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INTRINSIC AND EXTRINSIC MOTIVATION

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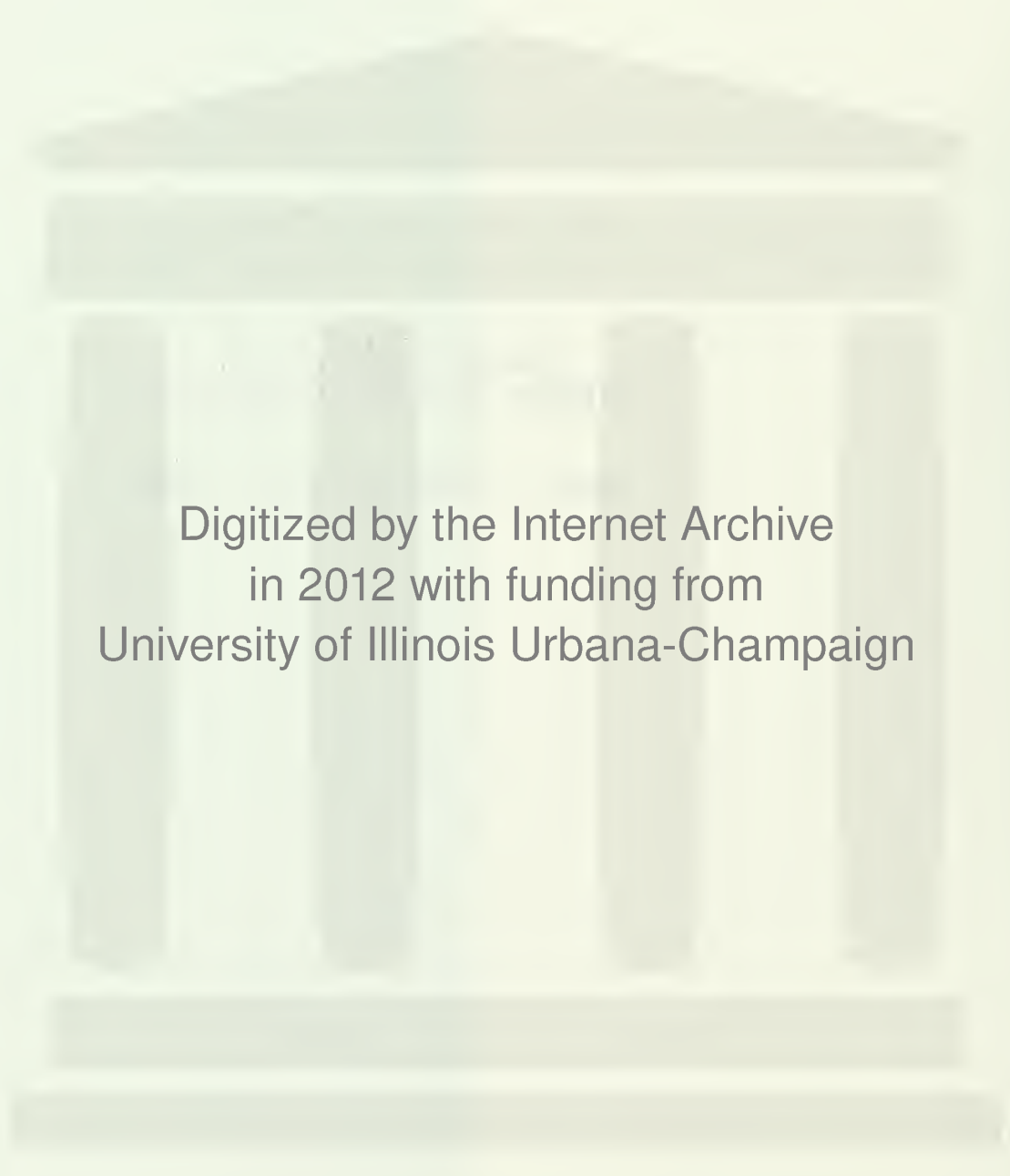
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Abstract

Self-perception theory predicts that intrinsic and extrinsic motivation do not combine additively but rather interact. To test this predicted interaction, intrinsic and extrinsic motivation were both manipulated as independent variables. The results revealed a significant interaction for task satisfaction and a trend for the interaction on a behavioral measure. These results are discussed in terms of a general approach to the self-perception of motivation.

The Self-Perception of Intrinsic and Extrinsic Motivation

Research on motivation has frequently drawn a distinction between intrinsic and extrinsic motivation (e.g., Atkinson, 1964; Hunt, 1965; Koch, 1956; Young, 1961). If a situation contains a specific goal which provides satisfaction independent of the actual activity itself, behavior is said to be extrinsically motivated. On the other hand, if the activity is valued for its own sake and appears to be self-sustained, behavior is said to be intrinsically motivated (Young, 1961, p. 171). Although this distinction is conceptually appealing, it raises difficult questions. There are two major problems confronting the account of any behavior in terms of intrinsic and extrinsic motivation (Cofer and Appley, 1967). The most serious is that the phenomenon is merely named, not explained. Labeling a behavior as intrinsically motivated begs the question of the theoretical nature of the process through which the behavior has become a motive. The second problem is that there are other theories which might plausibly explain the phenomenon. No doubt the most common alternative explanation involves secondary reinforcement. Secondary reinforcement refers to a process by which an originally neutral stimulus acquires reinforcing properties through its association with a primary reinforcer. In these terms, an intrinsically motivated activity is simply one in which the reinforcement value of the goal has associatively rubbed off on the behavior itself. Thus, it is difficult to use the notion of intrinsic motivation beyond the descriptive level.

Although the status of intrinsic motivation as a psychological construct is unclear, we would argue that the concept is of

considerable interest from still another perspective. Instead of asking what intrinsic motivation is and how it operates, it may be viewed as a perception on the part of individuals. That is, suppose that individuals attempt to label their behavior in motivational terms much as do motivational theorists. The seeds of such an approach have been developed by de Charms (1968) as part of his work on personal causation as an affective determinant of behavior. de Charms argues as follows:

As a first approximation, we propose that whenever a person experiences himself to be the locus of causality for his own behavior (to be an Origin), he will consider himself to be intrinsically motivated. Conversely, when a person perceives the locus of causality for his behavior to be external to himself (that he is a Pawn), he will consider himself to be extrinsically motivated [1968, p. 328].

For de Charms, the crux of the distinction between intrinsic and extrinsic motivation stems from the feeling or perception of personal causation. Satisfaction derives from an activity which is perceived as intrinsically motivated because of our need to feel a sense of personal causation in our actions.

de Charm's ideas may be readily extended to a more general approach to intrinsic motivation by means of Bem's (1967a, 1967b, 1970, 1972) self-perception theory. According to this theory, a person infers his internal states by observing his own behavior and the context in which it occurs. Thus a person may label his behavior as intrinsically motivated under some conditions and as extrinsically motivated under others. The environment provides cues as to whether one's internal motivation is intrinsic or extrinsic.

de Charms' (1968) discussion of intrinsic motivation poses an interesting question. Common sense would lead one to expect that intrinsic and extrinsic motivation summate to produce satisfaction, and most organizational theories of job attitudes have made this assumption (e.g., Porter and Lawler, 1968; Vroom, 1964). However, de Charms argues that intrinsic and extrinsic motivation interact. Specifically, the introduction of extrinsic rewards for a behavior may decrease motivation rather than enhance it, because the rewards decrease the perception of intrinsic motivation. He also predicts, conversely, that motivation may be enhanced if a reward is withheld.

Several recent studies have tended to support the hypothesis that intrinsic and extrinsic motivation are not additive. Deci (1971) found that the introduction of contingent monetary rewards for an interesting puzzle solving task apparently decreased subjects' subsequent desire to work on the puzzles, while a noncontingent monetary reward did not (1972b). Calder and Staw (in press), however, have pointed out a number of methodological problems that render this work very difficult to interpret. Three other studies provide firmer evidence. Lepper, Greene, and Nisbett (1973) demonstrated that children who expected a reward for an interesting task, playing with magic markers, subsequently played with the markers in a free-time situation less than subjects who did not expect the reward or who received no reward. Kruglanski, Friedman, and Zeevi (1971) showed that children who received an extrinsic reward rated the experimental task as less enjoyable and were less likely to volunteer for similar experiments. Finally, Ross (1973) found that preschool children given a salient contingent reward displayed less interest in a target activity than subjects in a nonsalient reward or a control condition.

All of the previous studies of the interaction of intrinsic and extrinsic motivation have utilized the same experimental design: An extrinsic reward is introduced to an interesting task and some dependent variable measure of intrinsic motivation is assessed. The purpose of the present study is to test this interaction hypothesis more directly by manipulating both intrinsic and extrinsic factors as independent variables and measuring their effects on relevant dependent variables. Task satisfaction and a behavioral measure of task persistence are employed as dependent variables in the present study because of their obvious practical importance, their use in other studies, and their relevance to the interaction prediction.

Since both intrinsic and extrinsic factors are manipulated independent variables in this design, one can clearly test the assumption of additivity versus the interaction of intrinsic and extrinsic motivation. Theoretically, the interaction prediction may be derived as follows. When a task involves high intrinsic interest, introduction of extrinsic rewards may lead to the self-perception that one is performing the activity primarily to obtain the extrinsic reward. Thus, for an intrinsically interesting task, extrinsic rewards may lead to a decrease in satisfaction and persistence on a task. On the other hand, when a task involves less intrinsic interest, the self-perception effect is not expected to apply. One would expect, for a task not high in intrinsic interest, a direct (or reinforcement) relationship between extrinsic rewards and task satisfaction and persistence. Although it is not made explicit in the work of de Charms, the interaction hypothesis may thus be predicated upon two effects: an inverse (or self-perception) effect when a task is initially high in intrinsic interest, and a direct (or reinforcement) effect when there initially is less interest in a task.²

Preliminary Experiment

The design of this study calls then for varying intrinsic as well as extrinsic motivation. As suggested by our earlier discussion, manipulating intrinsic motivation reduces to finding a task which may be readily labeled as inherently pleasurable in one instance but not in another. Moreover, for our purposes this difference must not be confounded with other factors which could lead to alternative explanations. Two such factors are crucial. The task should always consist of the same overt behavior and subjects' perceptions of the task should differ primarily on an affective dimension as opposed to a cognitive or behavioral dimension. To operationalize such a manipulation, considerable pilot testing was necessary.

The basic experimental task consisted of solving 15 jig-saw type puzzles. The manipulation of intrinsic motivation was accomplished by having the puzzles blank for one group of subjects versus having interesting pictures on the puzzles of another group. Fifteen pictures were carefully selected from back issues of magazines (chiefly Life), mounted on a large piece of poster board, and laminated. There was considerable variety in the content of the pictures, ranging from sporting events to the President, and they all involved some unique point of interest. (To ensure high general interest for all subjects, it was found necessary to include three Playboy centerfolds). All pictures were mounted on the same size board and cut into five pieces to form picture puzzles. Each blank board was cut in exactly the same way as a corresponding picture board. The blank and picture puzzles were thus matched except for the picture.

Overt behavior on the task was equated through the experimental procedure. Each puzzle, whether it contained a picture or was blank, contained only five large pieces. However, the simplicity of the puzzles were not sufficient to eliminate differences in performance across groups or subjects. Hence, subjects were given a board with each puzzle which contained an outline of the parts of the puzzle, and to solve each puzzle subjects only had to pick up a piece and place it over the corresponding outlined shape. The task was presented as a test of "cognitive information-processing" in which the researchers were interested in the order in which the puzzle parts were selected. Subjects recorded this order by writing down the symbol appearing on each puzzle piece as they placed them on the pattern board. Thus, solving the puzzles was extremely routine. There was no possibility of making an error, so the extra cues provided by the picture made no difference in performance. Subjects were literally forced into the same pattern of actions by the requirements of the task.

Although this procedure controls for any differences in overt behavior between the blank and picture puzzles, it is still possible that subjects might perceive unintended differences between the two. To check on this possibility, fifteen subjects were run on each puzzle type and then given a series of semantic differential scales regarding the task. An attempt was made to include cognitive, behavioral, and affective scales. The mean ratings for the blank and picture puzzles are presented in Table 1. The only significant differences for the

Insert Table 1 about here

two groups are on the more affective scales connoting intrinsic motivation. The picture task is rated as significantly more interesting, good, exciting, and pleasurable. It is, of course, impossible to prove that there are no unintended differences in overt behavior or perceptions, but our blank vs. picture manipulation would seem to minimize this possibility.

Method

Procedure

The subjects were 40 undergraduate males fulfilling a requirement for an introductory course in organizational behavior. Ten subjects were assigned randomly to four experimental conditions. Half the subjects worked on the blank puzzles while the other half worked on the picture puzzles. For half the subjects, payment was never mentioned while the other half were told that, since the task would take about 20 to 30 minutes, an equitable payment for their time would be \$1.00. The experimental task itself was the same as for the preliminary study. The 15 disassembled puzzles and their corresponding pattern boards were placed on rows of tables in a long room as if to form an assembly line. A one dollar bill was placed at the end of the room after the fifteenth puzzle. In order to make sure this reward was salient (Ross, 1973, personal communication), before the subject began, the experimenter pointed to the money and said, "When you finish, you can have the dollar over there." The experimenter then left the room, returning when the subject finished the puzzles. To summarize, it should be noted that the reward was equitable, salient, expected, noncontingent, and given at the end of the task.³

Dependent Variables

The major dependent variable was task satisfaction. When a subject finished, he was told that the experimenter needed "to get some information about people's reactions to the task" in order to see if this affected the sequencing of puzzle parts. Subjects rated the extent to which they found the "puzzle task itself" enjoyable on a 17-point scale ranging from extremely unenjoyable to extremely enjoyable. Several other questions on 11-point scales concerned subjects' perception of the situation.

It was also desired to obtain a behavioral measure of motivation. Since the procedure did not lend itself to the typical free-time measure (Deci, 1971, 1972a, b; Lepper, et al., 1973), subjects were asked to volunteer for future experiments of a similar nature without payment. The amount of time subjects volunteered for was coded in minutes.

Results

A least-squares analysis of variance of subjects' ratings of how enjoyable they found the task revealed a significant blank-picture by money interaction (see Table 2). As predicted by the self-perception hypothesis, the manipulations of intrinsic and extrinsic motivation were not additive in their effect on task satisfaction. The form of this interaction is displayed in Figure 1. For the low intrinsically motivating blank puzzle task, the enjoyable ratings increase with the introduction of the extrinsic monetary reward. However, for the high intrinsically motivating picture puzzle task, the enjoyable ratings decrease.

 Insert Table 2 and Figure 1 about here

The mean amounts of time subjects volunteered for future experiments of a similar nature are given in Table 3. The pattern of these means exactly parallels those of the enjoyable ratings, although the interaction in the analysis of variance (see Table 2) is not significant by conventional standards. This trend suggests that the effects of intrinsic and extrinsic motivation were not additive for the behavioral measure either. It should be noted that this measure may have been weakened by the fact that the experiment occurred near the end of the semester. This factor may have increased individual variability in subjects' willingness to volunteer.

Insert Table 3 about here

The remaining dependent variables concern subjects' perceptions of various aspects of the experimental situation. One question asked whether the puzzle task was more like work or leisure-time activity. As shown in Table 3, the means for this variable increase for the blank puzzle and decrease for the picture puzzle with the introduction of money. This is the same pattern shown by the enjoyable ratings except that the blank puzzle is always more work-like than the picture puzzle. This pattern is reflected in Table 2 by the significant blank-picture main effect as well as the significant interaction.

Subjects were also asked about perceived effort, the extent to which they "tried" to do well on the puzzle task. Somewhat inexplicably the payment of money decreased the perception of trying on both the blank and picture task as indicated by the significant main effect for money in Table 2. Two other questions asked to what extent the subject perceived that he was motivated by "external factors (like course credit, the researcher, etc.)" and to what extent the subject perceived

he was motivated by his own "intrinsic interest in the puzzle task itself." As revealed in Table 2, the only significant result was a blank-picture main effect for extrinsic motivation. Subjects in the blank puzzle task always saw themselves as more externally motivated. This finding suggests that subjects may have been more aware of the effects of external factors on their level of motivation than intrinsic factors. Other questions concerned how well the subject thought he performed, beliefs about the researcher's opinion of the task and, in the payment condition, how valuable the payment was and whether it was more a bribe or a reward. These questions revealed no significant effects.

Discussion

As predicted, an interaction was found between intrinsic and extrinsic motivation for the task satisfaction variable. There was also a trend for this interaction on the behavioroid measure of volunteering. Although subjects' perceptions of their motivation as extrinsic or intrinsic did not indicate that they were aware of this effect, their ratings of whether the task was more like work or leisure-time activity did display an interaction between intrinsic and extrinsic motivation. It should also be noted that the form of the interaction for task satisfaction in Figure 1 is stronger than theoretically required. The picture puzzle actually became less enjoyable than the blank puzzle with the introduction of money.

While the present results demonstrate the interaction of intrinsic and extrinsic motivation, it is not clear to us that such an interaction need always be obtained. A more prudent hypothesis might be that under some conditions self-perception may produce an interaction between intrinsic and extrinsic motivation. Consider a description by Woodworth (1918) of the phenomenon of intrinsic motivation.

. . .while a man may enter a certain line of business from a purely external economic motive, he develops an interest in the business for its own sake. . . and the motive force that drives him in the daily task, provided of course this does not degenerate into mere automatic routine, is precisely an interest in the problems confronting him and in the processes by which he is able to deal with those problems. The end furnishes the motive force for the search for means but once the means are found, they are apt to become interesting on their own account [italics added, p. 104].

Taking a lead from Woodworth, a convenient way of viewing the self-perception process is to assume that an individual performs an intuitive means-ends analysis of his behavior. As shown in Figure 2,

 Insert Figure 2 about here

different self-perceptions may result according to the affect associated with the means and the ends of an action. Intrinsic motivation can be attributed most clearly when the means are positive and the ends are negative or neutral. Extrinsic motivation can be attributed when the means are negative or neutral and the ends are positive. When both are positive, the attribution may be unstable.

In the present experiment, the attributional instability of the picture-money combination was apparently resolved by a decrease in intrinsic motivation, producing the interaction effect. This effect, however, may well depend on two classes of variables, (1) parameters of the task environment itself and (2) other variables which were held constant in this study. In terms of task parameters, previous studies by Lepper, Greene, and Nisbett (1973) and Ross (1973) have already provided boundary conditions for the decrease in intrinsic motivation with the introduction of a reward. The reward must be

salient and expected. These are boundary conditions in the sense that any stimulus should in general have less effect on self-perception to the extent that it is non-salient and unexpected. There are parameters of even greater theoretical interest. For example, Deci (1971, 1972a, b) has suggested that non-contingent and verbal rewards do not produce the interaction effect, but the evidence for this proposition is most ambiguous (cf. Calder and Staw, in press). Other properties of rewards are almost certain to be important though. Extremely large rewards may become disassociated from the task or simply outweigh other factors. It ought not to be assumed that the interaction is linear by linear just because we tend to conduct two level experiments. Along the same lines, it should be noted that the blank puzzle task was designed so as not to be extremely negative (see Table 1). It is known that increased satisfaction can result when an individual chooses to perform a costly behavior which is insufficiently justified (Weick, 1964; Staw, in press). Although self-perception and dissonance are competing explanations here, similar manipulations could bear on de Charms' interaction hypothesis. It will be necessary to explore such parameters to determine the nature and conditions of the interaction.

Of particular theoretical interest are other variables which may determine reactions to attributional instability. An individual may simply assume that he is intrinsically or extrinsically motivated. Which of these he assumes may well depend on personality factors such as Rotter's (1966) dimension of internal versus external control, on situational norms about how one ought to be motivated, or on the effectiveness of his task performance (one is usually intrinsically

motivated on the things he does well). Additionally, an individual may attempt to clarify his self-perception, such as by considering the implications of how the reward was presented (e.g., Steiner's (1970) drive vs. bonus distinction).

The effect of intrinsic and extrinsic factors on satisfaction and task persistence obtained in this study offers strong support for the interaction of intrinsic and extrinsic motivation. It remains for future research to specify the necessary conditions for this interaction.

Footnotes

¹The authors wish to thank James Grigg and Ramamoorthi Narayan for their assistance in this study. Support for the study was provided by the University of Illinois Graduate Research Board.

²Theoretical discussions of the interaction of intrinsic and extrinsic motivation tend to parallel those in the dissonance literature in that there are often elaborate dissonance (or self-perception) effects while there are simply reinforcement effects.

³It should be noted that care was taken in designing this study to avoid any confusion with insufficient justification effects. The low intrinsic motivation condition was designed not to be very negative. Subjects were required to perform a very routine task as part of their normal research requirement. This procedure had none of the trappings associated with dissonance effects (such as choice, negative consequences, or the withdrawal of incentives). Our low intrinsic motivation condition is more similar to the reinforcement condition of the "dissonance studies."

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Table 1
Mean Ratings of the Puzzle Task

Variable	Blank Puzzle	Picture Puzzle
boring-interesting	3.47	4.73**
bad-good	3.60	4.67**
monotonous-exciting	2.60	3.73**
painful-pleasurable	4.00	4.67*
easy-hard	1.47	1.20
complex-simple	6.47	6.67
active-passive	4.73	3.73
slow-fast	5.07	5.47
constrained-free	4.80	4.40
intuitive-rational	4.33	4.20
ordinary-novel	3.07	4.00
ambiguous-clear	6.47	5.87
rigid-loose	3.47	4.40

Note. The semantic differentials were scored from 1 to 7 in the direction of the adjective on the right.

* $p < .05$, one-tailed t test.
** $p < .01$, one-tailed t test.

Table 2
Analyses of Variance

Variable	Blank-Picture (T)		Source		T x M	
	F	P	Money (M)		F	P
			F	P		
Enjoyable	1.85	N.S.	< 1	N.S.	8.58	< .006
Time volunteered ^a	< 1	N.S.	< 1	N.S.	2.31	< .138
Work vs. leisure	6.77	< .013	1.90	N.S.	5.27	< .028
Perceived effort	< 1	N.S.	5.44	< .025	< 1	N.S.
Awareness of Extrinsic Motivation	4.26	< .046	< 1	N.S.	< 1	N.S.
Awareness of Intrinsic Motivation	< 1	N.S.	< 1	N.S.	< 1	N.S.

^aSince the distribution of time scores tends to be skewed, a natural log transformation was used for this analysis of variance.

Table 3
Mean Time Volunteered and Perceptions

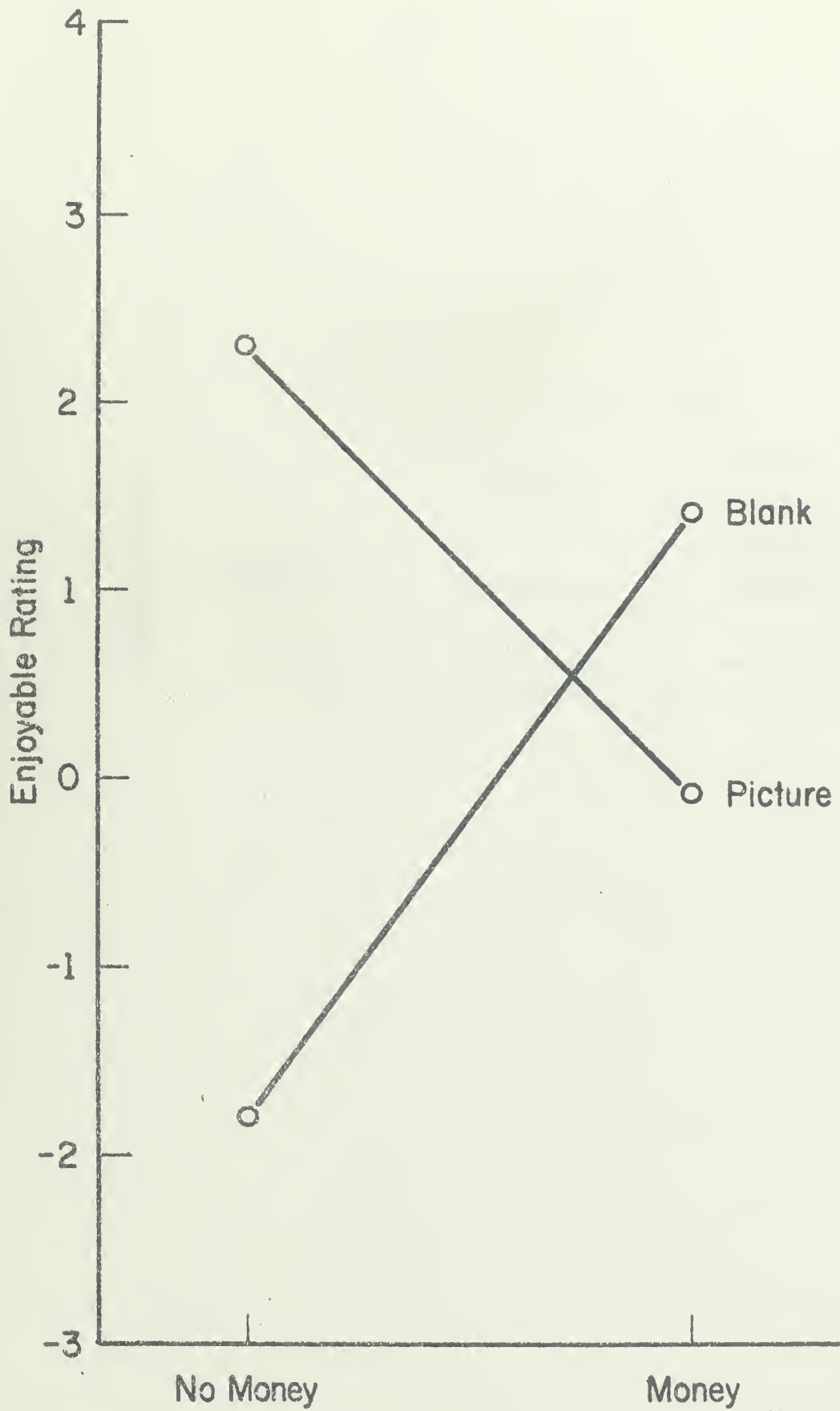
Variable	Blank		Picture	
	No Money	Money	No Money	Money
Time volunteered	22.50	28.50	40.50	24.00
Work vs. leisure ^a	-.70	1.70	2.50	1.90
Perceived effort	7.60	5.30	6.50	5.40
Awareness of Extrinsic Motivation	7.10	6.30	4.70	4.30
Awareness of Intrinsic Motivation	4.90	5.40	5.90	5.40

^aThe higher the number, the more leisure-like the task, the more perceived effort, etc.

Figure Captions

Figure 1. Mean ratings of task satisfaction for the interaction between intrinsic and extrinsic motivation.

Figure 2. A means-ends analysis of the self-perception of motivation.



Affect of MeansAffect of Ends

	negative or neutral	positive
negative or neutral	No Motivation	Extrinsically Motivated Behavior
positive	Intrinsically Motivated Behavior	Unstable



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