

LAKEHEAD UNIVERSITY

THE EFFECT OF EXTERNAL MOTIVATORS ON
INTRINSIC MOTIVATION

by

DONALD MALCOLM TALBOT

A THESIS

SUBMITTED TO THE FACULTY OF ARTS
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF ARTS

DEPARTMENT OF PSYCHOLOGY
THUNDER BAY, ONTARIO, CANADA

MARCH, 1977.

ProQuest Number: 10611205

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



ProQuest 10611205

Published by ProQuest LLC (2017). Copyright of the Dissertation is held by the Author.

All rights reserved.

This work is protected against unauthorized copying under Title 17, United States Code
Microform Edition © ProQuest LLC.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

THESES

M.A.

1977

T13

C.1



© Donald Malcolm Talbot 1978

Canadian Thesis on Microfiche
No. 34744

250042

TABLE OF CONTENTS

	Page
ABSTRACT	i
ACKNOWLEDGEMENTS	ii
DEDICATION	iii
INTRODUCTION	1
METHOD	20
Subjects and Design	20
Apparatus and Materials	20
Procedure	21
RESULTS	24
Main Dependent Variable	24
Independent Variable Checks	24
Secondary Dependent Variables	25
DISCUSSION	27
REFERENCES	35
LIST OF APPENDICES	39

ABSTRACT

The main purpose of this thesis was to test a hypothesis derived from the intrinsic-extrinsic motivation paradigm. It was hypothesized that knowing others were getting paid for doing a puzzle task for which one was not getting paid, would cause an increase in the enjoyment one experienced in doing the puzzles. Eighty people participated in the experiment, 40 males and 40 females. Subjects were either paid \$3.00 or nothing to solve the puzzles. Half the paid subjects knew that others were not getting paid and half the unpaid subjects knew that others were getting paid. It was hypothesized that the knowledge/no pay group would find the most enjoyment in doing the puzzles. It was further hypothesized that next in the degree of enjoyment experienced, would be the no knowledge/no pay group, then the no knowledge/pay group, and then the knowledge/pay group. It was also predicted that females would rate the puzzles as less enjoyable in both the pay conditions when compared to males. In the knowledge/no pay condition women were expected to rate the puzzles as more enjoyable than the males with no differences being evidenced in the no knowledge/no pay condition. The data collected were analyzed using a randomized factorial between-groups analysis of variance. No significant differences were found to support the predictions. Possible reasons as to why no significant differences were found in any of the conditions are discussed.

ACKNOWLEDGEMENTS

I wish to thank my advisory committee, Drs. Jim Evans and Irving Taylor for their help with this thesis. Dr. Evans has my added appreciation for his patient persistence, cooperation and tolerance during his period of supervision of this study. In the face of my frequent, often prolonged absences from the university, he managed to retain an apparent calm. For his assistance in constructing the apparatus used in this study, I also thank Gordon Coates. My very special thanks I give to Jan who suffered through all the typings and "final" retypings of this thesis. Without her help, this study could not have been brought to a successful end.

Don Talbot

To Jan.

A great deal of current research is concerned with the effect of external motivators on intrinsic motivation. That is, many researchers are concerned with the effects of money, praise, or any external motivator on intrinsic motivation. It is known that under certain conditions, pay for doing a task can reduce intrinsic motivation. The purpose of the present study was to investigate further factors that may influence motivation.

De Charms (1968) defined the specific terms "intrinsic" and "extrinsic" as they apply to work motivation theory. He proposed:

that whenever a person experiences himself to be the locus of causality of his own behaviour (to be an origin), he will consider himself to be intrinsically motivated. Conversely, when a person perceives the locus of causality for his behaviour to be external to himself (that he is a pawn), he will consider himself to be extrinsically motivated. (p.328)

Deci (1975c) extends this conceptualization by stating that "Intrinsically motivated behaviors are behaviors which a person engages in to feel competent and self determining" (p.61). He further claims, extrinsically motivated behaviors are those which a person undertakes to "receive some extrinsic reward" (p.248). That is to say, if one was to play baseball for a monetary gain, he would be extrinsically motivated, but if he was to play baseball simply because he wanted to, he would be playing because he enjoyed it and according to

Deci (1975c), because he felt competent and self determining when he did it. Feelings of competence and self determination are underlying notions of cognitive evaluation theory (Deci 1975c). Using views of de Charms (1968) and Heider (1959), Deci formulated his theory to account for the various effects on intrinsic motivation when he manipulated external motivators. His theory outlines:

two processes through which rewards can affect intrinsic motivation, a change in perceived locus of causality process and a change in feelings of competence and self determination process. (p.158)

He asserts that external motivators have two aspects, one for controlling and one for giving information. The perceived importance of these two aspects will decide which of the above processes will be introduced. For example, if subjects were paid for participating in a task that was intrinsically interesting and the money or external motivator was important to them, the change in perceived locus of causality process should be triggered and as a result the subjects would experience less liking for the activity, that is, less intrinsic motivation.

Kruglanski (1975) however, has recently explained intrinsic-extrinsic motivation theory using a different framework which he derived from attribution theory. Attribution theory, (Heider, 1958; Jones & Davis, 1965; Kelley, 1967; Nisbett, Valins & Weiner, 1972; Kelley, 1967, 1971a, 1971b, 1971b, 1973), deals with how people make inferences about the determinants of both their own and other people's actions.

Within the framework of attribution theory, causes of behavior are usually explained using an internal-external partition. Internal causes are those that are personal and external causes are those that are environmental. Kruglanski asserts that people perceive all activities as having both personal and environmental content. It is the amount of personal content weighed against the environmental content that decides if a person participates in an activity because he wants to or because of the external reward. That is, it is the consideration of these conditions which decide if one is intrinsically motivated, or extrinsically motivated. In his monograph, Kruglanski introduced the:

distinction between endogenous and exogenous attribution (analogous to the distinction between means and ends) to replace the internal-external partition in the lay explanation of actions. (p.387)

His endogenous-exogenous attribution is best viewed as being a continuum going from least endogenous attribution (exogenous attribution) to most endogenous attribution. An endogenous attribution refers to when people perceive themselves as doing something as an end in itself.

It would appear that Deci's cognitive evaluation theory and Kruglanski's endogenous-exogenous partition may be used interchangeably when predictions are made concerning the effect of extrinsic motivators on intrinsic motivation. From the cognitive evaluation construct, one could say a change in the perceived locus of causality mechanism was in operation, while using the endogenous-exogenous partition, one would explain the same process as exogenous attribution. Similarly,

an explanation from Deci's theory of feelings of competence and self determination would be interpreted by the endogenous-exogenous partitions as being endogenous attributions.

Kruglanski, Riter, Amatai, Margolin, Shabtai & Zaksh (1975) however claim Deci's cognitive evaluation theory has several problems, a) it identifies intrinsic motivation with needs, which are not impartial as are attributions, b) it misidentifies an internal attribution of causality with the need for self determination (competence), and c) it appears to suggest that motives other than those of self determination could not make an activity intrinsically motivating. He states, his simpler endogenous-exogenous partition stays clear of these problems and instead relies on a distinction between "content" and "consequences". That is, when a person is participating in an activity because of its inherent content, Kruglanski refers to this as making more endogenous attributions. In addition, when a person participates in an activity because of what the consequence will be, Kruglanski refers to this as making more exogenous attributions.

While Kruglanski in his criticism does appear to focus on plausible differences in the concepts underlying cognitive evaluation theory and the endogenous-exogenous partition, the two concepts appear to be almost equivalent. As stated earlier, they seem to offer identical predictions with regard to the effect of external motivators on intrinsic motivation. As there is only one research paradigm (Kruglanski et al., 1975 p.744-750) to date in the psychological literature

indicating the two theories might make different predictions, they will be regarded in this thesis as being synonymous in their interpretive adequacy.

There are aspects of the intrinsic, extrinsic concept of motivation that require some clarification. While a few authors take pains to clearly state the intent of the terms they use in this regard, others are not so painstaking. This has led to some obvious misunderstanding of the following terms which have to be defined for use in this thesis. Total motivation is used to refer to the sum of existing intrinsic motivation and extrinsic motivation. Performance refers to the overt behavior exhibited on a task. It is influenced by both intrinsic motivation and extrinsic motivation as well as other factors, such as individual differences in ability, age, sex, and so on. According to Deci (1975c) it has been firmly established in the experimental literature that the use of extrinsic rewards (reinforcements) will improve performance, that is, increase the likelihood of a response. One need only refer to the writings of Skinner (1953, 1966, 1969) or other authors of the behaviorist school, or those involved in eliciting increased sporting performance from athletes, (Caskey, 1966) for further evidence in support of the above statement.

Deci (1975c) states, when an increase in performance is the prime aim rather than interest in intrinsic motivation, extrinsic reward can be effective. That is, if the aim is to motivate a person to take part in an activity which he

may never do again, the use of an external motivator may be the best avenue to take. However, over the long term, such as in competitive sporting situations which might continue a number of years, one would obviously want to increase or at least maintain a high level of intrinsic motivation. The use of extrinsic reward in this circumstance then might well be damaging to intrinsic motivation. With reference to intrinsic motivation and performance, Deci (1975c) makes the following additional comment: "The two must be kept distinct. Although they are related, the relationship between them is not perfect" (p.209). It should be noted, with regard to performance and the use of an extrinsic reward system (motivation), that performance increments will only occur up to a certain point. At some juncture, an increase in motivation may actually cause a decrease in performance. This phenomenon is known as the "inverted U" phenomenon and is well documented in the literature (Hebb, 1955; Tyhurst, 1951; Marshall, 1947; Martens and Landers, 1970). Since performance changes are not of direct interest in this thesis, no further reference will be made to the "inverted U" phenomenon.

The literature regarding intrinsic and extrinsic motivation is generally more concerned with the effect of external motivators on intrinsic motivation. That is, intrinsic motivation has been the dependent measure. As dependent measures of intrinsic motivation, investigators have used: how much an activity is enjoyed, the amount of free time one spends engaged in the activity, reported interest, quality

of task performance, persistence on a task, task satisfaction, number of first contacts with a toy, duration of contact with a toy, whether the toy was the most "fun thing" among other toys, speed in writing headlines, the number of absences from testing, time spent doing a puzzle, organizational turnover, grades in course studies, how much pleasure the task brings, or a combination of these.

Deci (1975c) has suggested there may be differences among some measures at present used as indicators of intrinsic motivation. It seems that some of the above items may not be equivalent measures. For example it is possible to be interested in some activity but not enjoy doing the activity. One can marvel at the wonders of science but not enjoy doing it because one may have no ability in that direction. To date, there is no empirical evidence showing any of the above to be equivalent or superior measures of intrinsic motivation although there does appear a need for this to be done. This thesis will use "enjoyment" as the main dependent measure of intrinsic motivation.

In the area of work motivation, theorists such as Atkinson (1964), Porter and Lawler (1968) and Vroom (1964), recognized the existence of intrinsic and extrinsic motivation. However, similar to many others in the applied field, they assumed that intrinsic and extrinsic motivation were independent. They also assumed that when both intrinsic and extrinsic motivation were at their maximum, total motivation would be at its maximum. At first glance, these assumptions

seem most compelling. However, it has been shown recently that if extrinsic motivation is introduced, intrinsic motivation may be reduced (eg. Deci, 1975c). For example, by paying someone to do a job, the enjoyment they find initially in doing that job may be diminished. Furthermore, factors such as reward contingency, reward expectation, reward salience and other qualitative extrinsic variables have been shown to affect intrinsic motivation in different ways. Though it is clear that performance is usually enhanced when extrinsic motivators are utilized, it is not so clear what occurs to intrinsic motivation when they are used.

In order to test the early assumptions made regarding intrinsic and extrinsic motivation, Deci (1971, 1972a, 1972b, 1975c; Deci & Cascio, 1972; Deci, Benware & Landy, 1974; Deci, Cascio & Krusell, 1975), formulated and examined a number of hypotheses regarding intrinsic and extrinsic motivation. Reasoning from de Charms' (1968) work, Deci predicted a reduction in intrinsic motivation when extrinsic rewards were present. He found support for this prediction when subjects were given an expected reward, contingent on performance. He demonstrated this using different tasks. His findings have been supported by a number of other researchers (Lepper, Green & Nisbett, 1973; Lepper and Green, 1975; Ross, 1975; Ross, Karniol & Rothstein, 1976; Anderson, Manooigan & Reznick, 1976). These studies support the position that when both extrinsic and intrinsic motivation are present in an activity, total motivation may not necess-

arily be at its greatest. However, there have also been studies showing that when external motivators were expected and contingent, they increased the degree to which people enjoyed performing the task. For example, in a field study by Dermer (1975) eighty one store managers were asked to fill out a questionnaire designed to measure how much they enjoyed their work. The questionnaire requested information about several aspects of their job. Performance-contingent extrinsic motivation was measured by good budget performance to attain other rewards. Those rewards included such things as, recognition, increased responsibility, advancement, better supervisory relations, better peer relations, increased pay and job security. Intrinsic motivation was measured by responses to three statements relating to personal growth and development, feelings of accomplishment, and personal satisfaction found in a job well done. The results, in this administrative setting, indicated that enjoyment experienced in one's job was increased when a bonus system was employed to improve productivity.

It appears then that when extrinsic motivators are task inherent, or become a part of an activity, due say to the passage of time, or because of job expectation, that the task in a sense is "unified" allowing the mechanism of feelings of competence and self determination to be activated rather than the perceived change in locus of causality process to occur. As further evidence of this, in a

laboratory experiment Kruglanski, Riter, Amatai, Margolin, Shabatai & Zaksh (1975), also found that when money is inherent to a task (such as payment for one's job) its presence increases enjoyment. In two conceptual replications, they created situations in which the external motivator, money, was first intrinsic to the task itself and second, extrinsic to it. That is, in the first case money was usually considered to be automatically associated with the activity (for example as is money in all gambling games) and in the second case, money was usually not associated with the activity (for example athletic games with children). Their first experiment employed 48 boys. Half played a coin tossing game of heads and tails (usually played for money). The other half assembled wooden blocks to make pictures (a game hardly ever associated with the payment of money). In the money-inherent condition they found an increase in intrinsic motivation when payment was present versus absent. When money was not considered inherent to the task, subjects displayed lower intrinsic interest when paid than when not paid. In another experiment using a stock-market game as the money intrinsic task and an athletic activity as the money extrinsic task, Kruglanski, et al., replicated their previous findings.

When rewards were expected, but not contingent on performance, that is, subjects knew they were to be paid regardless of how they performed, Deci (1972b) found that extrinsic motivators did not change intrinsic motivation.

However, Calder & Staw (1972a) claim this conclusion by Deci to be unjustified from his data because it was based on failing to reject the null hypothesis. They further declare, rather than contingency or noncontingency of a reward being the deciding factor in whether or not decreases in intrinsic motivation occur, the salience of external motivators "may be one of the strongest factors influencing intrinsic motivation" (p.79).

If an external reward is perceived by a person as the reason he is motivated to participate in an activity then the reward is salient to him. Ross (1975) demonstrated the importance of reward salience, in the intrinsic-extrinsic motivation paradigm. He varied salience by manipulating the conspicuousness of a reward. Sixty male and female children were told they were to get a reward for performing an activity (each would get the same reward). In the salient-reward condition, the reward was placed under a box but in clear view of the children while they did the task. In the nonsalient-reward condition, the children were informed only that they would get a prize later. A control was also run and no prize was promised or given. Those who were in the salient-reward condition showed significantly less interest in the activity than either the nonsalient or control groups. Similar results, but not significant in all conditions, were found when in a second experiment, Ross(1975) used a different reward and a different manipulation of salience. Deci (1975c), while he recognizes salience of reward as an

important variable influencing intrinsic motivation, argues that it is not the salience of the reward itself that brings about a reduction in intrinsic motivation but "rather, the salience of the controlling aspect of the reward" (p.156). In most cases, he claims, these will be the same but sometimes they may not be. As an example, he points out that if males were positively rewarded verbally, and these rewards were very salient, one would expect an increase in intrinsic interest. That is, the praise would be perceived as giving information rather than as an attempt to control, so there would be no loss in intrinsic motivation. Recently, Reiss and Sushinsky (1975) also found a decrease in enjoyment in single trials when noncontingent rewards were expected. However, when the rewards were given over repeated trials, they found intrinsic motivation increased. A possible explanation for this finding is that over the long term (repeated trials), reward may come to be construed by the subject as being an inherent part of the activity and thereby increase intrinsic motivation. If this is so, then the findings of Reiss et al., support those of Dermer (1975) and Kruglanski, et al., (1975) already cited.

Deci, (1975c) asserts that intrinsic motivation may be increased as a means of reducing cognitive dissonance (Festinger, 1957). He has reported a number of studies that utilize dissonance theory to explain how the addition of external motivators could influence the enjoyment one finds in doing a task. The basic notion of cognitive dissonance

theory is relevant to how people react when they engage in a public behavior that is discrepant with their private belief. If a person undertakes for a small, insufficient reward, an activity which he does not like and is therefore not intrinsically motivated to do, he will experience dissonance. Doing the task is inconsistent with his internal state. One way he can reduce his dissonance is to credit the activity he is doing as being more enjoyable than he originally thought. That is, he can increase his intrinsic motivation toward the task.

To test the hypothesis that task enhancement would reduce dissonance, Weick (1964) employed the following paradigm. Using male students, he gave half of them a full credit for participating in his experiment. The remaining half he promised a full subject credit for participation but at the last minute told them in a rather brusque, unfriendly manner that they would get no credit after all. After reading a letter from the chairman of the committee of research in the university which forcefully confirmed that the students would get no credit for being in the experiment, the experimenter declared he could not force anyone to stay and continue in the experiment but he would like them to do so. As a result of this appeal, only four of the subjects elected to leave the experiment. The students in this group who remained therefore received no rewards and they probably disliked the experimenter very much because of his attitude toward them. As there was no apparent sufficient

justification for them to remain and do the experiment, they would experience dissonance because they chose to stay. On the other hand, the subjects in the first group who actually received the credit for participating in the experiment would have ample justification for being present and experience no dissonance. The resulting data showed the no credit group rated the experience as more interesting than did the credit group. They also persisted longer, forgot less information, completed more trials, scored fewer penalty points and maintained a more performance-anchored level of aspiration than the credit group.

It should be mentioned, with regard to Festinger's (1957) theory of cognitive dissonance and Bem's (1967) theory of self perception, which has also been used to explain the effect of reward on intrinsic motivation (Calder & Staw, 1975b), that in most circumstances where changes in motivation occur the two offer parallel explanations. Greenwald (1975) in his paper on dissonance versus self perception theory states:

that the two theories are not capable of producing unequivocally contradictory predictions of cognitive consequences of experimental procedures. (p.490)

Since Greenwald's observation on the two theories seems to cap a fairly long controversy as to which theory generates the most useful predictions, this thesis has, mainly for historical reasons, used the explanations afforded by dissonance theory when discussing the data.

Another theoretical framework used as a basis for prediction in the present study was social comparison theory.

This theory was also proposed by Festinger (1954) and contains two basic concepts. First, people have a drive to evaluate themselves, and second, in the absence of objective, nonsocial means, they will evaluate themselves by comparison with other people. Latané (1966) in an edited series of articles by various authors, has provided ample empirical support for this theory. As a demonstration of how social comparison could affect people, Morse and Gergen (1970) exposed male student job applicants to either a "Mr. Clean" or a "Mr. Dirty" who was ostensibly applying for the same job as the subjects or a job different from the student. Mr. Clean was a person whose personal appearance was excellent. He wore a suit, had an air of self confidence and appeared generally well groomed. Mr. Dirty on the other hand was a person who wore dirty trousers, wore no socks, had on a smelly sweatshirt, was unkempt generally, and seemed unsure about what was going on. Each applicant was given ample opportunity to socially compare himself with either one of the stimulus persons while they were filling out their applications for the position. It was found that the presence of the socially desirable stimulus person (Mr. Clean) as a comparison other, reduced self esteem while the presence of the socially undesirable stimulus person (Mr. Dirty) increased self esteem on the part of the applicants.

The purpose of the present study was to examine, in a short term laboratory experiment, the effect that payment of money and subject's knowledge about their own and others

pay conditions might have on intrinsic motivation. The money condition in the paradigm was expected and noncontingent on performance of an activity. In previous research in this area, unpaid subjects have been unaware as to whether or not others were being paid for doing the same task. It was proposed that knowledge awareness would cause an increase in enjoyment for those not being paid. In the present experiment, the measure of intrinsic motivation was "enjoyment" measured on a nine point, bipolar scale. The design employed four different groups, each comprised of ten males and ten females. Payment and no payment comprised one factor and knowledge of opposite pay condition, the second factor. The manipulations resulted in four groups: 1) Knowledge/pay, 2) no knowledge/pay, 3) no knowledge/no pay and 4) knowledge/no pay.

It was hypothesized 1) that the knowledge/pay group would enjoy doing the task least. This prediction was based on the fact that two external factors manipulated in this study were present for this group. First, they were being paid to do the puzzles. It was anticipated that this would reduce intrinsic motivation and result in less enjoyment. Second, reasoning from social comparison theory, it was proposed that because subjects in this group would know that other subjects were not being paid for doing the same task, that this would magnify the reward for these subjects. That is, the reward would seem to be a greater external motivator than it actually was and further tend to reduce intrinsic

motivation.

It was also hypothesized 2) that the no knowledge/pay group would experience more enjoyment than the knowledge/pay group. This prediction was based on the fact that this group would experience only one of the two external factors manipulated in this study.

It was further hypothesized 3) that the no knowledge/no pay group would experience more enjoyment than either of the above two groups. This prediction was based on the fact that there would be no external factors present to reduce intrinsic motivation.

Another hypothesis was 4) that the knowledge/no pay group would find the most enjoyment in the task. This prediction was based on the consideration of the two external factors manipulated in this experiment. First, the group received no payment, which according to dissonance theory, should increase intrinsic motivation. Second, they had knowledge that there were others receiving payment for doing the same activity when they were not. Because of social comparison, this knowledge should be another source of cognitive dissonance and therefore add further to intrinsic motivation.

Up to now, research has shown differences between males and females, on intrinsic motivation, only when verbal reinforcement was used to extrinsically motivate subjects (Deci, 1972a; Deci, Cascio & Krusell, 1973; Deci, 1975c, p.143). Males were found to be more intrinsically motivated than

females in this situation. In view of the changing female role in modern society, where they now expect equal pay for equal work and in general seek equal status, it was also predicted, albeit on very subjective grounds 5) that females would be less intrinsically motivated in both pay conditions when compared to males. This prediction was based on the fact that since subjects attended the experiment in groups, it was a social occasion. Therefore, the opportunity to make comparisons was readily available even when participants were not assigned to the knowledge conditions. It was felt that in this situation, because of the payment, female subjects would be more affected by the opportunity to compare with others than would the males. When females knew they were to be paid an equal amount to men, and since they are often paid less for doing the same work, the payment should become more salient to them than it would to the men. Therefore, they should be more likely than the men to attribute to the payment, the main reason they volunteered to do the experiment. That is, females should perceive the payment as a greater controlling agent than males.

On similar grounds it was predicted 6) that the women in the knowledge/no pay condition should experience more enjoyment than the males. It was also predicted 7) that in the no knowledge/no pay condition there should be no differences between males and females in their rating of enjoyment on the puzzles. Since there were no apparent reasons for females in their comparisons to perceive them-

selves as being treated differently from the men, there should be no differences in the enjoyment they might find in doing the puzzles.

METHOD

Subjects and Design

The subjects were 80 adults, 69 were from the parent body of a swim club and 11 were volunteers from the surrounding community. The design of the experiment was a 2 x 2 x 2 factorial. The first factor was whether or not subjects were informed of the opposite payment condition. The second factor was payment, present or absent, and the third factor was sex, female or male. Within sex groups, subjects were assigned randomly to one of the four different treatment groups.

Apparatus and Materials

The task consisted of simple jigsaw puzzles. Fifteen pictures taken from various popular magazines were mounted and cut into five piece puzzles. A task essentially similar to this has been shown to be intrinsically interesting (Calder & Staw, 1975b). Calder et al., have also shown that for an external reward to "lead to a decrease in satisfaction and persistence on a task" (p.600), intrinsic interest in the activity must be high. They also claim that if the task used in the testing of subjects involved low intrinsic interest then there would be a reinforcement relationship between external rewards and task satisfaction and hence little or no reduction in intrinsic interest could be detected. To ensure the pictures would be of interest to all

subjects, they were selected to cover a wide range of general interest topics.

The major dependent variable in this experiment was how enjoyable the subjects found the task of solving the puzzles. Enjoyment in doing a task has been used previously and successfully in a number of experimental designs as a major dependent variable in research of this type (Deci, Benware & Landy, 1974; Calder & Staw, 1975; Kruglanski, Alon & Lewis, 1972; Kruglanski, Freedman & Zeevi, 1971). Other questions were also asked as filler questions and as a further source of data of possible interest. Appendix A contains a copy of the question sheet subjects filled out.

Procedure

Eight groups of eight subjects containing four males and four females, four groups of four subjects containing two males and two females, for a total 80 subjects, were tested in separate sessions. As each group arrived for testing they were met by the experimenter and informed that they would be participating in a test that would examine the ways in which people solve problems. They were also asked not to discuss the experiment with anyone. The group was then randomly assigned to one of the four treatment groups. If allocated to a knowledge condition, the group was told either, that others would be paid \$3.00 for the task to be done, while they would not be paid, or that they would be paid \$3.00 for the task they were about to do while others would not be paid. It was emphasized at this point that

this arrangement was a necessary part of the experiment and that the purpose would be explained fully when they had completed the task. However, to be as fair as possible to everyone, it was explained that those who were to be paid and those who were not to receive any money, were chosen by random chance. The assignment was done in this manner to reduce the probability that subjects would negatively or positively evaluate themselves in some way.

Subjects assigned to no knowledge conditions were given none of this latter information but were told whether or not they were to be paid. Following these instructions all subjects were taken one at a time to the testing room where they were given a practice puzzle to do. They were also shown how to record the order of selection of the puzzle pieces. Appendix B is a sample of the form used by each subject to record their selections. Each puzzle piece was marked on its back with the symbol A, B, C, D, or E. To increase the saliency of the reward in this experiment, for those subjects who were to receive payment, the money was put on a table in full view at the end of the last puzzle. They were told it would be theirs when they had completed the task. Saliency of a reward has been enhanced in this manner in previous research (Calder et al., 1975b). The length of time the subject took to complete the task was noted without the subjects' knowledge. On completion of the task each subject, after filling in a questionnaire relating to the testing situation, was asked to return to the waiting

room. Because each subject was taken one at a time through the testing room, and the entire procedure for all subjects combined lasted approximately two hours, magazines and other reading material plus a television set were provided as distractions in the waiting room. The participants were asked not to interact with each other while in this room in case they let slip what the experiment entailed. A second experimenter was present in the waiting room to see that no interactions did occur.

At the end of the experiment, subjects were then interviewed, to assess whether they were blind to the true intent of the study. The participants were then debriefed to reveal the true intent of the research and answers given to any questions they had concerning the experiment.

RESULTS

Main Dependent Variable

The major dependent variable in this thesis was the enjoyment the subjects found in doing the puzzles. There were no significant differences among the groups, or between sexes, in their answers to the question asking them how much they enjoyed the puzzles. The data from this question were analyzed using a 2 x 2 x 2 randomized factorial between-groups analysis of variance. The level used for statistical significance was $p \leq .05$. The first two factors were no knowledge/knowledge and no pay/pay. The third factor was female/male. Appendix C (question 3) shows the analysis of variance, means, and standard deviations for the responses to this question.

Independent Variable Checks

Appendix A contains all the questions asked in this study. Three questions, used as independent variable checks were included in the questionnaire. They were, questions 9, 11, and 12. Question 9 asked, "after the instructions were read to you tonight, to what degree did you know that people in other groups will not be paid to do the same puzzles?" The main effect of knowledge was significant ($F(1,72) = 38.925$, $p = .001$, \bar{X} 's, $NK = .350$ and $K = 2.375$); Question 11 asked, "after the instructions were read to you tonight to what degree did you know that people in other groups will be paid

to do the same puzzles?" In this question, the main effect of knowledge was significant ($F(1,72) = 38.584$, $p = .001$, \bar{X} 's, $NK = .325$ and $K = 2.100$), and the two factor interaction for knowledge and pay was also significant ($F(1,72) = 10.737$, $p = .002$). Question 12 asked, "while you were doing the puzzles, to what degree were you aware you were going to be paid for doing them?" The main effect of payment was significant in this question ($F(1,72) = 31.103$, $p = .001$, \bar{X} 's, $NP = .025$ and $P = 1.725$).

Secondary Dependent Variables

Questions 4, 5, 7, and 10 resulted in significant three factor (knowledge x pay x sex) interactions. Responses to these questions were analyzed using a 2 x 2 x 2 factorial analysis of variance for a between-groups design. The level selected for statistical significance was $p < .05$. Question 4 asked, "how difficult did you find the puzzles to be?" The F for the three factor interaction was ($F(1,72) = 4.147$, $p = .043$). Question 5 asked, "if you were to participate in a similar experiment again, to what degree would you be doing it because you wanted to?" The F for the three factor interaction was ($F(1,72) = 3.904$, $p = .049$). Question 10 asked "to what degree did you perceive the puzzles to be play?" The F for the three factor interaction was ($F(1,72) = 4.577$, $p = .034$). These interactions were plotted in a number of different ways. Simple effects analyses and Newman-Keuls post hoc pairwise comparisons of means were also carried out in an attempt to meaningfully interpret these interactions.

However, no clear statement consistent with hypotheses could be made from them. Of the remaining questions asked in this study, one significant difference was found. The main effect of knowledge was significant ($F(1,72) = 4.636$, $p = .033$, \bar{X} 's, $NK = 1.350$ and $K = 1.925$), for question 6. This question asked, "if you were to participate in a similar experiment again, to what degree would you be doing it for other reasons than because you wanted to?"

DISCUSSION

In the present study, two external motivators were used in an attempt to induce predicted effects on the enjoyment one might find in doing a series of puzzles. One of the motivators was payment and the other was knowledge. No significant effects were found due to either payment or knowledge, despite the fact, already reported, that previous research has shown money to significantly reduce the enjoyment one finds in doing a task.

To account for the failure of this study to at least replicate the finding that payment can reduce intrinsic interest, as measured by enjoyment, the following points should be considered.

Calder and Staw (1975b, p.600) assert that if enjoyment is low to begin with, any manipulation of extrinsic factors would produce no effects. The data in appendix C indicate that perhaps the enjoyment the subjects found in doing the puzzles in this study was not at a high enough level for any effects of an extrinsic reward to be detected. The NK/NP group, who were not paid for their part in the experiment and had no knowledge of other conditions, were essentially a control group. Therefore, their ratings of the puzzles should reflect a reasonably true level of how enjoyable the puzzles really were to the subjects used in the present study. Subjects in the NK/NP group found the puzzles to be only a little over

slightly enjoyable ($\bar{X} = 1.65$, $SD = 0.75$). Only one group (female) rated the puzzles even as high as "enjoyable" (a two rating) on the scale which had a positive polarity of very, very, enjoyable (a 4 rating). The overall enjoyment rating by all subjects was $\bar{X} = 1.69$ ($SD = 1.05$). Therefore payment, which has been shown to decrease enjoyment, may not have been significantly effective in this instance because the enjoyment the subjects experienced in doing the puzzles was not at a high enough level.

The analyses of the responses to the questions asked as independent variable manipulation checks indicate that the intended manipulations were successful. The knowledge groups as well as knowing whether or not they were to be paid also knew that other subjects were or were not being paid. The no knowledge groups knew whether they were to be paid or not paid for their part in the experiment and had little awareness of pay conditions different from their own. Question 11, which related to knowing about other subjects being paid, showed a significant two factor interaction. The difference between the NK and the K groups was greater for the nonpaid subjects than for the paid subjects. This interaction seems understandable since K/NP subjects were specifically told about subjects who were being paid while K/P subjects were only told about subjects who were not being paid.

A second factor to which the failure of this study to achieve significant results might be attributed, is the

perceived saliency of an external motivator. Saliency has been used to refer to the conspicuousness of the reward. In a salient reward condition, for example, Ross (1975) placed the reward under a box but in clear view of children while they did a task. In the nonsalient reward condition the children were told only that they would get a prize later. Other researchers have also used saliency in this context (Deci, 1975c; Calder & Staw, 1975b). It has been found, that increasing the saliency of a reward by making it conspicuous, will cause a decrease in enjoyability.

In the present study, an attempt was made to make the three dollar external motivator conspicuous. Each subject who was paid for doing the puzzles was told in the initial briefing that he would be paid three dollars for doing the puzzles. Again, just prior to their doing the puzzles, the subjects were retold they were to be paid three dollars and that the money would be theirs to keep when they finished the task. At this point, their attention was drawn to the three dollars displayed at the end of the last puzzle. Further, the responses by the pay groups to question 12, which asked subjects how much they were aware they were going to be paid for doing the puzzles, resulted in a mean of 1.73 and SD of 1.90. A rating of 2 on the scale is a response of, "to a moderate degree". Therefore, it appears that the reward probably was conspicuous enough.

However, a second component of a reward, "sufficiency", as described by Deci (1975b), seems to be important if the reward is to affect intrinsic motivation. The sufficiency

of a reward has to do with its quantification. It is a quantity of reward which causes one to think of the reward as sufficient justification for doing a particular activity. It appears then to be a component of saliency.

There seems to be some doubt as to whether or not the three dollars given to each paid subject in this study was a sufficient amount for them to perceive it as important. That is, the three dollars may not have been a sufficient amount for subjects to attribute to it the major reason they were doing the puzzles. To the question asking each subject what they thought would be a fair amount to be paid for participation in future experiments of this nature, the overall mean response was \$4.85. The range of payment desired however was quite large with some subjects saying they would do it for no payment and one subject wanting as much as \$50.00. If the zero responses to this question were to be discarded on the grounds that they may reflect only the willingness of a subject to volunteer for no payment to be in the experiment, to be cooperative, to be friendly, and so on, and not the true worth of his time, the mean value for response to this question would be \$6.06. This amount is more than double that actually paid to subjects in this experiment and is probably a figure closer to what could be considered a sufficient reward for an adult. Therefore, it seems, that while the reward was most probably made conspicuous in this study, it probably was not sufficient. That is, it was not sufficient justification for adults to cognitively attribute their main reason for

doing the puzzles to the money.

It should also be noted that there is also the possibility that the low enjoyment of the task and the insufficiency of the reward may have interacted to cause the lack of results in the present study. Deci (1975c), in his recent book proposed:

that if a person engages in a dull activity (the first cognition) for insufficient extrinsic rewards (the second cognition), he will experience dissonance, which he will reduce by convincing himself that he is intrinsically motivated toward that activity. In other words, his intrinsic motivation will increase to reduce dissonance. (p.163)

He then reviewed a number of studies to support the above proposal. In the present study, it is also possible that the low enjoyment of the task and the insufficient reward interacted in some way to result in a lack of significant findings. Of course, since no differential findings were obtained, nothing else in this regard can be said.

To this point, mention has been made only of the independent variable "payment", and its effect on enjoyment. An attempt has been made to provide an explanation as to why this study has failed to replicate the findings of other research where money has been used as an external motivator. In the present study, a second independent variable, "knowledge" was also manipulated to see if it had any effect on enjoyment and to see if knowledge and payment might interact to produce an effect on enjoyment. It is now suggested that because "enjoyment" may not have been

at a high enough level in the puzzles, and the three dollar payment might not have been sufficient justification for subjects to perceive it as their reason for doing the puzzles, that a true test of the effect of this variable on intrinsic motivation did not materialize. Future designs should re-examine the knowledge variable for possible effects on intrinsic motivation.

No significant differences between males and females were evident on the main dependent variable of enjoyment. It was hypothesized that in the P conditions, females should find less enjoyment than males. In the K/NP condition it was predicted that women would experience more enjoyment than males, while in the NK/NP condition it was predicted that there would be no significant differences. Again, since the enjoyment of the puzzles seems not to have been at a high enough level in this study, and since \$3.00 may not have been sufficient for subjects to perceive this payment as an important reason for doing the puzzles, a true examination of the expected differences between males and females under these experimental conditions did not eventuate. Further research in this regard should not be discontinued on the basis of the obtained lack of results.

Other research possibilities are also suggested by the data obtained in the present study. The puzzle task for this experiment was selected on the basis that it had been used successfully by Calder and Staw (1975b) as an enjoyable activity. As has already been shown, maybe the puzzles

were not enjoyable to the subjects used in the present experiment. Calder and Staw used undergraduate males as subjects. They were thus able to include some pictures in their puzzles that are known to provide enjoyment to men, particularly at an undergraduate student level. For example, it was possible to include three centerfolds from "Playboy" magazine to achieve their end. Since a mixed group of relatively unknown adults was employed in this experiment, a similar ploy was not able to be used to ensure general high enjoyment. If adults from the general population are to be used in future studies, extensive pilot work should be carried out in order to discover what activity is enjoyable for a mixed adult group.

A second area of possible future research suggested by the data lies in what amount of money might be considered sufficient payment for an adult male or female to perceive it as the major reason they were doing an activity. This study employed adult male and female subjects from varied circumstances in life. Virtually all other research on intrinsic motivation where payment was an independent variable, has used children or university students as subjects. In those designs, amounts of up to \$1.50 seem to have been a sufficient amount for subjects to perceive themselves as doing the activity mainly for the money. The \$3.00 payment given to subjects in this experiment was arrived at by reasoning that since for students in previous research,

\$1.50 had proved a sufficient amount, then twice that amount should be sufficient for an adult. The actual fact of what is sufficient for adults however does not appear to be that simple a matter. Empirical research is required to determine what amount might be sufficient for adults when participating in this type of experiment.

REFERENCES

- Anderson, R., Manooigan, S.T., & Reznick, S., The undermining and enhancing of intrinsic motivation in preschool children. Journal of Personality and Social Psychology, 1976, 34, 915-922.
- Atkinson, J.W., An Introduction to motivation. Princeton, N.J.: van Nostrand, 1964.
- Bem, D.J., Self perception: An alternative interpretation of cognitive dissonance phenomena. Psychological Review, 1967, 74, 183-200.
- Calder, B.J. & Staw, B.M., The interaction of intrinsic and extrinsic motivation: Some methodological notes. Journal of Personality and Social Psychology, 1975, 31, 76-80. (a)
- Calder, B.J. & Staw, B.M., Self perception on intrinsic and extrinsic motivation. Journal of Personality and Social Psychology, 1975, 31, 599-604. (b)
- Caskey, S.R., Effects of motivation on standing broad jump performance in children. The Research Quarterly, 1966, 39, 54-59.
- de Charms, R., Personal causation: The internal affective determinants of behavior. New York: Academic Press, 1968.
- Deci, E.L., Effects of externally mediated rewards on intrinsic motivation. Journal of Personality and Social Psychology, 1971, 18, 105-115.
- Deci, E.L., Intrinsic motivation, extrinsic reinforcement and inequity. Journal of Personality and Social Psychology, 1972, 22, 113-120. (a)
- Deci, E.L., The effects of contingent and noncontingent rewards and controls on intrinsic motivation. Organizational Behavior and Human Performance, 1972, 8, 217-229. (b)
- Deci, E.L., Intrinsic motivation. New York: Plenum Press, 1975. (c)
- Deci, E.L., & Cascio, W.F., Change in intrinsic motivation as a function of negative feedback and threats. Unpublished manuscript, University of Rochester, 1972.

- Deci, E.L., Benware, C. & Landy, D., The attribution of motivation as a function of output and rewards. Journal of Personality, 1974, 42, 652-667.
- Deci, E.L., Cascio, W.F. & Krusell, J., Cognitive evaluation theory and some comments on the Calder and Staw critique. Journal of Personality and Social Psychology, 1975, 31, 81-85.
- Dermer, J., The interrelationship of intrinsic and extrinsic motivation. Academy of Management Journal, 1975, 18, 125-129.
- Festinger, L., A theory of cognitive dissonance. Evanston, IA: Row, Peterson, 1957.
- Freedman, J.L., Carlsmith, J.M. & Sears, D.O., Social Psychology. Prentice Hall Inc., 1970, pp.17-20
- Greenwald, A.G., On the inconclusiveness of "crucial" cognitive tests of dissonance versus self-perception theories. Journal of Experimental Social Psychology, 1975, 11, 490-499.
- Hebb, D.O., Drives and the C.N.S.(Conceptual Nervous System) Psychological Review, 1955, 62, 243-254.
- Heider, F., The psychology of interpersonal relations. New York: Wiley, 1958.
- Jones, E.E. & Davis, K.E., From acts to dispositions: The attribution process in person perception. In L. Berkowitz (Ed.), Advances in experimental social psychology, 2, New York: Academic Press, 1965.
- Jones, E.E., Kanouse, D.E., Kelley, H.H., Nisbett, R.E., Valins, S., & Weiner, B. (Eds.), Attribution: Perceiving the causes of behavior. Morristown, N.J.: General Learning Press, 1972.
- Kahoe, R.D. & McFarland, R.E., Interactions of task challenge and intrinsic and extrinsic motivations in college achievement. Journal of Educational Psychology, 1975, 67, 432-438.
- Kelley, H.H., Attribution theory in social psychology. In D. Levine (Ed.), Nebraska Symposium on Motivation. Lincoln: University of Nebraska Press, 1967.
- Kelley, H.H., Attribution in social interaction. Morristown N.J.: General Learning Press, 1971. (a)
- Kelley, H.H., Causal schematic and the attribution process. Morristown, N.J.: General Learning Press, 1971. (b)

- Kelley, H.H., The process of causal attribution. American Psychologist, 1973, 28, 107-128.
- Kruglanski, A.W., The endogenous - exogenous partition in attribution theory. Psychological Review, 1975, 82, 387-406.
- Kruglanski, A.W., Alon, S. & Lewis, T., Retrospective misattribution and task enjoyment. Journal of Experimental Social Psychology, 1972, 8, 493-501.
- Kruglanski, A.W., Friedman, I. & Zeevi, G., The effects of extrinsic incentive on some qualitative aspects of task performance. Journal of Personality, 1971, 31, 606-617.
- Kruglanski, A.W., Riter, A., Arazi, D., Agassi, R., Montequio, J., Peri, I. & Peretz, M., Effects of task - intrinsic rewards upon extrinsic and intrinsic motivation. Journal of Personality and Social Psychology, 1975, 31, 699-705.
- Kruglanski, A.W., Riter, A., Amatai, A., Margolin, B., Shabtai, L. & Zaksh, D., Can money enhance intrinsic motivation?: A test of the content - consequence hypothesis. Journal of Personality and Social Psychology, 1975, 31, 744-750.
- Latane, B., Studies in social comparison - introduction and overview. Journal of Experimental Social Psychology. Supplement 1, 1966, 1-5.
- Lepper, M.R., Greene, D. & Nisbett, R.E., Undermining children's intrinsic interest with extrinsic reward: A test of the "overjustification" hypothesis. Journal of Personality and Social Psychology, 1973, 28, 129-137.
- Marshall, S.L.A., Men against fire. New York: Morrow, 1947.
- Martens, R., Landers, D.M., Motor Performance under stress: A test of the inverted U hypothesis. Journal of Personality and Social Psychology, 1970, 16, 29-37.
- Morse, S., Gergen, K.J., Social comparison, self consistency, and the concept of self. Journal of Personality and Social Psychology, 1970, 16, 148-156.
- Notz, W.W., Work motivation and the negative effects of extrinsic rewards: A review with implications for theory and practice. American Psychologist, September, 1975, 884-891.
- Porter, L.W., & Lawler, E.E., Managerial attitudes and performance. Homewood, Illinois: Irwin-Dorsey, 1968.

- Ross, M., Salience of reward and intrinsic motivation. Journal of Personality and Social Psychology, 1975, 32, 245-254.
- Reiss, S. & Sushinsky, L.W., Overjustification, competing responses, and the acquisition of intrinsic interest. Journal of Personality and Social Psychology, 1975, 31, 1116-11125.
- Skinner, B.F., Science and human behavior. New York: Free Press, 1953.
- Skinner, B.F., Operant Behavior, in Operant Behavior: Areas of Research and Application. W.K. Honig (Ed.) New York: Appleton-Century-Crofts, 1966.
- Skinner, B.F., Contingencies of reinforcement. New York: Appleton-Century-Crofts, 1969.
- Staw, B.M. Attitudinal and behavioral consequences of changing a major organizational reward: A natural field experiment. Journal of Personality and Social Psychology, 1974, 29, 742-751.
- Tyhurst, J.S., Individual reactions to community disaster: the natural history of psychiatric phenomena. American Journal of Psychiatry, 1951, 107, 764-769.
- Vroom, V.H., Work and Motivation. New York: Wiley, 1964.
- Weick, K.E., Reduction of cognitive dissonance through task enhancement and effort expenditure. Journal of Abnormal and Social Psychology, 1964, 68, 533-539.

LIST OF APPENDICES

	Page
A Questionnaire	40
B Puzzle recording form	44
C 2 x 2 x 2 randomized factorial between-groups ANOVA	
Question 1	45
Question 2	46
Question 3	47
Question 4	48
Question 5	49
Question 6	50
Question 7	51
Question 8	52
Question 9	53
Question 10	54
Question 11	55
Question 12	56
Question 13	57
Question 14	58
Question 15	59
Time taken to complete the puzzles	60

APPENDIX A

NAME: _____

PLEASE READ THE FOLLOWING QUESTIONS CAREFULLY. ANSWER THEM FROM THE UNDERSTANDING YOU RECEIVED AT TONIGHTS BRIEFING IN THE FIRST ROOM. CIRCLE THE NUMBER MOST APPROPRIATE TO YOUR FEELINGS.

1. How fast did you think you were working on the puzzles?

-4	-3	-2	-1	0	+1	+2	+3	+4
very, very, slowly	very slowly	slowly	slightly slowly	neither slowly nor quickly	slightly quickly	quickly	very quickly	very, very, quickly

2. While doing the puzzles, how involved did you feel?

-4	-3	-2	-1	0	+1	+2	+3	+4
very, very, uninvolved	very uninvolved	uninvolved	slightly uninvolved	neither uninvolved nor involved	slightly involved	involved	very involved	very, very, involved

3. How enjoyable did you find the task?

-4	-3	-2	-1	0	+1	+2	+3	+4
very, very, unenjoyable	very unenjoyable	unenjoyable	slightly unenjoyable	neither unenjoyable nor enjoyable	slightly enjoyable	enjoyable	very enjoyable	very, very, enjoyable

4. How difficult did you find the puzzles to be?

-4	-3	-2	-1	0	+1	+2	+3	+4
very, very, easy	very easy	easy	slightly easy	neither easy nor difficult	slightly difficult	difficult	very difficult	very, very, difficult

NAME _____

Thinking about all the things we have to do in life, most of the tasks we do are done because we want to, or for some other reason. For example, we may watch T.V., go skiing, or have a snack just because we want to. On the other hand, we may work at a job because we need money, shovel snow because we have to get our car out, or volunteer for committee work because someone asked us. Considering these points, to the best of your ability, answer the following question.

If you were to participate in a similar experiment again, to what degree would you be doing it?

5. Because you wanted to:

0	1	2	3	4
not at all	a little bit	to a mod- erate degree	quite a bit	to a great degree

6. For other reasons:

0	1	2	3	4
not at all	a little bit	to a mod- erate degree	quite a bit	to a great degree

7. To what degree did you perceive the puzzles to be work?

0	1	2	3	4
not at all	a little bit	to a mod- erate degree	quite a bit	to a great degree

8. To what degree did you feel you were under pressure to work quickly?

0	1	2	3	4
not at all	a little bit	to a mod- erate degree	quite a bit	to a great degree

9. After the instructions were read to you tonight, to what degree did you know that people in other groups will not be paid to do the same puzzles?

0	1	2	3	4
not at all	a little bit	to a mod- erate degree	quite a bit	to a great degree

NAME: _____

10. To what degree did you perceive doing the puzzles to be play?

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
not at all	a little bit	to a mod- erate degree	quite a bit	to a great degree

11. After the instructions were read to you tonight, to what degree did you know that people in other groups will be paid to do the same puzzles?

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
not at all	a little bit	to a mod- erate degree	quite a bit	to a great degree

12. While you were doing the puzzles, to what degree were you aware you were going to be paid for doing them?

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
not at all	a little bit	to a mod- erate degree	quite a bit	to a great degree

13. If you were to be paid for future participation in research such as you have just done, write down what you think would be a fair amount of money to be given for taking part.

14. Even though it was decided who were or were not to be paid by drawing names from a hat, how did you feel when you found you were/were not to be paid for doing the puzzles and others were?

<u>-4</u>	<u>-3</u>	<u>-2</u>	<u>-1</u>	<u>0</u>	<u>+1</u>	<u>+2</u>	<u>+3</u>	<u>+4</u>
very, very, dis- atis- fied	very dis- atis- fied	dis- atis- fied	slightly disatis- fied	neither disatis- fied nor satisfied	slightly satis- fied	satis- fied	very satis- fied	very, very, satis- fied

This question was asked only of the knowledge conditions.

NAME: _____

15. How satisfactory did you feel the payment you received for doing the puzzles to be?

-4	-3	-2	-1	0	+1	+2	+3	+4
very, very, under- paid	very under- paid	under- paid	slightly under- paid	neither under- paid nor overpaid	slightly over- paid	over- paid	very over- paid	very, very, over- paid

This question was asked only of the pay conditions.

APPENDIX B

NAME: _____

Puzzle symbol	Practice Order of pick up	<u>Puzzle Numbers</u>									
		1	2	3	4	5	6	7	8	9	10

A _____
B _____
C _____
D _____
E _____

11 12 13 14 15 _____

A _____
B _____
C _____
D _____
E _____

APPENDIX C

Question 1

How fast did you think you were working on the puzzles?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	0.777	3	0.233	0.134	(NS)
K	0.450	1	0.450	0.258	(NS)
P	0.200	1	0.200	0.114	(NS)
S	0.050	1	0.500	0.029	(NS)
<u>2 Factor interactions</u>	1.050	3	0.350	0.200	(NS)
K * P	0.200	1	0.200	0.114	(NS)
K * S	0.050	1	0.050	0.029	(NS)
P * S	0.800	1	0.800	0.458	(NS)
<u>3 Factor interaction</u>	0.000	1	0.000	0.000	(NS)
K * P * S	0.000	1	0.000	0.000	(NS)
Explained	1.750	7	0.250	0.143	(NS)
Residual	125.799	72	1.747		
Total	127.549	79	1.615		

* p<.05

** p<.01

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	0.70	0.80	0.70	0.90	1.10	0.90	0.90	0.60
SD	1.06	1.69	1.06	1.29	1.29	0.74	1.10	1.95

Question 2

While doing the puzzles, how involved did you feel?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	4.037	3	1.346	1.204	(NS)
K	3.612	1	3.612	3.231	(NS)
P	0.312	1	0.312	0.280	(NS)
S	0.112	1	0.112	0.101	(NS)
<u>2 Factor interactions</u>	1.238	3	0.413	0.369	(NS)
K * P	0.612	1	0.612	0.548	(NS)
K * S	0.312	1	0.312	0.280	(NS)
P * S	0.312	1	0.312	0.280	(NS)
<u>3 Factor Interaction</u>	3.613	1	3.613	3.231	(NS)
K * P * S	3.612	1	3.612	3.231	(NS)
Explained	8.888	7	1.270	1.136	(NS)
Residual	80.499	72	1.118		
Total	89.387	79	1.131		

* $p < .05$
 ** $p < .01$

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	2.10	1.60	1.30	1.90	1.80	1.30	2.10	2.20
SD	0.99	1.35	1.34	0.99	0.92	1.25	0.74	0.63

Question 3

How enjoyable did you find solving the puzzles?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	1.437	3	0.479	0.407	(NS)
K	0.112	1	0.112	0.096	(NS)
P	0.312	1	0.312	0.266	(NS)
S	1.012	1	1.012	0.861	(NS)
<u>2 Factor interactions</u>	0.738	3	0.246	0.209	(NS)
K * P	0.312	1	0.312	0.266	(NS)
K * S	0.312	1	0.312	0.266	(NS)
P * S	0.112	1	0.112	0.096	(NS)
<u>3 Factor interaction</u>	0.313	1	0.313	0.266	(NS)
K * P * S	0.313	1	0.313	0.266	(NS)
Explained	2.488	7	0.355	0.302	(NS)
Residual	84.700	72	1.176		
Total	87.187	79	1.104		

* $p < .05$ ** $p < .01$

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	1.80	1.40	1.60	1.70	1.80	1.50	2.00	1.70
SD	1.48	1.51	0.84	0.95	0.63	0.85	0.67	1.34

Question 4

How difficult did you find the puzzles to be?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	4.300	3	1.433	0.826	(NS)
K	0.050	1	0.050	0.029	(NS)
P	4.050	1	4.050	2.333	(NS)
S	0.200	1	0.200	0.115	(NS)
<u>2 Factor interactions</u>	5.050	3	1.683	0.970	(NS)
K * P	4.050	1	4.050	2.333	(NS)
K * S	0.800	1	0.800	0.461	(NS)
P * S	0.200	1	0.200	0.115	(NS)
<u>3 Factor interaction</u>	7.200	1	7.200	4.147	0.04
K * P * S	7.200	1	7.200	4.147	0.04*
Explained	16.550	7	2.364	1.362	(NS)
Residual	124.999	72	1.736		
Total	141.549	79	1.792		

* p<.05

** p<.01

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	-2.8	-2.0	-2.2	-2.4	-3.0	-2.8	-2.1	-2.7
SD	1.03	1.56	1.69	0.97	1.05	1.32	0.88	0.67

Question 5

If you were to participate in a similar experiment again, to what degree would you be doing it because you wanted to?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	2.450	3	0.817	0.733	(NS)
K	1.800	1	1.800	1.616	(NS)
P	0.450	1	0.450	0.404	(NS)
S	0.200	1	0.200	0.180	(NS)
<u>2 Factor interactions</u>	1.300	3	0.433	0.389	(NS)
K * P	0.450	1	0.450	0.404	(NS)
K * S	0.800	1	0.800	0.718	(NS)
P * S	0.050	1	0.050	0.045	(NS)
<u>3 Factor interaction</u>	6.050	1	6.050	5.431	0.02
K * P * S	6.050	1	6.050	5.431	0.02*
Explained	9.800	7	1.400	1.257	(NS)
Residual	80.199	72	1.114		
Total	89.999	79	1.139		

* $p < .05$

** $p < .01$

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	3.00	2.60	2.20	2.50	2.80	1.90	2.20	2.80
SD	0.82	0.84	0.79	0.85	0.79	1.60	1.32	1.14

Question 6

If you were to participate in a similar experiment again, to what degree would you be doing it for other reasons?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	6.737	3	2.246	1.574	(NS)
K	6.612	1	6.612	4.636	0.03*
P	0.112	1	0.112	0.079	(NS)
S	0.012	1	0.012	0.009	(NS)
<u>2 Factor interactions</u>	1.038	3	0.346	0.242	(NS)
K * P	0.312	1	0.312	0.219	(NS)
K * S	0.612	1	0.612	0.429	(NS)
P * S	0.112	1	0.112	0.079	(NS)
<u>3 Factor interaction</u>	0.012	1	0.012	0.009	(NS)
K * P * S	0.012	1	0.012	0.009	(NS)
Explained	7.788	7	1.113	0.780	(NS)
Residual	102.699	72	1.426		
Total	110.487	79	1.399		

* $p < .05$

** $p < .01$

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	2.00	1.80	1.40	1.50	1.10	1.40	2.20	2.80
SD	1.33	0.92	1.07	1.35	0.74	1.58	1.03	1.10

Question 7

To what degree did you perceive the puzzles to be work?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	0.900	3	0.300	0.651	(NS)
K	0.000	1	0.000	0.000	(NS)
P	0.450	1	0.450	0.976	(NS)
S	0.450	1	0.450	0.976	(NS)
<u>2 Factor interactions</u>	1.650	3	0.550	1.193	(NS)
K * P	0.800	1	0.800	1.735	(NS)
K * S	0.800	1	0.800	1.735	(NS)
P * S	0.050	1	0.050	0.108	(NS)
<u>3 Factor interaction</u>	1.800	1	1.800	3.904	0.05
K * P * S	1.800	1	1.800	3.904	0.05*
Explained	4.350	7	0.621	1.348	(NS)
Residual	33.200	72	0.461		
Total	37.550	79	0.475		

* $p < .05$

** $p < .01$

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	0.20	0.60	0.90	0.30	0.30	0.42	0.60	0.30
SD	0.42	0.84	0.74	0.30	0.67	0.42	0.97	0.48

Question 8

To what degree did you feel you were under pressure to work quickly?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	0.700	3	0.233	0.221	(NS)
K	0.200	1	0.200	0.189	(NS)
P	0.450	1	0.450	0.426	(NS)
S	0.050	1	0.050	0.047	(NS)
<u>2 Factor interactions</u>	0.250	3	0.083	0.079	(NS)
K * P	0.000	1	0.000	0.000	(NS)
K * S	0.200	1	0.200	0.189	(NS)
P * S	0.050	1	0.050	0.047	(NS)
<u>3 Factor interaction</u>	1.800	1	1.800	1.705	(NS)
K * P * S	1.800	1	1.800	1.705	(NS)
Explained	2.750	7	0.393	0.372	(NS)
Residual	76.000	72	1.056		
Total	78.750	79	0.997		

* $p < .05$

** $p < .01$

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	1.40	1.10	0.90	1.40	1.10	0.90	1.00	0.90
SD	1.26	0.88	0.88	1.17	0.99	0.99	0.67	1.10

Question 9

After the instructions were read to you tonight, to what degree did you know that people in other groups will not be paid to do the same puzzles?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	88.537	3	29.512	14.007	0.001
K	82.012	1	82.012	38.925	0.001**
P	5.512	1	5.512	2.616	(NS)
S	1.012	1	1.012	0.481	(NS)
<u>2 Factor interactions</u>	1.637	3	0.546	0.259	(NS)
K * P	0.312	1	0.312	0.148	(NS)
K * S	1.012	1	1.012	0.481	(NS)
P * S	0.312	1	0.312	0.148	(NS)
<u>3 Factor interaction</u>	0.613	1	0.613	0.291	(NS)
K * P * S	0.612	1	0.612	0.291	(NS)
Explained	90.787	7	12.970	6.156	0.001
Residual	151.699	72	2.107		
Total	242.487	79	3.069		

* $p < .05$

** $p < .01$

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	2.90	2.50	0.00	0.30	0.70	0.40	2.90	2.50
SD	1.49	1.81	0.00	0.95	1.49	1.26	1.79	1.84

Question 10

To what degree did you perceive the puzzles to be play?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	5.837	3	1.946	1.140	(NS)
K	0.312	1	0.312	0.183	(NS)
P	5.512	1	5.512	3.229	(NS)
S	0.012	1	0.012	0.007	(NS)
<u>2 Factor interaction</u>	3.938	3	1.313	0.769	(NS)
K * P	1.012	1	1.012	0.593	(NS)
K * S	0.112	1	0.112	0.066	(NS)
P * S	2.813	1	2.813	1.648	(NS)
<u>3 Factor interaction</u>	7.812	1	7.812	4.577	0.03
K * P * S	7.812	1	7.812	4.577	0.03*
Explained	17 587	7	2.512	1.472	0.190
Residual	122.900	72	1.707		
Total	140 487	79	1.778		

* p<.05

** p<.01

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	2.10	1.00	1.30	1.60	2.30	2.10	1.40	2.30
SD	1.52	1.33	1.06	1.17	1.06	1.29	1.35	1.57

Question 11

After the instructions were read to you tonight, to what degree did you know that people in other groups will be paid to do the same puzzles?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	65.237	3	21.746	12.280	0.001
K	63.012	1	63.012	35.584	0.001**
P	2.112	1	2.112	1.193	(NS)
S	0.112	1	0.112	0.064	(NS)
<u>2 Factor interactions</u>	20.637	3	6.879	3.885	0.01
K * P	19.012	1	19.012	10.737	0.002*
K * S	1.012	1	1.012	0.572	(NS)
P * S	0.612	1	0.612	0.612	(NS)
<u>3 Factor interaction</u>	0.013	1	0.013	0.007	(NS)
K * P * S	0.012	1	0.012	0.007	(NS)
Explained	85.887	7	12.270	6.929	0.001
Residual	127.500	72	1.771		
Total	213.387	79	2.701		

* $p < .05$

** $p < .01$

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	1.50	1.40	0.50	0.80	0.00	0.00	3.00	2.50
SD	1.43	1.58	1.08	1.69	0.00	0.00	1.49	1.84

Question 12

While you were doing the puzzles, to what degree were you aware you were going to be paid for doing them?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	60.850	3	20.283	10.915	0.001
K	1.250	1	1.250	0.673	(NS)
P	57.800	1	57.800	31.103	0.001**
S	1.800	1	1,800	0.969	(NS)
<u>2 Factor interactions</u>	4.850	3	1.617	0.870	(NS)
K * P	1.800	1	1.800	0.969	(NS)
K * S	1.800	1	1.800	0.969	(NS)
P * S	1.250	1	1.250	0.673	(NS)
<u>3 Factor interaction</u>	1.250	1	1.250	0.673	(NS)
K * P * S	1.250	1	1.250	0.673	(NS)
Explained	66.950	7	9.564	5.147	0.001
Residual	133.800	72	1.858		
Total	200.750	79	2.541		

* $p < .05$

** $p < .01$

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	0.90	2.00	2.00	2.00	0.00	0.00	0.70	0.80
SD	1.52	2.11	1.89	2.11	0.00	0.00	1.49	1.40

Question 13

If you were to be paid for future participation in research such as you have just done, write down what you think would be a fair amount of money to be given for taking part.

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	156.218	3	52.072	1.005	(NS)
K	143.540	1	143.540	2.771	(NS)
P	10.804	1	10.804	0.209	(NS)
S	1.873	1	1.873	0.036	(NS)
<u>2 Factor interactions</u>	29.347	3	9.782	0.189	(NS)
K * P	21.424	1	21.424	0.414	(NS)
K * S	1.873	1	1.873	0.036	(NS)
P * S	6.050	1	6.050	0.117	(NS)
<u>3 Factor interaction</u>	101.249	1	101.249	1.955	(NS)
K * P * S	101.249	1	101.249	1.955	(NS)
Explained	286.814	7	40.973	0.791	(NS)
Residual	3729.768	72	51.795		
Total	4016.082	79	50.836		

* $p < .05$ ** $p < .01$

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	2.55	4.25	7.50	3.34	5.72	8.79	4.39	2.25
SD	3.11	4.21	15.98	4.89	4.00	9.11	4.39	2.15

Question 14

Even though it was decided who were or were not to be paid by drawing names from a hat, how did you feel when you found you were/were not to be paid for doing the puzzles and others were?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	0.200	2	0.100	0.061	(NS)
P	0.100	1	0.100	0.061	(NS)
S	0.100	1	0.100	0.061	(NS)
<u>2 Factor interaction</u>	0.400	1	0.400	0.244	(NS)
P * S	0.400	1	0.400	0.244	(NS)
<u>Explained</u>	0.600	3	0.200	0.122	(NS)
<u>Residual</u>	59.000	36	1.639		
<u>Total</u>	59.600	39	1.528		

* $p < .05$

** $p < .01$

	K/P		K/NP	
	F	M	F	M
X	0.80	0.10	0.70	0.80
SD	1.03	1.73	1.49	1.40

Question 15

How satisfactory did you feel the payment you received for doing the puzzles to be?

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	92480.625	2	46240.313	6.808	0.003
K	90155.000	1	90155.000	13.273	0.001**
S	2325.625	1	2325.625	0.342	(NS)
<u>2 Factor interaction</u>	2235.000	1	2235.000	0.329	(NS)
K * S	2235.025	1	2235.025	0.329	(NS)
Explained	94715.625	3	31571.875	4.648	0.008
Residual	244527.688	36	6792.434		
Total	339243.313	39	8698.543		

* $p < .05$

** $p < .01$

	K/P		NK/P	
	F	M	F	M
X	1.00	1.40	1.60	2.10
SD	1.76	2.32	2.41	1.52

Time taken to complete the puzzles.

<u>Source of variation</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Square</u>	<u>F</u>	
<u>Main effects</u>	22.746	3	7.492	0.661	(NS)
K	0.181	1	0.181	0.016	(NS)
P	13.449	1	13.449	1.186	(NS)
S	8.846	1	8.846	0.780	(NS)
<u>2 Factor interactions</u>	26.826	3	8.943	0.789	(NS)
K * P	0.113	1	0.113	0.010	(NS)
K * S	0.032	1	0.032	0.001	(NS)
P * S	26.681	1	26.681	2.354	(NS)
<u>3 Factor interaction</u>	0.723	1	0.723	0.064	(NS)
K * P * S	0.723	1	0.723	0.064	(NS)
Explained	50.025	7	7.146	0.630	(NS)
Residual	816.181	72	11.336		
Total	866.205	79			

* p<.05

** p<.01

	K/P		NK/P		NK/NP		K/NP	
	F	M	F	M	F	M	F	M
X	12.99	14.58	12.59	14.64	13.19	12.55	13.06	12.72
SD	2.57	5.64	3.14	4.64	2.21	1.74	1.64	3.21