unhappy about myself.
29. I've lain awake at night worrying so long that I hated myself.
30. Things are worse now than when I was younger.
31. The way I feel now, the future looks boring and hopeless.
32. Some very important decisions are almost impossible for me to make.
33. Things are easier and better for other people than for me. I feel like there's no use in trying again.
34. Often people make me very upset. I don't like to be around them.
35. It takes too much effort to convince people of anything. There's no point in trying.
36. I fail in communicating with people about my problems.
37. It's so discouraging the way people don't really listen to me.
38. I've felt so alone before that I could have cried.
39. Sometimes I've wished I could die.
40. My thoughts are so slow and downcast -- I don't want to think or talk.
41. I just don't care about anything. Life just isn't any fun.
42. Life seems too much for me anyhow. My efforts are wasted.
43. I'm so tired.

44. I don't concentrate or move. I just want to forget about everything.
45. I have too many bad things in my life.
46. Everything seems utterly futile and empty.
47. I feel dizzy and faint. I need to put my head down and not move.
48. I don't want to do anything.
49. All of the unhappiness of my past life is taking possession of me.
50. I want to go to sleep and never wake up.

Instructions to subjects in the Neutral condition:

Please read each of the following statements to yourself. As you look at each statement, focus your observation only on that one. This is not a memory task, so you should not spend too much time over any card.

Neutral Mood Statements

1. Oklahoma City is the largest city in the world in area, with 631.66 square miles.
2. Japan was elected to the United Nations almost fourteen years after Pearl Harbor.
3. At the end appears a section entitled "Bibliography Notes".
4. We have two kinds of nouns denoting physical things: Individual and mass nouns.
5. This book or any part thereof must not be reproduced in any form.
6. Agricultural products comprised seventy percent of the income.
7. Saturn is sometimes in conjunction, beyond the Sun from the Earth and is not visible.
8. Some streets were still said to be listed under the old names.
9. Many states supply milk for grammar school children.
10. The typography, paper, and binding were of highest quality.
11. The desk was old, and scratched into its surface was a profusion of dates, initials, and pleading messages.
12. When the banyan bent down under its own weight, its branches began to take root.
13. The hope diamond was shipped from South America to London through the regular mail service.
14. The review is concerned with the first three volumes.
15. The ship was ancient, and would soon be retired from the fleet.
16. Slang is a constantly changing part of the language.
17. There is a small article in the local newspaper which indicates acceptance of the kidnapper's terms.
18. Intramatics finds mates for the lonely.
19. 99.1% of Alaska is owned by the federal government.
20. Two men dressed as repairmen will appear shortly after the van pulls up.
21. The wood was discolored as if it had been held in a fire.

22. A light was noticed in the dark outside, and it moved eerily towards the house.
23. Painting in a few other non-European countries is treated in a separate volume.
24. A recent study revealed that one half of all college students were unable to find summer jobs.
25. Provoked arousal and orientation are accompanied by steeper negative shifts.
26. The names on the Christmas mailing list are alphabetically ordered.
27. Significantly, these changes occur during the full moon.
28. West Samoa gained its independence in 1965.
29. The magazine's report was slanted as usual.
30. The map would prove useless as a beginning guide.
31. Black and white pictures are arranged in ten sections.
32. No man worked harder than he.
33. Potter wrote humorous satires on social cynicism.
34. Boeing's main plant in Seattle, employs 35,000 people.
35. The doorkeeper was dressed in red.
36. During the next ten years, the group participated in politics.
37. The organization depended on the people for support.
38. In 1965, Elizabeth made the first state visit by a British monarch to Germany in 56 years.
39. There are some forms in which no oath is required.
40. It was their sixth consecutive best seller.
41. It all fitted in with the officer's story.
42. The merger did not change the company's policy.
43. The mansion was rented by the delegation.
44. Ninety occupations were listed as eligible for the grads in business.

45. Utah is the beehive state.
46. Changes were made in transport of lumber after the border incident.
47. The Chinese language has many dialects, including Cantonese, Mandarin, and Wu.
48. Things were booming once again in the little gold rush town of Angel.
49. At low tide, the hull of the old ship could be seen.
50. A free sample will be given to each person who enters the store.

END

1 6 0 9 8 3

FIN