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LOCUS OF CONTROL AND MONETARY REWARDS AS RELATED TO
CAUSAL ATTRIBUTIONS, INTRINSIC MOTIVATION,
PERFORMANCE AND SATISFACTION: TOWARD A
COGNITIVE THEORY OF MOTIVATION

DISSertation

Presented in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy in the
Graduate School of The Ohio State University

by

Gerald Alan Kesselman, B.A., M.A.

* * * * *

The Ohio State University
1975

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CHAPTER I

INTRODUCTION

Psychologists concerned with work motivation have viewed an individual's job performance as being a function of both his ability and motivation. That is, if ability is a fixed constant, performance can be improved through increases in motivation. Some theorists (Maier, 1955) have even suggested a multiplicative relationship between motivation and ability such that if either is low, improvements in the other will not have much influence on job performance. It is apparent that other factors such as self-generated or group induced pressures to perform (Graen, 1969; Mitchell & Nebeker, 1973), availability of resources and other situational elements influence motivation and performance.

Motivational theories can be subsumed under two general categories, often labeled mechanistic (Hull, 1943; Spence, 1956) and cognitive (Atkinson, 1964; Lewin, 1938; Tolman, 1938). Cognitive theories generally assume that mediating cognitive processes occur between stimulus and response, represented as $S \rightarrow$ cognition $\rightarrow$ $R$ such that incoming information (stimulus) is "encoded into a belief system that gives it 'meaning.' The subsequent response is then guided by the intervening structure of thought (Weiner, Frieze, Kukla, Reed, Rest, Rosenbaum, 1971)." On the other hand, mechanistic theories
of motivation follows a S + R paradigm omitting mediating thought processes. Current thinking on work motivation tends to favor the cognitive approach as many theorists feel that this approach better explains the acquisition, avoidance, and prediction of work-related behaviors (see Lawler, 1971 and Weiner, 1972 for excellent discussions on this point).

Psychologists have also tended to view motivation as being either intrinsic or extrinsic. Behavior is extrinsically motivated to the extent that an individual engages in a particular activity in order to obtain an external reward. Intrinsic motivation may be defined in terms of behavior which is energized, directed, or sustained for the purpose of obtaining self-mediated rewards. Obviously, there are degrees of each and the two are not necessarily mutually exclusive. The essential difference, however, between these two kinds of motivation lies in the reason for the behavior, not in the behavior itself.

The general purpose of this research will be to present and test portions of a newly developed cognitive theory of motivation. The general framework relies on self-perception theory (Bem, 1967) which contends that individuals infer their own internal states (i.e., perception of intrinsic versus extrinsic motivation, attitudes, motives and feelings) from an observation of their behavior and the contingencies under which it occurs. These self-perceptions in turn produce changes in behavior, thus linking thought to action.

The next section outlines several theoretical frameworks relating to self-perception processes in motivation. Following this presentation, Chapter Two will examine an area of research known as cognitive
evaluation theory (Deci, 1971). This area of research will form the
rudiments of the motivation model which will be presented in the
third chapter. Chapter Three will also deal with the methodology of
the proposed research, including independent, moderating and dependent
variables under consideration.

Cognitive Evaluation Theory

Cognitive evaluation theory is based on a set of research studies
conducted by Deci and his colleagues. Relying on a self-perception
framework, it is primarily concerned with examining the construct of
intrinsic motivation. The theory proposes that one's behavior is
based on his perception of why he is doing the activity. Intrinsic
motivation, it is assumed, may be affected either through the process
of change in the perceived locus of causality for a given behavior,
or through the process of feedback.

When a person is intrinsically motivated, the perceived locus of
causality (Heider, 1958) for that behavior is located within the
individual. Perception of performing an activity for money, for
example, changes this locus from inside the person to the environment.
In other words, when the perceived locus of causality changes from
within the person to the environment, intrinsic motivation decreases.

A second process, feedback, also affects intrinsic motivation
because it provides additional positive or negative value to the
activity. Thus, positive feedback (verbal reinforcement) should
increase intrinsic motivation while negative feedback or threats of
punishment associated with task performance should decrease
intrinsic motivation.
Deci and his colleagues have reported evidence which they interpret as being supportive of cognitive evaluation theory. Specifically, when applied to an interesting task, they found that contingent extrinsic rewards, threats of punishment and negative feedback decrease intrinsic motivation, noncontingent rewards leave intrinsic motivation unchanged (these rewards, it is assumed, do not change the perceived locus of causality), and positive verbal reinforcement increases intrinsic motivation.

**Insufficient Justification and Overjustification**

The basic assumptions of the insufficient and overjustification hypothesis is that people tend to maintain a balance between their behaviors and the justification for their behaviors.¹

If an individual engages in a particular behavior, but has little justification for that behavior (insufficient justification), he will tend to strengthen his beliefs and attitudes to justify that behavior. In other words, the individual assesses that he engaged in that behavior because he liked it.

On the other hand, if an individual is financially rewarded for engaging in a given behavior, the rewards, if large enough, will provide the justification for the behavior and the strength of the attitude justifying that behavior will decrease. To attribute the behavior to both the rewards and the interest in the task would

---

¹This assumption is identical to dissonance theory (Festinger, 1957) assumptions. However, dissonance theory is not generally concerned with the self-attribution processes involved in self-perception theory.
provide an imbalance whereby there would be too much justification for the behavior (overjustification).

The overjustification hypothesis predicts that individuals who expect and are paid for engaging in an inherently interesting task will reattribute the cause of their behavior from internal to external factors, resulting in decreased intrinsic motivation. Thus, these predictions are identical to those made by cognitive evaluation theory. Under conditions of sufficient or overreward, the individual infers that "he did not want to perform the activity, that he does not believe in it, or it does not reflect his true opinions (Bem, 1972, p. 39)."

In sum, "if external reinforcement contingencies controlling an individual's behavior are salient, unambiguous, and sufficient, the individual attributes his behavior to the controlling circumstances. If, however, external rewards are unclear, invisible or psychologically insufficient to account for his actions, the person attributes his behavior to his own dispositions, interests and desires (Cohen, 1974, p. 44)."

An important question seems to relate to the size of the extrinsic reward, and its effect on intrinsic motivation. Both cognitive evaluation and self-perception theory predict that under low or no incentive conditions, individuals will increase their liking and intrinsic motivation for the task since in the absence of sufficient extrinsic rewards, behavior will be causally attributed to the self. Under high extrinsic incentive conditions, individuals are predicted to decrease their intrinsic motivation as they
attribute their engaging in the behavior to the rewards and not to their interest in the task. The perception of rewards as either insufficient, sufficient, or oversufficient might depend on attributes of the task (i.e., dull versus interesting, difficult versus easy), individual personality variables, and other situational factors.

Expectancy Theory

Expectancy theory evolved from the works of Lewin (1938) and Tolman (1932). The theory, in general, emphasizes that the motivation to perform an act is a function of the expectancy that performing that act will lead to some desired outcome, and the value of that outcome to the individual. As such, expectancy theory predicts higher levels of motivation and performance under high as opposed to low extrinsic incentive conditions, provided the incentive is positively valued. These predictions run counter to those of cognitive evaluation theory, the overjustification hypothesis and self-perception theory which predict that high extrinsic rewards undermine intrinsic motivation and ultimately performance.

A recent review of the expectancy literature by Mitchell and Biglan (1971) and Heneman and Schwab (1972) has indicated some support for the theory in predicting an individual's motivation and performance. However, expectancy theory does not specifically address the question of the effect of extrinsic rewards on intrinsic motivation. A review of this literature follows.
CHAPTER II

LITERATURE REVIEW

Cognitive evaluation theory (Deci, 1971, 1972, 1972b, Deci, Benware and Landy, 1973; Deci and Cascio, 1972; Deci, Cascio and Krussel, 1973) self-perception theory (Bem, 1967), and deCharms' (1968) concept of personal causation all predict that extrinsic rewards administered to an individual for engaging in an interesting task will subsequently decrease intrinsic motivation on the task once the reward is withdrawn.

On the other hand, contingency management systems as well as expectancy theory have stressed the importance of tying external rewards to performance in order to increase future performance and satisfaction. Advocates of these approaches suggest that piece-rate pay systems can be beneficial, and results have tended to support this position (Lawler, 1971). However, more recent approaches to management (Argyris, 1964; Likert, 1961; McGregor, 1960) have emphasized participative management systems and the importance of individual self-actualization and commitment to organizational goals in order to improve both individual and organizational effectiveness. Constructs such as job involvement (Lodahl and Kejner, 1965) and intrinsic motivation have cropped up more frequently in the management and scientific literature.
Current thinking seems to stress that intrinsic motivation is more important than extrinsic motivation, although it would be beneficial if both were present at a high level. The hypothesis that there is an interaction between intrinsic and extrinsic rewards is contrary to traditional approaches to motivation (e.g., Porter and Lawler, 1968) and merits our attention. The key question is whether an individual's intrinsic motivation to do a job will remain unaffected by external rewards.

One important set of research studies in this area has been conducted by Deci and his colleagues. In all of the studies reported by Deci and his colleagues, intrinsic motivation has been operationalized behaviorally as the amount of time subjects spent in an 8-minute free choice period performing the experimental task when other alternatives were available.¹

Deci (1971), in his first test of cognitive evaluation theory, reported three experiments. Two of these were conducted in the laboratory and one of them in a field setting.

Experiment I utilized 24 introductory psychology students as subjects. Twelve were randomly assigned to either a control or experimental group where they were required to work on an interesting puzzle called Soma, produced by Parker Brothers. The experimental design involved three separate 13 minute sessions of task performance.

¹Subjects could either read magazines, remain idle, or work on the experimental task. However, no attempt was made to assess the relative attractiveness of these alternatives, or the actual amount of time spent on each of them.
(hereafter referred to as the three-stage paradigm). A free time
period was embedded after each session whereby a second experimenter,
through a one-way mirror, clocked the amount of time each subject
spent working on the experimental task. "The criterion selected
for whether or not a subject was working on the task during the free
choice period was that he be manipulating and looking at one or more
of the pieces."

The only difference between the control and experimental group
was that during the second session, the experimental subjects were
rewarded $1 for each configuration they were able to reproduce.
There were four configurations in each session, so experimental
subjects could earn a total of four dollars. Thus, the pay was
expected and contingent on task performance. In the third session,
experimental subjects were told that they would not be paid
because of insufficient funds.

During the free choice period, the configurations which subjects
could work on were impossible ones to do. The rationale behind this
was that "this precluded the possibility that a subject would finish
a configuration and have that as a causal factor in determining
whether or not he continued working on the puzzle."

At the end of each session, the subjects were asked to rate on
a 9-point scale the degree to which they found the task interesting
and enjoyable. This was used as a check in order to rule out the
possibility that differential free time behavior was a result of
differential task interest between the two groups. The results
indicated that "at all three sessions, both the experimental and
control subjects found the task interesting and enjoyable. The session averages ranged from 7.25 to 8.00 and were not significantly different between groups or among the sessions.

In order to test the hypothesis that contingent monetary rewards decrease intrinsic motivation, Deci examined the difference between time 1 and time 3 intrinsic motivation for both groups.

The results indicated that during the second session when external rewards were introduced, the intrinsic motivation of the experimental group increased from 248.2 seconds following session 1 to 313.9 seconds after session 2, whereas control subjects intrinsic motivation remained relatively unchanged. However, after session three when rewards were withdrawn, the experimental group's intrinsic motivation decreased to 198.5 seconds; 49.7 seconds below that of session 1. To test the hypothesis, Deci used the following formula: $E(T3-T1) - C(T3-T1)$ $E =$ experimental group and $C =$ control group, and the results were significant at the .10 level. Deci states, however, that "... there were only 24 subjects in the experiment, and the significance was only at the .10 level, so additional evidence on the validity of the finding is needed."

However, there are some other problems involved in this and other studies which Deci and his colleagues have conducted in addition to the lack of statistical significance, as the following comments indicate:

1. Calder and Staw (1974) point out that none of the Deci studies reported subjects' task performance. Task performance is therefore an uncontrolled variable which might cause differential
intrinsic rewards. That is, there is a tendency for individuals who perform better to obtain greater rewards and to enjoy the activity more than those who perform less well. In summary, performance differences might be responsible for differences in intrinsic rewards rather than or in addition to the experimental treatment.

2. The introduction of extrinsic rewards might cause an increase in effort expenditure while performing the task, and in a subsequent free time period, less time might be spent on the task due to such factors as satiation or fatigue rather than any cognitive reevaluation of why one is performing the task (Calder and Staw, 1974). This explanation for the findings is possible, but the data from experiment I do not support this interpretation as free time behavior increased following extrinsic rewards.

3. It is unclear that the amount of time spent in a free choice period working on the experimental task is a valid measure of intrinsic motivation (Calder and Staw, 1974; Cohen, 1974; Foster and Hamner, 1974). One might reason that if one is intrinsically motivated to perform an activity, he should enjoy performing that activity. Thus, some researchers have used self-mediated rewards (Cohen, 1974) which result from performing the activity as their measure of intrinsic motivation. This definition closely parallels Porter and Lawler's (1968) concept of intrinsic rewards, which are rewards an individual administers to himself as a result of his performance. Similarly, other researchers have used task enjoyment or task satisfaction (Calder and Staw, 1974; Kruglanski, Friedman, and Zeevi, 1971) as a
measure of intrinsic motivation. Cohen (1974) has recently found that self-mediated rewards were positively related to task performance (as predicted by expectancy theory), and that free time behavior (Deci's measure of intrinsic motivation) was negatively related to both task performance and internally mediated rewards. This finding raises serious questions about the construct validity of Deci's measure.

4. There is no data presented by Deci (1971) showing that the rewards which were administered were perceived by the subjects as equitable. Thus, it is possible that the experimental subjects increased free time behavior after session 2 due to overpay inequity. Further, there is the problem of the withdrawal of expected contingent rewards at session 3. That is, it is possible that subjects expected rewards after session 3 since they had received them after session 2. However, they were not told about the withdrawal until session 3. Thus, the drop in free time behavior after session 3 may have been caused by the withdrawal of expected rewards rather than by a cognitive reevaluation or self-perception explanation. Thus, dissonance theory is a plausible explanation for the findings. A better procedure would have been to inform the subjects at the outset about the pay contingencies.

Deci (1971) sought to extend his laboratory findings to the field. The experiment was conducted at a college newspaper where six students who worked on the newspaper (4 experimental, 2 controls) served as subjects. Utilizing the three-stage paradigm, subjects in the experimental group were paid 50¢ per headline written during the
second period (which lasted three weeks), after which they were told that "all the money had been exhausted and they would no longer be paid."

The performance on the headlines were used as the measure of motivation. "It was assumed that the more quickly someone performed, the more highly motivated he was to do the task (Deci, 1971)."

Current thinking is that motivation and performance are conceptually distinct, and thus as Cohen (1974) points out "it is somewhat perplexing as to why Deci chose to measure intrinsic motivation in terms of the speed with which a headline was written when in the laboratory it was measured by the length of time an individual spends working on the task."

In addition to the performance measure, the absentee rate was used to measure satisfaction. The results indicated support for the hypothesis in that the control group increased its performance from time 1 to time 3 whereas the experimental group remained the same. The difference in performance between the two groups was significant at the .01 level.

It is somewhat perplexing as to why the control group increased its performance over time and the experimental group remained essentially the same. Cognitive evaluation is one explanation, but differential experience or history effects is another. The fact that there were only two persons in the control group might have resulted in increased attention given by the supervisor which in turn led to increased productivity. Of course, this is just speculation, but other alternative explanations for the findings other than cognitive
evaluation are possible. The most serious limitations of this study, however, appear to be the small sample size and the measure of intrinsic motivation which was utilized.

In experiment III (Deci, 1971), 24 introductory psychology students (12 controls and 12 experimentals) served as subjects in order to test the verbal reward hypothesis. The three stage paradigm was utilized substituting verbal rewards for monetary rewards during session two. Through an intercom, the experimental administered verbal praise to the subjects in the experimental condition.

Results indicated that verbally rewarded subjects decreased 4.7 seconds from time 1 to time 3 while control subjects decreased their free time behavior 182.1 seconds. Thus, verbally rewarded subjects showed less of a decrease than did controls. Further, initial time 1 control group free behavior was significantly greater than that of the experimental group at time 1. When initial score variance was removed, the significance was lowered from .05 to .10. Thus, the results marginally support the verbal reward hypothesis. In addition, no significant differences were found between the two groups in terms of task interest and enjoyment at the end of each session and across the sessions thus disconfirming the hypothesis if task enjoyment is used as a reflection of intrinsic motivation. In sum, the results of this experiment do not clearly support the contention that verbal rewards increase intrinsic motivation.

In another study, Deci (1972a) examined the effects of verbal and monetary rewards, as well as inequity on intrinsic motivation. He tested three hypotheses: (1) contingent monetary payments for
an individual's performance will decrease subsequent intrinsic motivation; (2) verbal rewards will increase subsequent intrinsic motivation; and (3) inequitably overpaid subjects performing an interesting task will increase the amount of time spent working on the task in order to restore equity. In addition, the effects of external rewards (money and/or verbal praise) on intrinsic motivation was investigated by sex.

Overpay inequity was induced by "paying subjects prior to the free period while equity was induced by paying subjects at the end of the free period" (money before versus money after conditions). Ninety-six undergraduates subjects were randomly assigned to 6 conditions: no money, money before, money after, crossed with verbal reward versus no verbal reward (a 3 x 2 design). The third variable, to which Ss were nonrandomly assumed, was sex, thereby making a total of 12 conditions, 6 for each sex (see next page for a diagram of the 12 cells).

The experimental paradigm involved only one session instead of three and subjects in the pay condition received $1 for each of four configurations correctly reproduced, while control subjects received no money for their participation. This paradigm would seem to eliminate the problem of withdrawing previously expected rewards.

As in other studies by Deci, if a subject was unable to do a configuration within ten minutes, he was stopped and told how to do it. This let him know that all configurations were possible in order to control for the Zeigarnik (1927) effect.
The prediction was that the group which actually received the cash after the free choice period (money after) would spend the least amount of time on the puzzles, that the no money group would spend more time, and the money before group would spend the most time. Also, verbally rewarded subjects would spend more time on the task during the free choice period than those subjects not verbally rewarded.

Results indicated that of the 12 cells, all but two were ordered properly as indicated below:

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<th>Females</th>
<th>Males</th>
<th>Verbal</th>
<th>Females</th>
<th>Males</th>
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<td>65.6</td>
<td>240.4</td>
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<tr>
<td>No Money</td>
<td>292.4</td>
<td>124.4</td>
<td>142.5</td>
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<td>Money Before</td>
<td>346.0</td>
<td>248.6</td>
<td>384.4</td>
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</tbody>
</table>

The data were submitted to a 3 x 2 x 2 Anova (Three levels of money x verbal x sex) on the amount of time that subjects spent on the puzzle during the 8 minute free choice period. The results indicated a significant main effect for money ($F = 6.95, p < .005$). However, as Cohen (1974) points out, Deci (1972a) did not submit this main effect to a post hoc analysis. Cohen (1974) collapsed the data across sex and verbal rewards, and found that the mean time for free
behavior for the money before, no money, and money after groups to be 342.83, 189.27, and 169.98 respectively. Posterior analysis by Cohen (1974) indicated that the only significant difference (p < .05) exists between the money before and the other two groups. Thus, the overpay hypothesis appears to be supported, while the contingent pay hypothesis is disconfirmed. The verbal reinforcement main effect was not significant (p = .16) and thus did not support the contention that verbal rewards increase intrinsic motivation. However, it was found that verbal reward increased intrinsic motivation for males but left female intrinsic motivation unchanged.²

A final study reported by Deci (1972b) deals with the effects of noncontingent monetary rewards on intrinsic motivation. Utilizing the one-stage paradigm, experimental subjects (n = 24) were paid $2 at the end of the experiment for participating in the study regardless of their performance, while control subjects (n = 16) were not paid at all. The results indicated that there was no significant difference between the two groups (t = .22) in the amount of free period behavior. Deci (1972b) interprets these results as indicating that noncontingent pay has no effect on intrinsic motivation since subjects are less likely to perceive themselves as being motivated by the rewards. Calder and Staw (1974) point out that this conclusion is not justified by the data since Deci has essentially affirmed the

²Additional studies by Deci, Cascio and Krussel (1973) and Deci and Cascio (1972) have investigated the relationship between sex and verbal rewards on intrinsic motivation, as well as the effects of negative feedback and punishment on intrinsic motivation. These studies, as well as their findings, will not be discussed as they are not directly relevant to this review.
null hypothesis. In other words, it is not possible to demonstrate that the lack of an effect was caused by the noncontingent rewards.

In summary, the research reported by Deci and his colleagues does not lend strong support to the hypotheses tested due to both (a) lack of statistical significance, and (b) methodological problems inherent in the research.

A second set of research studies dealing with the effects of extrinsic rewards on intrinsic motivation has been conducted by researchers other than Deci and are as follows:

Foster and Hamner (1974) attempted to assess the effects of monetary reward on intrinsic motivation. They employed a 2 x 3 factorial design with two levels of task interest (interesting vs. boring) and three levels of reward (contingent, noncontingent and no reward). The interesting task consisted of coding and transferring data to a Fortran work sheet from a survey on sexual attitudes whereas the boring task involved the same operations but pertained to a math survey. Contingently paid Ss received 5¢ for each questionnaire completed (20 minute time limit) while Ss in the noncontingent condition received 75¢ for their participation in the experiment, regardless of their performance. Quantity of task performance was assumed to reflect intrinsic motivation. It was predicted that contingent pay would increase intrinsic motivation on the dull task, but decrease it on the interesting one.

The results failed to support cognitive evaluation theory in that contingent pay did not decrease intrinsic motivation on the interesting task.
Cohen (1974) tested cognitive evaluation theory utilizing a $2 \times 2 \times 2$ crossed factorial design. The experimental conditions consisted of task choice (choice versus no choice), verbal reward (verbal reward versus no verbal reward), and monetary reward (money versus no money).

Subjects ($n = 13$ per cell) were randomly assigned to one of eight groups, and each subject worked on a total of four embedded word problems (two minutes for the first one which was a sample, ten minutes each for the remaining three). After $S$s completed work on the tasks, they were exposed to a twelve minute free period where a second experimenter observed them through a one-way mirror. Post experimental questionnaires followed the free period (one-stage design).

The embedded word task involved finding words within a group of letters forming a square matrix and then circling the words. Subjects who received a reward (money and/or verbal) were on a contingent and continuous reinforcement schedule. Subjects in the monetary reward group received 5¢ for each word they found while working on the task. Subjects in the verbal reward conditions were reinforced verbally by the experimenter while they were performing the task. Subjects in the task choice condition were given a choice between

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3Subjects, as in Deci's research were unaware that they were being observed during the free time period.

4In order to insure that the reward was salient, $S$s in the money condition were instructed to remove a nickel from an ashtray next to them each time they found a word. Formal pay by the experimenter occurred after task performance and before the free period.
performing the embedded word problems or mathematical decoding problems (all Ss chose the former, however). There were twelve embedded words in each ten minute session, and thus Ss in the monetary conditions could earn a total of $1.80.

Intrinsic motivation was measured in two ways: (1) the amount of time spent working on the task during the free period (recorded by a second experimenter with a stop watch), and (2) a self-report questionnaire of perceived internally mediated rewards resulting from task performance.

Manipulation check data revealed that the experimental manipulations held, that the pay and/or verbal rewards dispensed were perceived as equitable and contingent on performance, and that Ss perceived the experimental task as interesting. Further, data pertaining to Ss' ACT (Math and English) scores, grade-point average, and performance on the sample embedded word problem was analyzed in order to insure that there were no differences among the Ss across conditions with regard to ability. No important differences were found.

The results indicated that contingent extrinsic rewards which are perceived as equitable did not appear to negate intrinsic motivation. Some of the more important findings were: (a) money led to a greater satisfaction with pay as well as a greater willingness to recommend the task to others; (b) monetary reward caused participants to take more time to work on the task and perform more poorly in terms of the number of words found, although not significantly so; (c) the
negative impact of monetary rewards and the positive effect of verbal praise on free period behavior (intrinsic motivation) did not occur; (d) when the sample was divided on the basis of sex, it was found that males did not show significantly higher intrinsic motivation than females; (e) subjects who received monetary rewards tended to perceive the task as less dull; (f) intrinsic motivation as measured by self-mediated rewards was strongly related to task performance as one might expect, but negatively related to free period behavior. Free choice behavior was negative related \( r = -0.16 \ p < .10 \) to performance; (g) subjects who were given the opportunity to choose the task on which they worked enjoyed the task more than Ss who were not given a choice; and (h) task enjoyment was significantly related to intrinsic motivation as measured by self-mediated rewards but had a zero relationship with Deci's measure of intrinsic motivation.

A study by Calder and Staw (1974b) provides some positive evidence for the interaction of intrinsic and extrinsic motivation. It was hypothesized that extrinsic rewards would decrease intrinsic motivation on an interesting task, but not for a dull one. The experimental task consisted of having Ss solve 15 jig-saw type puzzles. The manipulation of intrinsic motivation was accomplished by having puzzle parts blank for one group of subjects versus having interesting pictures on the puzzle parts of another group. The task was simple enough (matching a puzzle part with its outlined shape on a board) such that differences in performance across Ss was eliminated in order to insure that differences in motivation were not a result of differences in performance.
The experimental design was a 2 x 2 crossed factorial with a dull versus an interesting task (high vs. low intrinsic reward) and money versus no money conditions (extrinsic reward levels). Ten college subjects were randomly assigned to each of the four experimental cells (n = 40). Subjects in the money conditions were paid $1 for the twenty to thirty minutes of their time. The authors state that this amount was equitable, but no data is presented to support their contention. A $1 bill was placed in clear view after the fifteenth puzzle at the end of the table on which subjects were working to insure that the reward was salient. Before Ss began working, the experimenter pointed to the money and said "when you finish, you can have the dollar over there." Thus, the reward "was equitable, salient, expected, noncontingent, and given at the end of the task."

The dependent measure of intrinsic motivation was assumed to be reflected by (1) task satisfaction, measured by a one item 17-point rating scale concerning the extent to which Ss found the puzzles enjoyable; and (2) a behavioroid measure of persistence, where Ss were asked to indicate how much, if any time, they wished to volunteer for in future experiments of a similar nature without payment. The amount of time Ss volunteered for was coded in minutes. It should be pointed out, however, that it seems possible that demand characteristics were operative in the behavioroid measure. Further, relating to their task satisfaction scale, any one item rating scale may lack sufficient reliability to serve as an adequate representation of that construct.
Analysis of variance on the task satisfaction measure revealed a significant blank-picture by money interaction. For the low intrinsically motivating blank puzzle task, the introduction of money increased task satisfaction. For the high intrinsically motivating picture puzzle task, the introduction of money decreased task enjoyment. Omega square or similar statistics indicating the proportion of variance accounted for by the interaction should have been reported. Similar results, although not statistically significant, were found for the behavioroid measure of persistence. In sum, these findings support the contention that intrinsic and extrinsic motivation interact with each other.

Calder and Staw (1974b) point out, however, that such an interaction need not always occur, and note the existence of boundary conditions such as task parameters, reward properties, and individual difference variables. More specifically, previous studies by Lepper, Greene and Nisbett (1973) and Ross (1973) have suggested that the reward must be salient and expected for intrinsic motivation to decrease with the introduction of a reward. Personality variables such as internal-external locus of control may moderate the effects a reward has on an individual's intrinsic motivation.

A final set of research studies to be considered has been conducted primarily with children, and the results have tended to support cognitive evaluation theory predictions.

Kruglanski, Friedman, and Zeevi (1971) examined the effects of an extrinsic reward on the quality of performance and degree of task
enjoyment for 32 Israeli high school students. Subjects volunteered for participation in the study and were randomly assigned to either a no incentive (NOINC) or an extrinsic incentive (EXTINC) condition. The incentive was a guided tour of the department of psychology at the Tel-Aviv University, and was introduced only after Ss had volunteered. Such an incentive (which was noncontingent) was deemed to be highly attractive to Ss as per informal conversations with the experimenters. Post experimental questionnaires followed completion of the tasks, which took about two hours.

Dependent variables included five qualitative aspects of task performance (two recall, two for creativity, one for the Zeigarnik effect), and measures of task enjoyment and willingness to participate in similar projects in the future.

The results indicated that: (1) recall was better in the NOINC versus the EXTINC condition (p < .01); (2) creativity was higher in the NOINC condition (p < .01); (3) NOINC Ss recalled a higher proportion of incompleted to completed tasks (p < .01) than did EXTINCS; (4) NOINC Ss displayed greater task enjoyment than EXTINCS (p < .06); and finally (5) a greater proportion of Ss were willing to participate in future projects of the same kind in NOINC (p < .09) than in EXTINC. The authors conclude that the data demonstrate higher quality of task performance and satisfaction in the absence of extrinsic incentives.

Calder and Staw's (1974) comments concerning the possible role of differential performance as a causal factor of intrinsic motivation and satisfaction appears to be a relevant and possible explanation for
these results. That is, it is possible that performance resulted in
differential task enjoyment and willingness to participate in future
experiments rather than the incentive versus no incentive manipula-
tion. In addition it is not clear from these results why the NOINC
Ss performed the experimental tasks at a significantly higher level
than subjects receiving an extrinsic reward. That is, was the superior
performance of NOINC Ss necessarily due to the lack of incentive, or
to some other factor, such as differences in ability levels, which
were not measured? These problems, as well as the small sample size
(N = 32) tend to make these results less conclusive.

However, several important questions for future research to
examine emanate from the Kruglanski et al. study: (1) If these find-
ings are indeed valid, can differences in culture serve as a possible
boundary condition? (2) Does the kind of incentive offered (e.g.,
money versus some other nonmonetary incentive) make any difference?
(3) Is it necessary for the reward to be perceived as salient in order
that extrinsic rewards undermine intrinsic motivation? The results
of this study do not support this contention, but Ross (1973) found
that preschool children given a salient contingent reward displayed
less interest in performing a target activity than subjects in a
control or nonsalient reward condition. Thus the role of salience
has not been firmly established at this time. (4) Does it make any
difference if the reward offered is contingent or not on perform-
ance? (5) Does the magnitude of the reward offered, or whether or not
it is expected make a difference?
Lepper, Greene, and Nisbett (1973) divided 51 nursery school children into an experimental group (E1) which expected and received an extrinsic reward for engaging in a drawing task with magic markers (N = 18), a second experimental group which did not expect, but received the same extrinsic reward as Ss in E1 (N = 18), and a control group (N = 15) which did not expect nor receive an extrinsic reward. Subjects in the reward conditions received a certification with a gold seal and ribbon for performing the task. The extent to which the children played with the magic markers in a subsequent free play period was later recorded and served as a measure of intrinsic motivation.

Results indicated that the amount of free time spent on the markers was lowest for the group expecting and receiving the reward (E1), intermediate for the no-reward control group, and highest for the group not expecting, but receiving the rewards. Calder and Staw (1974) point out that any decrease in intrinsic motivation following an extrinsic reward may be limited to expected rewards, as evidenced by the findings from the Lepper et al. Study (1973).

Summary of Literature Review

The results of the studies reviewed in this chapter appear, on the whole, to be non-supportive with regard to the hypothesis that extrinsic rewards undermine intrinsic motivation.

Throughout this review, problems in research design, methodological weaknesses, and criterion problems were pointed out. Some suggestions on how to improve the research in this area were, it
is hoped, implicit in this review, although many problems (i.e., criterion problems) were not dealt with.

When critically reviewed, the Deci studies do not offer strong support for the overjustification hypothesis, whereas the studies utilizing children as subjects are more supportive.

The present study seeks to eliminate some of the methodological weaknesses inherent in the Deci studies. In addition, the use of higher pay levels, as compared with those typically used in cognitive evaluation theory research should provide a stronger test of the theory. Finally, the possible moderating effects of personality structure (e.g., locus of control orientation) on an individual's perception of intrinsic rewards, is viewed as a useful area for research which might serve as an explanatory tool to help explain some of the contradictory findings in the literature.
CHAPTER III

METHODOLOGY

In reviewing the literature on the overjustification hypothesis, it appears that there is a large amount of negative evidence. However, some studies (e.g., Lepper, Greene and Nisbett, 1973) have utilized rather sophisticated procedures and have found support for the contention that extrinsic rewards undermine intrinsic motivation.

Although some theorists have examined the relationship between intrinsic motivation and external rewards, few have paid any attention to the relationship between this construct and performance. Thus, it is not clear whether intrinsic motivation is negatively, positively, or unrelated to performance. More importantly, under what conditions and for what types of individuals might we obtain these relationships? Thus, the major focus of this research is on individual performance and those variables which might influence or be related to performance.

Broadly speaking, there are three major questions of concern in this research: (1) a test of cognitive evaluation theory whereby subjects will perform an interesting laboratory task across differing pay levels. Measures of intrinsic motivation, performance and task satisfaction will constitute the major dependent variables of interest. In addition, causal attribution measures are employed as induction
checks. That is, in all the research concerned with cognitive evaluation theory (Deci, 1971) it has been assumed that pay changes the perceived locus of causality from internal to external sources. However, this assumption has never been tested; (2) an examination of the relationship between intrinsic motivation and performance across pay levels; and (3) the use of Rotter's (1966) internal-external locus of control construct as a possible moderator of the effects of contingent monetary rewards on intrinsic motivation, performance and satisfaction.

In order to define the parameters of this research more clearly, an attributional model of motivation has been developed incorporating the variables of locus of control, nature of the task, monetary rewards, causal attributions for performance, expectancy, intrinsic motivation, perceived effort, performance, ability and satisfaction. The outline of such a model was developed largely from the works of Weiner (1972) on attribution and achievement theory and Porter and Lawler's (1968) expectancy model of work motivation. A diagram of the model is presented on the following page.

Evidence for the Model

The first linkage in the model incorporates the locus of control construct as one determinant of causal cognitions. These cognitions in turn affect expectancy of effort resulting in performance and performance influencing rewards.

According to Rotter (1966), the locus of control construct is a generalized expectancy or belief individuals have about whether or not
Figure 1.—Proposed Motivation Model.
they have power over what happens to them. Internally controlled individuals perceive that events are a consequence of their own behavior and therefore under personal control whereas externally controlled individuals have a generalized expectancy that events which occur are unrelated to their own behaviors and therefore outside of their personal control.

According to the model, there are three factors which influence causal attributions: (1) the nature of the task; (2) locus of control orientation; and (3) past performance. Causal attributions may be internal or external, stable or unstable (Weiner, 1972). Accordingly, ability and effort are internal attributions whereas task difficulty and luck are external. However, ability and task difficulty are unlikely to change over time (stable) whereas effort and luck are more variable (unstable).

Nature of the Task

One variable which appears important in determining causal attributions is the nature of the task, and more specifically, the skill versus luck elements inherent in the task. According to Weiner et al. (1971) "If past behavior at a task is attributed to the fixed factors of ability or task difficulty, there should be fewer atypical aspiration shifts (increasing aspiration after failure or decreasing aspiration following success) than if the outcome of the prior performance was ascribed to the variable elements of luck or effort." Thus, it appears that the nature of the task may affect causal attributions.
**Internal-External Control**

Internally controlled individuals tend to make internal attributions whereas individuals high in external control tend to attribute their previous performance to external factors (i.e., luck and/or task difficulty).

The key element, according to Weiner (1972), is not whether causal attributions are internal or external, but whether they are stable or unstable. It is the stability dimension which influences future expectancies.

The research relating to this area has been conducted in an achievement motivation context. An initial study by Weiner and Kukla (1970) hypothesized and found that individuals high in achievement motivation are more likely to attribute success to themselves than are individuals low in achievement motivation; in other words, high achievement motivation was significantly associated with internality. In a study by Weiner and Potepan (1970), high achievement oriented college students tended to attribute their success to themselves, thus replicating the findings of Weiner and Kukla (1970). Achievement motivation and attribution of success to ability were significantly related ($r = .35$, $p < .01$) as were achievement concerns and effort attribution ($r = .12$). These studies, as well as experimental studies by Kukla (1970) and Cook (1970) support the following conclusions: (1) High achievement motivated individuals tend to be internally controlled. They believe that effort leads to performance and thus perform with high effort expenditure. They tend to view
their successful performance as due to high ability and effort. They persist in the face of failure since they perceive that failure is a result of a lack of effort, which is presumed to be modifiable. (2) Individuals low in resultant achievement motivation tend to attribute their behavior to external factors and do not view effort as significantly related to performance. As such, they tend to view success as a result of external factors (task ease) and failure caused by a lack of ability. Because of this (the belief that failure is due to a lack of ability, which is presumably unchangeable), they tend to quit rather than persist in the face of failure.

Performance Influencing Causal Conditions (Feedback Loop)

From the achievement motivation literature, performance on a given task can be viewed by an individual as either successful or unsuccessful. Performance outcomes affect future causal cognitions, but are first mediated by the achievement orientation of the individual. That is, high achievement oriented individuals tend to attribute their successes and failures to different factors than do individuals low in achievement concerns. These causal cognitions are assumed to affect one's expectancy of success and failure on a given task.

Relationship between Causal Cognitions and Expectancy

Weiner (1972) has postulated that expectancy change is determined primarily by ascriptions to stable versus unstable factors. For example, Meyer (1970) and McMahon (1971) found that in a failure
situation, expectancy decreases were greatest when individuals believed that low ability and/or a hard task (stable factors) are the causes of failure (which, as pointed out, are beliefs congruent with low achievement oriented persons). On the other hand, those individuals who ascribe failure to lack of effort or bad luck tend to show minimal decreases in expectancy (i.e., high achievement oriented person). Following a successful achievement outcome, causal ascriptions to stable factors (ability or task ease) tends to increase future expectancy of success, whereas ascriptions to effort or luck (unstable) minimize expectancy increases.

**Relationship of Expectancy to Behavior**

The interrelationships between expectancies and behaviors derives from expectancy theory of motivation (Porter and Lawler, 1968). Some support for the proposed linkages of expectancy, effort, performance and satisfaction has been found (Porter and Lawler, 1968; Greene, 1972; Kesselman, 1972; Kesselman, Hagen, Wherry, 1974). Although these studies were correlational, the pattern of observed relationships supports the linkages suggested by the model. However, there has been little empirical support for the inclusion of the ability variable as a mediator of the effort-performance linkage (Heneman and Schwab, 1972). From a theoretical viewpoint, however, it makes sense to include the ability variable since effort is not perfectly correlated with performance (Porter and Lawler, 1968; Williams and Seiler, 1973).
The monetary variable is hypothesized to have differential impact on attributions, expectancies, perceived effort, intrinsic motivation, performance and satisfaction for individuals who differ in their locus of control orientation (Rotter, 1966). Although the status of intrinsic motivation as a psychological construct is not yet clear (Calder and Staw, 1974), it is hypothesized that intrinsic motivation is a causal factor of performance. The exact nature of this relationship is not specified. The other linkages of the model (i.e., performance leading to rewards, rewards leading to satisfaction, etc.) have been investigated to some extent, but causal relationships are not at all definitive at this time.

Summary of Model

The proposed model is an exploratory one. It assumes that differences in locus of control (Rotter, 1966), the nature of the task (luck versus skill tasks, difficult versus easy tasks, interesting versus boring tasks, etc.), and performance feedback all influence causality attributions that performance was a function of ability, effort, luck and task difficulty. These ascriptions are viewed as being either internal or external, stable or unstable. Previous research has suggested (Weiner, 1972) that the stability-instability dimension directly affects expectancy level. Expectancy, in turn, is related to effort expenditure. Effort leads to performance, but is moderated by ability. Performance results in rewards, which in turn lead to satisfaction. It is proposed that the nature of the task, the individual's locus of control orientation (Rotter, 1966), and
the level of internally mediated rewards all determine intrinsic motivation. The exact nature of the relationship of intrinsic motivation with performance is not specified.

Evidence for some of these relationships in the motivation model has been presented. The model will serve as a guideline for some of the findings presented later.

Methodology

Task

A variant of a task utilized by Cohen (1974) was used in this research. The task consisted of six embedded word problems (the first one was a sample). "Each problem consists of a number of rows of letters in which twelve hidden words appear forward, backward, up, down or diagonally in the matrix. The task of each subject is to find as many of the twelve hidden words as possible in each of the problems (Cohen, 1974)."

Appendix A contains a copy of the six problems plus the task instructions which were employed during the experiment. All problems contain 21 rows and columns of letters.

This task was chosen because (1) pilot data (Cohen, 1974) indicated that college students find it interesting and enjoyable (an essential characteristic necessary to test the overjustification hypothesis), and (2) performance on the task is easily quantified.

Pilot Study: Design and Results

In the pilot study, subjects worked on the sample embedded word problem (with a two-minute time limit) followed by five additional
embedded word problems (see Appendix A) given in the same order to all 
subjects under four time limit conditions for each problem: (1) 6 
minutes (N = 9); (2) 8 minutes (N = 8); (3) 10 minutes (N = 9); and 
(4) 12 minutes (N = 8).

The results indicated that the eight (8) minute time limit 
yielded moderate intercorrelations among performance on the five 
problems (excluding the sample, median \( r = .44 \)), thus indicating that 
performance was somewhat reliable when subjects were given eight 
minutes to work on each problem (see Appendix B for results of pilot 
study).

Further, the eight minute time limit resulted in a task of 
moderate difficulty (another criterion used for selection of this 
time-limit) with a mean of approximately 6.0 for each problem. That 
is, the average number of words found was approximately six for each 
problem (maximum, it will be recalled, was twelve). However, under 
the four time conditions, there was a tendency for performance to 
increase as subjects worked from problem one to problem five, suggest­
ing two possible explanations: (1) the initial problems were more 
difficult than the latter ones, and/or (2) practice effects had 
occurred.

Based on the results from the pilot study, several important 
decisions were made regarding the two subsequent studies performed 
(described in next section): (1) subjects would be given eight 
minutes to work on each of the five embedded word problems; (2) in 
order to reduce potential practice effects and to maximize initial
learning, the sample problem (two minute time limit) as well as problems one and two, were designated as practice problems. After subjects performed each of these three problems (given in the same order to all subjects), the experimenter distributed a copy of each problem to the subjects showing where all the embedded words were located (see Appendix A for these instructions). Subjects had three minutes to study each problem before proceeding to the next one. Thus, subjects had 18 minutes of practice combined with knowledge of results in order to optimize learning in the practice phase; (3) the last three problems subsequently followed the practice phase and constituted the performance index. In order to minimize possible order effects, the order of these problems was counterbalanced yielding six possible order combinations (three factorial) within each condition.

The next section describes the two subsequent studies which were conducted in greater detail.

Experiment I

Fifty-five introductory psychology students participated in this study and were assigned to one of six conditions: a no pay-control group (N = 10); a 1¢ a word pay group (N = 7); a 5¢ a word pay group (N = 10); a 10¢ a word pay group (N = 10); a 15¢ a word pay group (N = 9); and a 20¢ a word pay group (N = 9).

Each subject was given a folder which contained the experimental tasks and post experimental questionnaires. Prior to the experiment, the experimenter signed the experimental cards of all subjects and
explained that the credit was being given to all subjects for coming to the experiment and that the credit was not, in any way, related to performance during the actual experiment.

All subjects performed the sample problem and problems one and two in their folder. Following each of these practice problems, the experimenter distributed a copy of each problem to the subjects which showed where all the embedded words were located. Three minutes was allotted to study the correct answers.

Following the practice phase, the experimenter distributed a cup to each subject, containing 36 poker chips for control subjects or money for the experimental subjects. Control and experimental subjects were tested separately.

For experimental subjects, the cup was filled with the maximum possible amount of money each subject could earn (36¢, $1.80, $3.60, $5.40, and $7.20 for the five pay groups respectively). The cups were filled by the experimenter prior to entering the experimental room and carried in a briefcase so that subjects would not be aware of the money during the practice phase.

Control and experimental subjects were instructed to remove a chip or the allotted money, respectively, each time they located a word when they began working on the last three problems. Experimental subjects were instructed that the money they earned during the experiment was theirs to keep.

For the control subjects, the rationale given for removing the chips was so they could keep better track of their performance
whereas subjects in the pay conditions were told that the research was supported by a departmental research grant and as an incentive to encourage good performance, all subjects were being paid the allotted piece-rate for every word they found.

All subjects were asked to record their performance on the practice and test trials on a Progress Report Form. Experimental subjects were also asked to indicate how much money they had earned for each of the last three problems (Progress Report Forms and post experimental questionnaires are located in Appendix B).^1

As previously indicated, the final three embedded word problems constituted the performance index in which control subjects were asked to remove chips and experimental subjects money from their cups. These three problems were presented in a counterbalanced order.

Following the completion of task performance, the experimenter went through each of the final three problems with all subjects individually, collecting their cups with the chips, and for experimental subjects, any left over change.

Subjects were then requested to complete the post experimental questionnaires.

When all subjects had completed filling out the questionnaires, they were debriefed. They were informed of the purpose of the research, the condition in which they had participated as well as why

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^1Subjects in the pay conditions were requested to add a column on the Progress Report Form indicating how much money they had earned for each problem.
they were asked to complete the questionnaires. In addition, Ss were asked not to speak to anyone about the nature of the experiment.

Experiment II

The primary purpose of this study was to (1) attempt to replicate some of the findings of experiment I, and more importantly, to (2) use Rotter's (1966) locus of control measure as a possible moderator of cognitive evaluation theory.

According to Deci (1971), the perceived locus of causality for one's behavior is one factor which determines intrinsic motivation. It would appear that externally controlled individuals would tend to view this locus as being primarily external to themselves and thus be primarily extrinsically motivated, whereas internally controlled individuals would have a greater tendency to be intrinsically motivated. Some recent literature suggests that externally controlled individuals are more receptive to extrinsic rewards than those internally controlled (Wood, 1974) and that externally controlled workers tend to be low in job involvement while internally controlled workers tend to be high on this dimension (Runyon, 1973).

The control construct, to this researcher's knowledge, has never been used in cognitive evaluation theory research. Its potential moderating role would seem to make it an important parameter relevant to this area of research.

Design

One hundred and fourteen introductory psychology students participated in this study and were assigned to one of three
conditions: a no pay-control group (N = 41); a 5¢ a word pay group (N = 36); and a 10¢ a word pay group (N = 37).

The experimental procedures were the same as those described for Experiment I, except that the Rotter (1966) locus of control questionnaire was added to the subjects' questionnaire packet. This questionnaire consists of 29 items, six of which are fillers to help disguise the nature of the instrument.

Summary

In general, the purpose of this investigation is two-fold: (1) to test and explicate some of the relationships among the variables proposed in the motivation model and (2) to determine whether cognitive evaluation theory has any merit (for what kinds of people and under what kinds of conditions) and whether the construct of intrinsic motivation is of sufficient importance in terms of its empirical relationship with performance and satisfaction to warrant our further theoretical and empirical attention.

Post Experimental Questionnaires

Manipulation Checks.—In order to insure that all participants perceived the manipulations to which they were exposed, several manipulation check items were included in the post experimental questionnaires:

(1) the equitability of the amount of money earned (in order to insure that over or under-pay inequity was not responsible for any variance in the dependent measures).
(2) the degree to which subjects perceived a contingency between performance and pay.

(3) the degree to which experimental subjects attributed their performance to the money they received.

(4) perceptions of task interest to insure that the task was indeed perceived as interesting.

Causal Attribution Data.—Subjects, after completing the task, were required to estimate the degree to which effort, ability, luck, and the difficulty of the task each contributed toward their previous level of performance. These four factors were rated on a one to five scale where a one represented no contribution and a five represented a maximum contribution of that factor toward performance.

These four items, found in Questionnaire D, were scored for internality and stability. The exact scoring procedures will be outlined in the next chapter.

Intrinsic Motivation.—Intrinsic motivation was defined theoretically in chapter one as rewards an individual administers to himself as a result of his performance.

As Cohen (1974) points out: "... the operational definition of intrinsic motivation as behavior which results in the attainment of internally mediated rewards from the task itself is justifiable not only from individuals concerned with industrial applications of psychological principles (Likert, Lawler, McGregor, Herzberg) but also from individuals who have sought to advance and clarify the concept of intrinsic motivation (Berlyn, Hunt, White, etc.)."
Intrinsic motivation was measured by Questionnaire B and the exact scoring procedure used will be described in the next chapter.

**Perceived Effort.**—Question A, item 6, asked subjects to indicate on a seven-point scale how much effort they felt they expended while working on the task.

**Performance.**—The performance index was represented by the sum total number of words each subject found while working on the final three embedded word problems.

**Task Satisfaction.**—Questionnaire C, constructed in a manner similar to the Job Description Index (Smith, Kendall and Hulin, 1969), was used to measure task satisfaction. The exact scoring procedure used for this measure will be described in the next chapter.

**Behavioral Intentions.**—Questions two, three, and four from Questionnaire E were designed to represent a behavioral measure of task interest (behavioral intentions as opposed to actual behavior). The scoring of this scale will be described in the next chapter.

**Background Data Form.**—The Background Data Form obtained data on age, sex, college year, and cumulative grade-point average. Race was omitted from the analysis due to the small sample of non-whites.

The remaining variables and scoring information along with the data analysis is included in the next chapter.
CHAPTER IV

RESULTS AND DISCUSSION

Overview of Results

Analysis of the data collected for Study I and Study II are presented in this section. The results for each study are presented separately. The first major set of analyses pertain to the internal consistency of several major constructs. After providing sufficient proof that these constructs were reliably measured, correlation and factor analyses of the variables obtained from each study are presented. Multiple Regression analyses represents the final data analytic step in order to predict several criteria of interest.

Study I Results

Manipulation Checks

Equity.--For experimental subjects only, correlations were obtained between the equity of the pay level (Questionnaire A, Item I, Questionnaire E, item 4) with the other variables. No significant correlations were obtained. Of particular importance, equity was unrelated to pay level, indicating that subjects did not perceive any differences in the equity of the reward, regardless of pay level. Thus, any differences which might occur in the behavior or attitudes of subjects across the pay levels was not a result of differences in perceptions of equity of reward. This finding supports the
effectiveness of the experimental instructions in attempting to induce equity.

Monetary Causal Attribution.—According to Deci (1971), individuals who receive extrinsic rewards for the performance should re-attribute their behavior to external sources. Accordingly, it may be reasonable that individuals in higher pay groups should perceive that the money they obtained for engaging in the task was a greater force in influencing their performance than subjects in the lower pay groups. Thus, one would expect a positive correlation between pay level and the monetary causal attribution factor. However, the correlation between these two variables was nonsignificant, a finding contrary to Deci's (1971) contention that pay levels influence self-attributions.

Results.—Table 1 lists the 19 variables obtained from the questionnaire data (located in Appendix A) and gives relevant coding information.

The next section describes the item and scale analysis along with the scoring procedures for five constructs: internal attributions; stable attributions; intrinsic motivation; task satisfaction; and a behavioroid measure of task interest.

Item and Scale Analysis

Internal Attributions.—Internal attributions refers to the extent that an individual believes that he, rather than some external factor, was the cause of his own performance. As such, it is similar
### TABLE 1

**Nineteen Variables Utilized in Study I**

(N=55)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Coding Information, Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pay Level</td>
<td>Coded as: 00=Control Group, 01=1¢, 05=5¢, 10=10¢, 15=15¢, and 20=20¢ pay group</td>
</tr>
<tr>
<td>2</td>
<td>Age</td>
<td>Coded in Years</td>
</tr>
<tr>
<td>3</td>
<td>Sex</td>
<td>Coded as Male=1, Female=2</td>
</tr>
<tr>
<td>4</td>
<td>College Year</td>
<td>Coded as Fr=1, So=2, Jr=3, Sr=4</td>
</tr>
<tr>
<td>5</td>
<td>Grade-Point Average</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Task Interest Item I</td>
<td>Questionnaire A-Item 2, reflected to indicate task interest (1=low, 7=high)</td>
</tr>
<tr>
<td>7</td>
<td>Performance-Reward Contingency Item I</td>
<td>Questionnaire A-Item 3 (1=low, 7=high)</td>
</tr>
<tr>
<td>8</td>
<td>Satisfaction with Task Performance</td>
<td>Questionnaire A-Item 4, reflected to indicate satisfaction (1=low, 7=high)</td>
</tr>
<tr>
<td>9</td>
<td>Performance Perceived as Successful</td>
<td>Questionnaire A-Item 5 (1=low, 7=high)</td>
</tr>
<tr>
<td>10</td>
<td>Performance-Reward Contingency Item II</td>
<td>Questionnaire E-Item 1 (1=low, 7=high)</td>
</tr>
<tr>
<td>Variable Number</td>
<td>Variable Name</td>
<td>Coding Information, Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11</td>
<td>Internal Attributions</td>
<td>Described in item analysis section (Derived from Questionnaire D)</td>
</tr>
<tr>
<td>12</td>
<td>Stable Attributions</td>
<td>Described in item analysis section (Derived from Questionnaire D)</td>
</tr>
<tr>
<td>13</td>
<td>Perceived Effort Expended</td>
<td>Questionnaire A-Item 6 (1=low, 7=high)</td>
</tr>
<tr>
<td>14</td>
<td>Task Interest Item II</td>
<td>Questionnaire A-Item 7 (1=low, 7=high)</td>
</tr>
<tr>
<td>15</td>
<td>Intrinsic Motivation</td>
<td>Described in item analysis section (Derived from Questionnaire B)</td>
</tr>
<tr>
<td>16</td>
<td>Task Satisfaction</td>
<td>Described in item analysis section (Derived from Questionnaire C)</td>
</tr>
<tr>
<td>17</td>
<td>Behavioroid Measure of Task Interest</td>
<td>Described in item analysis section (Derived from Questionnaire E)</td>
</tr>
<tr>
<td>18</td>
<td>Task Performance</td>
<td>Sum of performance on trials, 3, 4 and 5</td>
</tr>
<tr>
<td>19</td>
<td>Practice Performance</td>
<td>Sum of performance on problems 1, 2, and 3</td>
</tr>
</tbody>
</table>
to Rotter's (1966) internal-external control construct except that in this study, attributions were task specific.

Individuals were required to independently rate the contribution of four factors as they related to their previous task performance: luck; ability; difficulty of the task; and effort.

To indicate internal attributions, Ss' ability and effort scores were added together. Luck and task difficulty, representing external attributions, were both reflected (6 minus the score on each of these items), and added to the ability + effort score to form a composite score for each subject based on the four items.

Table 2 presents these four items, gives their means, standard deviations, item-test correlations (I-T r's), and Kuder-Richardson reliability #8 for the composite.

From an examination of Table 2, it may be noted that the task difficulty item had a somewhat low item-test correlation in relation to the other items in the scale. Eliminating this item from the scale raised the Kuder-Richardson reliability to .80 as indicated in Table 3. Thus, the final internal attribution scale included the three factors of luck, effort, and ability and was scored in the manner previously described.

Stable Attributions.—An individual makes stable attributions to the extent that he attributes his behavior to factors which are relatively fixed (e.g., ability and task difficulty) as opposed to factors which are variable (e.g., effort and luck).
TABLE 2
Means, Standard Deviations, Item-Test Correlations, and Kuder-Richardson Reliability for Original Internal Attribution Instrument for Study I Sample (N=55)

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luck*</td>
<td>3.29</td>
<td>.98</td>
<td>.66</td>
</tr>
<tr>
<td>Ability</td>
<td>3.33</td>
<td>.99</td>
<td>.70</td>
</tr>
<tr>
<td>Task Difficulty*</td>
<td>2.69</td>
<td>1.01</td>
<td>.37</td>
</tr>
<tr>
<td>Effort</td>
<td>4.00</td>
<td>.91</td>
<td>.63</td>
</tr>
</tbody>
</table>

K-R #8 = .66

*Items reflected (1=low, 5=high)

TABLE 3
Means, Standard Deviations, Item-Test Correlations, and Kuder-Richardson Reliability for Final Internal Attribution Instrument for Study I Sample (N=55)

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luck*</td>
<td>3.29</td>
<td>.98</td>
<td>.77</td>
</tr>
<tr>
<td>Ability</td>
<td>3.33</td>
<td>.99</td>
<td>.79</td>
</tr>
<tr>
<td>Effort</td>
<td>4.00</td>
<td>.91</td>
<td>.65</td>
</tr>
</tbody>
</table>

K-R #8 = .80

*Item reflected (1=low, 5=high)
To assess stable attributions for the respondents, an individual's ability and task difficulty scores were added together. Effort and luck, representing unstable attributions, were both reflected (6 minus the score on each of these items) and added to the ability and task difficulty score to form a stable attribution score for each subject.

Table 4 presents these four items, gives their means, standard deviations, item-test correlations, and Kuder-Richardson reliability #8 for the composite scale. It may be noted that the effort item with an item-test correlation of .25, was somewhat lower than the other items in the scale.

Table 5 presents the information contained in Table 4 after elimination of the effort item. This procedure raised the K-R #8 from .59 to .74, thus improving the internal consistency of this measure. Thus, an individual's score on this measure was the result of the following three items: luck, ability, and task difficulty.

**Intrinsic Motivation.**—Questionnaire B was designed to tap the construct of internally mediated rewards. To arrive at a total score for each subject, scores were summed across the 10 items.

This instrument had a Kuder-Richardson reliability of .96, supporting the contention that intrinsic rewards were reliably measured. The K-R #8, means, S.D.'s and I-T r's for this instrument may be found in Table 6.

**Task Satisfaction.**—Questionnaire C measured task satisfaction. Subjects were asked to respond to 18 adjectives and phrases in relation to the task. If they agreed with the item, they responded
### TABLE 4

Means, Standard Deviations, Item-Test Correlations, and Kuder-Richardson Reliability for Original Stable Attribution Instrument for Study I Sample (N=55)

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luck*</td>
<td>3.29</td>
<td>.98</td>
<td>.67</td>
</tr>
<tr>
<td>Ability</td>
<td>3.36</td>
<td>.98</td>
<td>.60</td>
</tr>
<tr>
<td>Task Difficulty</td>
<td>3.31</td>
<td>1.01</td>
<td>.60</td>
</tr>
<tr>
<td>Effort*</td>
<td>2.00</td>
<td>.91</td>
<td>.25</td>
</tr>
</tbody>
</table>

K.R #8 = .59

*Items reflected (1=low, 5=high)

### TABLE 5

Means, Standard Deviations, Item-Test Correlations, and Kuder-Richardson Reliability for Final Stable Attribution Instrument for Study I Sample (N=55)

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luck*</td>
<td>3.29</td>
<td>.98</td>
<td>.76</td>
</tr>
<tr>
<td>Ability</td>
<td>3.36</td>
<td>.98</td>
<td>.72</td>
</tr>
<tr>
<td>Task Difficulty</td>
<td>3.31</td>
<td>1.01</td>
<td>.58</td>
</tr>
</tbody>
</table>

K-R #8 = .74

*Item reflected (1=low, 5=high)
<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To what extent did you find the embedded word task as being important?</td>
<td>3.36</td>
<td>1.55</td>
<td>.66</td>
</tr>
<tr>
<td>2. To what extent did you find the embedded word task as being meaningful?</td>
<td>3.25</td>
<td>1.70</td>
<td>.73</td>
</tr>
<tr>
<td>3. To what extent did working on the embedded word task result in feelings of self-esteem for you?</td>
<td>3.96</td>
<td>1.79</td>
<td>.92</td>
</tr>
<tr>
<td>4. To what extent did working on the embedded word task result in feelings of accomplishment for you?</td>
<td>4.27</td>
<td>1.71</td>
<td>.93</td>
</tr>
<tr>
<td>5. To what extent did working on the embedded word task result in feelings of achievement for you?</td>
<td>4.13</td>
<td>1.67</td>
<td>.93</td>
</tr>
<tr>
<td>6. To what extent did you have to use your skill and ability in order to perform the embedded word task?</td>
<td>4.80</td>
<td>1.69</td>
<td>.76</td>
</tr>
<tr>
<td>7. To what extent did working on the embedded word task result in feelings of self-fulfillment for you?</td>
<td>3.67</td>
<td>1.61</td>
<td>.87</td>
</tr>
<tr>
<td>8. Your feeling of satisfaction resulting from working on the embedded word task.</td>
<td>3.93</td>
<td>1.67</td>
<td>.87</td>
</tr>
<tr>
<td>9. Your feelings of success on the embedded word task.</td>
<td>4.07</td>
<td>1.61</td>
<td>.85</td>
</tr>
<tr>
<td>10. The interest you felt from the embedded word task.</td>
<td>4.42</td>
<td>1.89</td>
<td>.75</td>
</tr>
</tbody>
</table>

K-R #8 = .96

*1=low, 7=high.
"Y," if they did not agree, they responded "N," if they were undecided they responded "?." If an individual responded with a "Y" to a favorable description, he received a score of +2 for the item. If he responded negatively to a favorable description, he received a score of 0 for that item. Favorable or "Y" responses to a negative descriptor represented a score of 0 whereas negative or "N" responses to a negative descriptor received a score of +2. Regardless of item favorability, "?" responses received a score weight of +1. All item scores were summed to form a total score for each subject.

Table 7 reports the means, S.D.'s, I-T r's, and Kuder-Richardson reliability \#8 for the task satisfaction instrument. Although a satisfactory K-R \#8 of .87 was obtained for this instrument, several items had rather low correlations with the test. On this basis, the following 6 items were eliminated from the scoring: "Respected," "Hot," "Useful," "On your feet," "Simple," and "Frustrating." The final task satisfaction scale with the new K-R \#8 and item-test correlations, means and standard deviations appear in Table 8. This procedure increased the reliability of the instrument from .87 to .91 and eliminated those items that did not appear to contribute toward scale homogeneity.

**Behavioroid Measure of Task Interest.** Questions 2, 3, and 5 from Questionnaire E were used to form a behavioroid measure of task interest. The questions required yes-no responses and were coded as yes=1, n=0. Thus, subjects' scores on this three item scale could range from 0 to 3.
<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fascinating</td>
<td>.85</td>
<td>.96</td>
<td>.61</td>
</tr>
<tr>
<td>Routine*</td>
<td>1.11</td>
<td>.97</td>
<td>.81</td>
</tr>
<tr>
<td>Satisfying</td>
<td>1.20</td>
<td>.88</td>
<td>.56</td>
</tr>
<tr>
<td>Boring*</td>
<td>1.45</td>
<td>.85</td>
<td>.75</td>
</tr>
<tr>
<td>Good</td>
<td>1.51</td>
<td>.81</td>
<td>.77</td>
</tr>
<tr>
<td>Creative</td>
<td>1.05</td>
<td>.94</td>
<td>.70</td>
</tr>
<tr>
<td>Respected</td>
<td>.80</td>
<td>.72</td>
<td>.30</td>
</tr>
<tr>
<td>Hot*</td>
<td>1.56</td>
<td>.53</td>
<td>.12</td>
</tr>
<tr>
<td>Pleasant</td>
<td>1.07</td>
<td>.91</td>
<td>.66</td>
</tr>
<tr>
<td>Useful</td>
<td>1.04</td>
<td>.85</td>
<td>.30</td>
</tr>
<tr>
<td>Tiresome*</td>
<td>.96</td>
<td>.99</td>
<td>.69</td>
</tr>
<tr>
<td>Healthful</td>
<td>.62</td>
<td>.75</td>
<td>.50</td>
</tr>
<tr>
<td>Challenging</td>
<td>1.76</td>
<td>.60</td>
<td>.48</td>
</tr>
<tr>
<td>On your feet*</td>
<td>1.18</td>
<td>.83</td>
<td>-.28</td>
</tr>
<tr>
<td>Simple*</td>
<td>1.51</td>
<td>.78</td>
<td>.18</td>
</tr>
<tr>
<td>Engless*</td>
<td>1.22</td>
<td>.95</td>
<td>.65</td>
</tr>
<tr>
<td>Frustrating*</td>
<td>.55</td>
<td>.85</td>
<td>.35</td>
</tr>
<tr>
<td>Gives sense of accomplishment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.27</td>
<td>.90</td>
<td>.68</td>
</tr>
</tbody>
</table>

K-R #8 = .87

*Items representing negative descriptors, where "Y" responses = 0, "N" responses = +2.
<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fascinating</td>
<td>.85</td>
<td>.96</td>
<td>.70</td>
</tr>
<tr>
<td>Routine*</td>
<td>1.11</td>
<td>.97</td>
<td>.85</td>
</tr>
<tr>
<td>Satisfying</td>
<td>1.20</td>
<td>.88</td>
<td>.55</td>
</tr>
<tr>
<td>Boring*</td>
<td>1.45</td>
<td>.85</td>
<td>.77</td>
</tr>
<tr>
<td>Good</td>
<td>1.51</td>
<td>.81</td>
<td>.77</td>
</tr>
<tr>
<td>Creative</td>
<td>1.05</td>
<td>.94</td>
<td>.70</td>
</tr>
<tr>
<td>Pleasant</td>
<td>1.07</td>
<td>.91</td>
<td>.68</td>
</tr>
<tr>
<td>Tiresome*</td>
<td>.96</td>
<td>.99</td>
<td>.73</td>
</tr>
<tr>
<td>Healthful</td>
<td>.62</td>
<td>.75</td>
<td>.51</td>
</tr>
<tr>
<td>Challenging</td>
<td>1.76</td>
<td>.60</td>
<td>.49</td>
</tr>
<tr>
<td>Endless*</td>
<td>1.22</td>
<td>.95</td>
<td>.64</td>
</tr>
<tr>
<td>Gives sense of accomplishment</td>
<td>1.27</td>
<td>.90</td>
<td>.68</td>
</tr>
</tbody>
</table>

K-R #8 = .91

*Items representing negative descriptors that were reflected (e.g., "Y" responses = 0, "N" responses = +2).
### TABLE 9

Means, Standard Deviations, Item-Test Correlations, and Kuder-Richardson Reliability for Behavioroid Measure of Task Interest Instrument for Study I Sample (N=55)

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would you recommend the embedded word task to somebody to try?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Yes = 1, No = 0)</td>
<td>.71</td>
<td>.45</td>
<td>.73</td>
</tr>
<tr>
<td>Would you be willing to return and perform the task over again</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>....? (Yes = 1, No = 0)</td>
<td>.36</td>
<td>.48</td>
<td>.74</td>
</tr>
<tr>
<td>Would you like a copy of the Embedded Word Problems?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Yes = 1, No = 0)</td>
<td>.44</td>
<td>.50</td>
<td>.85</td>
</tr>
</tbody>
</table>

K-R #8 = .84
Means, standard deviations, item-test correlations, and Kuder-Richardson #8 for this instrument are reported in Table 9. This scale had an excellent reliability of .84.

In summary, the results of the instrumentation analyses indicate that the constructs were reliably measured.

Tests of Hypotheses

Study I

Table 10 shows the intercorrelation matrix of the 19 variables obtained in study 1. The means and standard deviations for the same variables may be found in Table 11. Table 12 presents the factor analysis and subsequent hierarchical factor loadings of these variables.

Correlation Results

Some of the important findings summarized from the correlation matrix were:

(1) As pay levels increase, there tends to be a greater perception that performance on the task and rewards which follow, are

\[1\] The correlations for this and all subsequent matrices were calculated by an IBM 360 Computer at the Ohio State University Instruction and Research Computer Center utilizing the Wherry-Wherry Hierarchical Factor Analysis Program (Wherry, 1959; Wherry & Olivero, 1971).

\[2\] The Wherry-Wherry Hierarchical Factor Analysis Program (Wherry, 1959; Wherry & Olivero, 1971) was used for the factor analysis. The program involves a principal factor analysis with Multiple R squared values in the diagonals. After the number of factors was determined upon the basis of residual size, a minimum residual analysis was used to correct for erroneous communalities. A varimax rotation was then used as a basis for further hierarchical rotation.

The residuals after the clean up varied from -.12 to .15. On that basis it was decided that loadings of .20 or more could be considered as significant.
TABLE 10
Intercorrelations of 19 Variables
Obtained in Study I (N=55)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pay Level</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Age</td>
<td>14</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>3</td>
<td>Sex</td>
<td>15</td>
<td>-17</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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*Decimals omitted.*

- *p ≤ .05 when r ≥ .27;*
- *p ≤ .01 when r ≥ .35.*
### TABLE 11
Means and Standard Deviations of 19 Variables Utilized in Study I
Sample (N=55)

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<th>Var. No.</th>
<th>Variable Name</th>
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*The means on the task interest items indicate that the respondents found the task moderately interesting.*
TABLE 12
Hierarchical Factor Loadings of 19 Variables Obtained in Study I
(N=55)*

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*Decimals omitted. The variables have been arranged so as to maximally disclose simple structure.
associated, as evidenced by the significant correlation ($r = .35$, $p < .01$) between pay and performance-reward contingency item 1.

(2) The hypothesis that money decreases intrinsic motivation was not supported. An $r$ of .13 (ns) was obtained between pay and intrinsic motivation. In fact, pay was positively related to behavioroid task interest and task satisfaction as well ($r$'s in teens). Pay was not related to performance ($r = .11$, ns) as indicated by the similarity in mean performance for the no pay, 1¢, 5¢, 10¢, and 20¢ pay groups, respectively of: 17.2; 20.1; 22.8; 20.3; 18.0; and 17.3.

(3) There was no difference in intrinsic motivation of males versus females as evidenced by an $r = .07$ between sex and intrinsic motivation, and no difference on task performance based on sex.

(4) Grade-point average did not differ significantly across pay groups, did not correlate with task performance, but was negatively related to intrinsic motivation, task interest, task satisfaction, and behavioroid task interest.

(5) As expected, practice performance was the best single predictor of actual performance ($r = .63$, $p < .01$). 

(6) Those individuals who viewed their performance on the task as being successful tended to do well on practice ($r = .36$, $p < .01$) and actual task performance ($r = .41$, $p < .01$), experienced task satisfaction ($r = .34$, $p < .05$), and had positive behavioral intentions ($r = .38$, $p < .01$).

(7) Those individuals who attributed their performance to internal factors also tended to attribute it to stable factors as
well. Since causality is not implied, the reverse relationship is also true (those individuals, who attributed their performance to stable factors also tended to attribute it to internal factors as well). These individuals perceived themselves as expending greater effort on the task, were more satisfied, intrinsically motivated, and were better performers than those who attributed their performance to external and/or unstable factors.

(8) Those individuals who perceived themselves as expending more effort tended to experience greater task satisfaction, were more intrinsically motivated, tended to be better performers than those who perceived low effort expenditure.

(9) Those individuals who expressed high task interest were also intrinsically motivated, experienced greater task satisfaction, were better performers, and expressed higher effort expenditure than those with lower task interest.

(10) Those individuals who were intrinsically motivated on the task tended to be younger, low grade-point students, viewed their performance on the task as successful; attributed their performance to internal \( (r = .50, p < .01) \) and stable factors \( (r = .40, p < .01) \); were not differentiated by sex; perceived high effort expenditure on the task \( (r = .31, p < .05) \); high task satisfaction \( (r = .73, p < .01) \), behavioroid task interest \( (r = .55, p < .01) \), and were better performers \( (r = .29, p < .05) \) than those low in intrinsic motivation.
Finally, task performance was interrelated with effort, task interest item II, intrinsic motivation, and task satisfaction, indicating that task performance was related to, and may be predicted by the attitudinal and motivational variables.

In summary, correlational analysis did not support the contention that pay has a negative effect on intrinsic motivation. Further, the results supported the contention that perceptions of the adequacy of task performance, the kinds of attributions which are made concerning previous performance, and motivational and attitudinal variables are all related to task performance. Further, such demographic variables as age, and motivation-ability type variables as grade-point were negatively related to attitudes and motivation for this sample.

**Factor Analysis Results**

Factor analysis and subsequent hierarchical rotation resulted in the extraction of a higher order factor accompanied by 5 additional factors as depicted in Table 12. The communalities of the 19 variables ranged from .10 to 1.00.

It may be noted that the communality of .10 for the pay level variable supports the findings in the correlation matrix that pay did not interrelate with the other variables (except for its relation with performance-reward contingency item I which was previously pointed out).

---

3In order to determine if the obtained correlations between the pay level variable and the other 18 variables were underestimated due
A discussion of the 6 factors follows with an emphasis on relating the factor analysis findings directly back to the correlation matrix from which it was obtained.

It may be noted that by multiplying the loadings of any two variables across all 6 factors and then adding these six values together, the correlation coefficient between these two variables may be obtained.

**Higher Order Factor (H).**—The higher order factor had significant loadings on all the variables except for the following: pay; age; sex; college year; and performance reward contingency item II. Significant loadings on all the variables would have represented a general factor.

The negative loading on grade-point in conjunction with the generally high positive loadings on the attribution, motivation, attitudinal and performance variables signifies that for this factor, grade-point was inversely related to these latter variables.

**Factor 1: Dissatisfaction with Performance Attributed to Self.**—The highest loadings for Factor 1 were on the two attribution measures. Those individuals who attributed their performance to internal

to possible curvilinearity, plots of correlation scatterdiagrams were generated by PLOTRE (Wherry & Oliver, 1971), a computer program yielding up to 15 by 15 class scatterplots for selected variables to permit visual inspection of linearity or non-linearity and general score distribution.

Examination of the class scatterplots of the pay variable against the other 18 variables revealed no important differences on 17 of the variables as a result of pay classification (the one exception was performance-reward contingency item I), and that the obtained correlations between the pay variable and the other 18 were essentially linear in nature and not underestimated by the correlation coefficients obtained.
and/or stable factors (loadings of .58 and .88 on internal and stable attributions respectively) tended to be dissatisfied with their performance on the task (loading -.40 on satisfaction with performance). However, the positive loading on intrinsic motivation (.23) supports the finding in the correlation matrix that high internal and/or stable attributions are associated with high intrinsic motivation.

In summary, this factor seems to represent intrinsically motivated individuals who make internal and stable attributions concerning their previous performance, but who are at the same time, not entirely satisfied with their previous performance on the task. Individuals on this factor were neutral in terms of task performance.

Factor 2: Task Interest and Enjoyment.--The high positive loadings on task interest item I (.40) and task interest item II (.46) indicate that this is a factor representing task interest and enjoyment. The positive loadings on behavioroid task interest (.18) and task satisfaction (.18), although not significant, are in the right direction.

This factor seems to represent older students (loading of .44 on age and .36 on college year) who have a below average grade-point relative to others in the sample (-.28). They perceived that they exerted a good deal of effort on the embedded word task (.42) and, as previously stated, found the task interesting.

Factor 3: Intrinsic Task Motivation and Satisfaction. Factor 3, with significant loadings of .42 and .55 on intrinsic motivation and task satisfaction, respectively, along with .28 on task interest
item II and .35 on behavoroid interest, seems to indicate that this factor represents both intrinsic task motivation (as evidenced from both the intrinsic motivation and behavoroid loadings) and task satisfaction.

The factor seems to represent young (loading -.46 on age and -.44 on college year) female students (loading .25 on sex) with a below average grade-point (-.25), who nevertheless were intrinsically motivated, experienced task satisfaction, indicated positive intentions about the task, and performed about average on the task (-.04 on task performance) relative to the rest of the sample.

Factor 4: Task Performance.—The largest loadings on this factor occurred on practice performance (.54) and actual task performance (.72) thus contributing toward the naming of this factor. The high positive loadings on both of these variables confirms that they are highly interrelated.

Those individuals who performed well on the task tended to be the younger subjects in the sample (-.22 on age). This same finding may be found in the higher order factor with a -.14 loading on age accompanied by a .50 loading on task performance. An r of -.17 between age and task performance substantiates this conclusion.

Also of interest is the -.27 loading on pay, indicating that higher pay level subjects performed poorer than did low pay Ss on this factor. However, this inverse relationship between pay and task performance (r = -.11) was confirmed in the correlation matrix.
**Factor 5: Satisfaction with Performance.**—Factor 5 seems to represent the obverse of Factor 1. Factor 5 has significant loadings on grade-point (.29), performance-reward contingency item I (.22), satisfaction with performance (.80), and perceptions of having performed the task successfully (.49).

The highest loading occurred on satisfaction with performance, thus contributing toward the naming of this factor. At the same time, this factor seems to indicate that feelings of satisfaction with performance were accompanied by perceptions of having performed the task successfully.

One major distinction between this factor and Factor 1 is the absence of significant loadings on the two attribution measures, indicating that individuals on Factor 5 were neutral in terms of attributing their previous performance to internal or stable factors.

In summary, the six factors which were obtained from the hierarchical factor analysis represent a condensed version of the correlation matrix, but also demonstrated the unique variance of each factor in terms of its contribution toward explaining the total correlation matrix.

The next section describes multiple regression analyses which were conducted whereby designated variables were used to predict criteria of interest.

**Multiple Regression Analyses**

In the first set of analyses, the following 12 variables were designated as possible predictors: pay level; age, sex; college year;
grade-point average; task interest item I; performance-reward contingency item I; satisfaction with performance; perception of successful performance; performance-reward contingency item II, internal attributions; and stable attributions. Separate regression equations were generated to predict each of the following criteria: (1) perceived effort expended; (2) intrinsic motivation; (3) task satisfaction; (4) behavioral task interest; and (5) task performance.\(^4\)

Practice performance was omitted as a possible predictor in all the analyses because of its relatively high relationship with actual task performance \((r = .63, p < .01)\).

Tables 13, 14, 15, 16, and 17 present those variables (and the order of selection, from top to bottom) which were selected into the prediction battery for each of the five previously mentioned criteria. Along with the variables selected is the Multiple R obtained for the regression equation, the Shrunken R (Wherry's Shrunken R which is a population estimate free of sampling error, followed by Darlington's (1968) Shrunken R which is a sample estimate), the F for increase in the Multiple R as a result of the addition of the last variable.

\(^4\)Mulreg (Multiple Regression Routines, Wherry, 1975) was used to generate all regression equations. The program provides 3 alternate regression techniques for use depending upon the ratio of the number of variables to sample size. The Wherry Test Selection technique was utilized in these analyses; a stepwise multiple regression program which stops adding predictors to the test battery when the F for increase becomes less than 1. The output obtained is described above.
variable into the predictor battery, degrees of freedom, the Beta Weight (standardized regression weight) and Bee Weight (raw score regression weight) for each variable, T for the weights (for determining the statistical significance of each weight as determined by the degrees of freedom), and the A weight for the regression equation (the constant term).

Prediction of Self-Rated Effort

The following variables were selected into the regression equation to predict effort: task interest item I; age; internal attributions; stable attributions, and pay level. The Multiple R for the regression equation was .629.

It should be noted that the stable attribution measure acted as a suppressor variable in the regression equation to the internal attribution measure. That is, due to the high intercorrelation between the two attribution measures (r = .78, p < .01), the stable attribution measure, because of its lower validity with the criterion, received a negative regression weight whereas the internal attribution measure, due to its higher validity with the criterion, received a positive weight.

The following equation, derived through regression analysis, can be used to predict an individual's effort score:

\[0.312 \times \text{task interest item I score} + 0.147 \times \text{subject's age} + 0.296 \times \text{internal attribution score} - 0.191 \times \text{stable attribution score} - 0.033 \times \text{subject's pay condition, being either 0, 1, 5, 10, 15, or 20} + 0.074 = \text{Effort Score}\]
TABLE 13

Stepwise Multiple Regression Analysis Utilizing Variables 1 Through 12 as Predictors of Self-Rated Effort Expended on Embedded Work Task for Study I Sample (N = 55)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee Wt.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Task Interest Item I</td>
<td>.418</td>
<td>.312</td>
<td>3.551</td>
</tr>
<tr>
<td>2.</td>
<td>Age</td>
<td>.288</td>
<td>.147</td>
<td>2.531</td>
</tr>
<tr>
<td>11.</td>
<td>Internal Attributions</td>
<td>.498</td>
<td>.296</td>
<td>2.707</td>
</tr>
<tr>
<td>12.</td>
<td>Stable Attributions</td>
<td>-.310</td>
<td>-.191</td>
<td>-1.743</td>
</tr>
<tr>
<td>1.</td>
<td>Pay Level</td>
<td>-.185</td>
<td>-.033</td>
<td>-1.635</td>
</tr>
</tbody>
</table>

F for Increase = 2.673, DF = 5, 49

A Weight = .074, Mult. R = .629, Shrunken R = (.578, .501).
### TABLE 14

Stopwise Multiple Regression Analysis Utilizing Variables 1 Through 12 as Predictors of Intrinsic Motivation for Study I Sample (N = 55)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee Wt.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>Internal Attributions</td>
<td>.178</td>
<td>1.172</td>
<td>.972</td>
</tr>
<tr>
<td>2.</td>
<td>Age</td>
<td>-.322</td>
<td>-1.822</td>
<td>-3.024</td>
</tr>
<tr>
<td>6.</td>
<td>Task Interest Item I</td>
<td>.190</td>
<td>1.570</td>
<td>1.701</td>
</tr>
<tr>
<td>1.</td>
<td>Pay Level</td>
<td>.129</td>
<td>.252</td>
<td>1.219</td>
</tr>
<tr>
<td>12.</td>
<td>Stable Attributions</td>
<td>.173</td>
<td>1.185</td>
<td>1.001</td>
</tr>
</tbody>
</table>

F for Increase = 1.001, DF = 6, 48

A Weight = 31.027, Mult. R = .694, Shrunken R = (.646, .575)
### TABLE 15

Stepwise Multiple Regression Analysis Utilizing Variables 1 Through 12 as Predictors of Task Satisfaction for Study I Sample (N = 55)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee Wt.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Task Interest Item I</td>
<td>.475</td>
<td>2.009</td>
<td>4.400</td>
</tr>
<tr>
<td>4.</td>
<td>College Year</td>
<td>-.170</td>
<td>-2.130</td>
<td>-1.581</td>
</tr>
<tr>
<td>5.</td>
<td>Grade-Point</td>
<td>-1.93</td>
<td>-2.175</td>
<td>-1.858</td>
</tr>
<tr>
<td>3.</td>
<td>Sex</td>
<td>.158</td>
<td>2.828</td>
<td>1.561</td>
</tr>
<tr>
<td>12.</td>
<td>Stable Attributions</td>
<td>.161</td>
<td>.564</td>
<td>1.563</td>
</tr>
<tr>
<td>2.</td>
<td>Age</td>
<td>-.108</td>
<td>-.312</td>
<td>-1.033</td>
</tr>
</tbody>
</table>

F for Increase = 1.006, DF = 7, 47

A Weight = 5.051, Mult. R = .745, Shrunken R = (.699, .633)
### TABLE 16

Stepwise Multiple Regression Analysis Utilizing Variables 1 Through 12 as Predictors of Behavioroid Task Interest for Study I Sample (N = 55)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee Wt.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Task Interest Item I</td>
<td>.302</td>
<td>.198</td>
<td>2.406</td>
</tr>
<tr>
<td>5.</td>
<td>Grade-Point</td>
<td>-.254</td>
<td>-.444</td>
<td>-2.064</td>
</tr>
<tr>
<td>8.</td>
<td>Sat. with Performance</td>
<td>.265</td>
<td>.162</td>
<td>1.587</td>
</tr>
<tr>
<td>12.</td>
<td>Stable Attributions</td>
<td>.153</td>
<td>.083</td>
<td>1.236</td>
</tr>
<tr>
<td>4</td>
<td>College Year</td>
<td>-.132</td>
<td>-.257</td>
<td>-1.124</td>
</tr>
</tbody>
</table>

F for Increase = 1.262, DF = 6, 48

A Weight = 4.17, Mult. R = .616, Shrunken R = (.550, .446)
### Table 17

Stepwise Multiple Regression Analysis Utilizing Variables 1 Through 12 as Predictors of Task Performance for Study I Sample (N = 55)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee Wt.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pay Level</td>
<td>-.217</td>
<td>-.170</td>
<td>-1.726</td>
</tr>
<tr>
<td>7.</td>
<td>Perf-Rew Cont. Item I</td>
<td>.214</td>
<td>.583</td>
<td>1.654</td>
</tr>
</tbody>
</table>

F for Increase = 2.735, DF = 4, 50

A Weight = 9.457, Mult R = .556, Shrunken R = (.504, .423)
**Prediction of Intrinsic Motivation**

The 6 following variables were selected into the regression equation to predict intrinsic motivation: internal attributions; age; the perception of having performed the task successfully; task interest item I; subject pay level, and stable attributions. The Multiple R for the regression equation was .694.

The attribution measures were important in terms of their contribution toward the prediction of intrinsic motivation. This finding supports cognitive evaluation theory by linking self-perception processes to a behavioral construct.

However, after all the variables prior to the selection of the pay variable had been partialled out, pay was selected as a predictor and received a positive regression weight. The positive weight seems to be best explained by the positive correlation between pay and intrinsic motivation ($r = .13$, n.s.). This finding runs counter to cognitive evaluation theory's prediction that pay has adverse effects on an individual's intrinsic motivation.

The degree to which an individual perceived his performance on the task as being successful also influenced his intrinsic motivation level. Presumably, perceptions of successful performance may generate feelings of pride and accomplishment and thus help explain this linkage.

It should be noted that of all the predictors, only age received a negative regression weight. The negative weight may be
explained by the inverse relation between age and intrinsic motivation \((r = -0.38, p < .01)\).

In order to predict an individual's intrinsic motivation level, the following equation can be used:

\[
1.172 \text{ (internal attribution score)} - 1.822 \text{ (subject's age)} + 2.25 \text{ (performance perceived as successful score)} + 1.57 \text{ (task interest item I score)} + .252 \text{ (subject's pay level condition, being either 0, 1, 5, 10, 15, or 20)} + 1.185 \text{ (stable attribution score)} + 31.027.
\]

**Prediction of Task Satisfaction**

The 7 following variables were selected as the best predictor combination of task satisfaction: task interest item I; college year; grade-point; perception of performance being successful; sex; stable attributions, and age. The Multiple R for the regression equation was .745.

College year, grade-point, and age all received negative regression weights, a finding confirmed by the correlation and factor analysis results. Their inclusion in the regression equation points out the potential utility of using demographic and history variables as predictors of important criteria.

Sex received a positive regression weight, indicating that being female would result in a higher predicted task satisfaction score than being male.

Task interest item I was the best single predictor of task satisfaction (confirmed by an \(r = .60, p < .01\) between task interest item I and task satisfaction).
The following equation, derived through regression analysis, can be used to predict an individual's task satisfaction score:

\[
2.009 \times \text{task interest item I score} - 2.13 \times \text{college year; } 1 = \text{Freshman, } 2 = \text{Sophomore; } 3 = \text{Junior, } 4 = \text{Senior} \\
- 2.175 \times \text{grade-point average} + .732 \times \text{performance perceived as successful score} + 2.828 \times \text{sex; } 1 = \text{male; } 2 = \text{female} \\
+ .564 \times \text{stable attribution score} - .312 \times \text{(subject's age)} + 5.051.
\]

**Prediction of Behavioroid Task Interest**

The behavioroid measure, it will be recalled, consisted of 3 items, each with a yes-no response format asking the subject: if he would recommend the task to somebody to try; if he would be willing to return on another date and perform the task again for reliability purposes for no credit or pay; and if he would like to receive a copy of the task.

Six variables were selected into the regression equation to predict behavioroid task interest: task interest item I; the perception of having performed the task successfully; grade-point average; satisfaction with performance; stable attributions, and college year. The Multiple R for the regression equation was .417.

Task interest item I was the best single predictor of behavioroid task interest. The perception of successful task performance and satisfaction with performance also contributed toward the prediction. That is, the more an individual viewed himself as being a successful performer and the greater an individual's satisfaction with his performance, the larger the probability would be that he would recommend the task to somebody to try; return to perform the
task for no credit or pay; and like to receive a copy of the task.

Grade-point average, college year, and stable attributions were also selected as predictors of the criterion, the former two receiving negative regression weights.

In order to predict an individual's behavioroid task interest score, the following equation can be used:

\[ 0.198 \text{ (task interest item I score)} + 0.062 \text{ (performance perceived as successful score)} - 0.444 \text{ (grade-point average)} + 0.162 \text{ (satisfaction with performance score)} + 0.083 \text{ (stable attribution score)} - 0.257 \text{ (college year; 1 = Fr, 2 = So, 3 = Jr, 4 = Sr)} + 0.417. \]

**Prediction of Task Performance**

Four variables were selected into the regression equation to predict task performance: perception of successful task performance; task interest item I; pay level, and performance-reward contingency item I. The Multiple R for the regression equation was 0.556.

The single best predictor of task performance was an individual's perception of how well he did on the task. Apparently, an individual's perception of the adequacy of his performance was a realistic estimate of his actual performance. Task interest item I and performance-reward contingency item I also contributed toward the prediction of task performance.

Pay level was the only predictor to receive a negative weight in the regression equation. This finding is not surprising due to the negative relationship between pay and performance (r = 0.11, n.s.).
The following equation, derived through regression analysis, can be used to predict an individual's task performance score:

\[ 1.194 \text{ (performance perceived as successful score)} + 0.698 \text{ (task interest item I score)} - 0.170 \text{ (subject's pay level condition, being either 0, 1, 5, 10, 15, or 20)} + 583 \text{ (performance-reward contingency item I score)} + 9.457. \]

Finally, viewing task performance as the outcome variable, all variables in study I (except for practice performance) were entered into stepwise multiple regression analysis as possible predictors of the criterion of task performance.

Table 18 presents those variables which were selected into the regression equation, the Multiple R obtained, the two Shrunken R's, the F for increase, Beta and Bee Weights, T for the Weights, and the A Weight.

Of the 17 possible predictors, 6 were selected into the final regression equation to predict task performance: the perception of having performed the task successfully; perceived effort expended; age, college year; task satisfaction, and behavioroid task interest. The Multiple R for the regression equation was .605, slightly higher than that obtained when the possible number of predictors was limited to the first 12 variables.

Again, the single best predictor of task performance was an individual's perception of how well he did on the task. The inclusion of task satisfaction and behavioroid task interest into the prediction equation points out what was found in the correlation matrix and factor analysis section that attitudinal variables were significantly related to the performance measure.
**TABLE 18**

Stepwise Multiple Regression Analysis Utilizing Variables 1 Through 17 as Predictors of Task Performance for Study I Sample (N = 55)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee Wt.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>Effort</td>
<td>.160</td>
<td>.712</td>
<td>1.192</td>
</tr>
<tr>
<td>2.</td>
<td>Age</td>
<td>-.183</td>
<td>-.417</td>
<td>-1.406</td>
</tr>
<tr>
<td>4.</td>
<td>College Year</td>
<td>.233</td>
<td>2.298</td>
<td>1.869</td>
</tr>
<tr>
<td>16.</td>
<td>Task Satisfaction</td>
<td>.291</td>
<td>.228</td>
<td>1.169</td>
</tr>
<tr>
<td>17.</td>
<td>Behavioroid Interest</td>
<td>-.216</td>
<td>-1.093</td>
<td>-1.368</td>
</tr>
</tbody>
</table>

F for Increase = 1.872, DF = 6, 48

A Weight = 13.481, Mult R = .605, Shrunken R = (.535, .425)
Behavioroid task interest, due to its lower validity with the criterion, seems to have acted as a suppressor for the task satisfaction variable (which had a higher validity with the criterion).

Perceived effort expended and college year contributed toward the prediction of performance and received positive regression weights. Age received a negative weight, a finding explained by the negative correlation between age and performance ($r = -.17$, n.s.).

In order to predict an individual's task performance score, the following equation derived through regression analysis can be used:

$$1.375 \times \text{perception of successful task performance score} + .712 \times \text{effort score} - .417 \times \text{age} + 2.298 \times \text{college year; } 1 = \text{Fr, } 2 = \text{So, } 3 = \text{Jr, } 4 = \text{Sr} + .228 \times \text{task satisfaction score} - 1.093 \times \text{behavioroid task interest score} + 13.481.$$ 

Evidence Relating to Proposed Motivation Model

Figure 2 presents the correlations obtained among the variables measured in study I that pertain to the proposed motivation model outlined in Chapter 3.

Although it is not possible to test for causality among the variables, the static correlations provide an introductory test of the validity of the model.

There appears to be some evidence that attributions may influence intrinsic motivation as evidenced by the $r$ of .50 ($p < .01$) between internal attributions and intrinsic motivation, and an $r$ of .40 ($p < .01$) between stable attributions and intrinsic motivation. Additional evidence of this linkage was found in the multiple regression analysis where both attribution measures were selected as predictors of intrinsic motivation.
Figure 2.—Correlations Obtained for Proposed Motivation Model, Study 1 Sample (N=55).
The correlation of .34 (p < .05) between internal attributions and effort provides positive support for that proposed linkage. It will be recalled that the internal attribution measure was also selected as one of the variables in the regression equation to predict effort. There is less support for the stable attribution-effort relationship (r = .13, n.s.).

Effort and intrinsic motivation were both significantly related to performance (p < .05).

Of particular importance, support was found for the contention that intrinsic motivation is an important construct in terms of its empirical relationship with performance (p < .05).

Performance was related to task satisfaction (r = .35, p < .01). This finding is somewhat discrepant with some recent reviews on the performance-satisfaction relationship (Vroom, 1964). However, since rewards (e.g., pay) were contingent on performance for the majority of the sample, one might expect a significant performance-satisfaction relationship as predicted by expectancy theory (Porter and Lawler, 1968).

Task satisfaction was significantly related to intrinsic motivation (r = .73, p < .01). Since task satisfaction reflects the level of rewards an individual receives (both intrinsic and extrinsic), this might explain the high relationship obtained between these two variables.

Performance on the task was not, however, related to causal attributions made concerning past performance as evidenced by the
correlations of .12 and .11 in the feedback loop between performance and stable and internal attributions respectively.

It should be noted that the pay level variable was purposely not included in the model (Figure 2) due to its lack of statistical relation with all the other variables. Thus, it is not clear from the results of this study what role money plays, if any, in the proposed motivation model. It is clear, however, that pay did not have the predicted adverse effect on the perceptual and motivational variables as posited by cognitive evaluation theorists (Deci, 1971).

In summary, there appears to be some support for many of the linkages proposed in the motivation model. Better specification of the variables, improved measurement techniques and the implementation of causal designs will help provide additional evidence to test the validity of the model.

The next section presents the results and discussion for Study II.

**Study II Results**

The two equity items and the monetary causal attribution item were not related to any measures of interest. This replicates what was found in Study I and relates directly to the interpretation discussed in the manipulation check section.

Table 19 lists the 21 variables obtained in Study II and gives relevant coding information. It may be noted that two additional variables were included in this study; the Rotter (1966) internal-external locus of control questionnaire, and the I-E x Pay score for
### TABLE 19

Twenty-one Variables Utilized in Study II  
(N=114)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Coding Information, Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pay Level</td>
<td>Coded as: 00=Control Group, 05=5¢, 10=10¢ pay group</td>
</tr>
<tr>
<td>2</td>
<td>Rotter I-E Score</td>
<td>Described in item analysis section (Derived from Questionnaire F)</td>
</tr>
<tr>
<td>3</td>
<td>Pay Level x I-E Score</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Age</td>
<td>Coded in years</td>
</tr>
<tr>
<td>5</td>
<td>Sex</td>
<td>Coded as Male=1, Female=2</td>
</tr>
<tr>
<td>6</td>
<td>College Year</td>
<td>Coded as Fr=1, So=2, Jr=3, Sr=4</td>
</tr>
<tr>
<td>7</td>
<td>Grade-Point Average</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Task Interest Item I</td>
<td>Questionnaire A-Item 2, reflected to indicate task interest (1=low, 7=high)</td>
</tr>
<tr>
<td>9</td>
<td>Performance-Reward Contingency Item I</td>
<td>Questionnaire A-Item 3 (1=low, 7=high)</td>
</tr>
<tr>
<td>10</td>
<td>Satisfaction with Task Performance</td>
<td>Questionnaire A-Item 4, reflected to indicate satisfaction (1=low, 7=high)</td>
</tr>
<tr>
<td>11</td>
<td>Performance Perceived Successful</td>
<td>Questionnaire A-Item 5 (1=low, 7=high)</td>
</tr>
<tr>
<td>Variable Number</td>
<td>Variable Name</td>
<td>Coding Information, Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>12</td>
<td>Performance-Reward Contingency Item II</td>
<td>Questionnaire E-Item I (1=low, 7=high)</td>
</tr>
<tr>
<td>13</td>
<td>Internal Attributions</td>
<td>Described in item analysis section (Derived from Questionnaire D)</td>
</tr>
<tr>
<td>14</td>
<td>Stable Attributions</td>
<td>Described in item analysis section (Derived from Questionnaire D)</td>
</tr>
<tr>
<td>15</td>
<td>Perceived Effort Expended</td>
<td>Questionnaire A-Item 6 (1=low, 7=high)</td>
</tr>
<tr>
<td>16</td>
<td>Task Interest Item II</td>
<td>Questionnaire A-Item 7 (1=low, 7=high)</td>
</tr>
<tr>
<td>17</td>
<td>Intrinsic Motivation</td>
<td>Described in item analysis section (Derived from Questionnaire B)</td>
</tr>
<tr>
<td>18</td>
<td>Task Satisfaction</td>
<td>Described in item analysis section (Derived from Questionnaire C)</td>
</tr>
<tr>
<td>19</td>
<td>Behavioroid Measure of Task Interest</td>
<td>Described in item analysis section (Derived from Questionnaire E)</td>
</tr>
<tr>
<td>20</td>
<td>Task Performance</td>
<td>Sum of performance on trials 3, 4, and 5</td>
</tr>
<tr>
<td>21</td>
<td>Practice Performance</td>
<td>Sum of performance on problems 1, 2, and 3</td>
</tr>
</tbody>
</table>
each subject to test for possible moderator effects of locus of control on pay.

The next section describes the item and scale analysis along with the scoring procedures for the following constructs: internal attributions; stable attributions; intrinsic motivation; task satisfaction; behavioroid task interest; and the Rotter (1966) locus of control instrument.

**Item and Scale Analysis**

**Internal Attributions.**—Identical scoring procedures and items used for the final internal attribution measure for Study I were also utilized in this study.

Table 20 presents these three items, gives their means, standard deviations, item-test correlations (I-T r's) and Kuder-Richardson reliability #8 for the composite scale. A satisfactory K-R #8 of .71 was obtained for this three item instrument.

**Stable Attributions.**—The stable attribution measure utilized in Study II contained the three items used in the previous study and was scored in the same manner.

Table 21 presents these items along with their means, standard deviations, item-test correlations and Kuder-Richardson reliability #8 for the composite scale. The K-R #8 obtained was .63 for this measure.

**Intrinsic Motivation.**—The scoring procedure and items included in this instrument were identical to those in Study I.
### TABLE 20

Means, Standard Deviations, Item-Test Correlations, and Kuder-Richardson Reliability for Internal Attribution Instrument for Study II Sample (N=114)

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luck*</td>
<td>3.79</td>
<td>.96</td>
<td>.65</td>
</tr>
<tr>
<td>Ability</td>
<td>3.57</td>
<td>.91</td>
<td>.70</td>
</tr>
<tr>
<td>Effort</td>
<td>3.89</td>
<td>.84</td>
<td>.66</td>
</tr>
</tbody>
</table>

K-R #8 = .71

*Item reflected (1=low, 5=high).

### TABLE 21

Means, Standard Deviations, Item-Test Correlations, and Kuder-Richardson Reliability for Stable Attribution Instrument for Study II Sample (N=114)

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luck*</td>
<td>3.81</td>
<td>.94</td>
<td>.57</td>
</tr>
<tr>
<td>Ability</td>
<td>3.57</td>
<td>.91</td>
<td>.65</td>
</tr>
<tr>
<td>Task Difficulty</td>
<td>3.25</td>
<td>1.00</td>
<td>.61</td>
</tr>
</tbody>
</table>

K-R #8 = .63

*Item reflected (1=low, 5=high).
The means, standard deviations, I-T r's and K-R #8 for this instrument may be found in Table 22. The K-R #8 for this scale was .96, supporting the contention that this construct was reliably measured. The results of the factor analysis presented later in this chapter, indicate that while this construct appears to be interrelated with many of the others (loading of .67 on the higher order factor), it also possesses discriminant validity in items of having its major loading on only one factor, h3 (.40).

**Task Satisfaction.**—The scoring procedure and items included in this instrument were identical to those found in Study I.

The relevant information pertaining to this construct may be found in Table 23. A K-R #8 of .85 was obtained for this instrument.

**Behavioroid Measure of Task Interest.**—This measure included the same items and scoring procedures as in Study I.

Means, standard deviations, item-test correlations, and Kuder-Richardson #8 for this instrument are reported in Table 24. This three item scale had an excellent reliability of .80.

**Rotter's (1966) Internal-External Locus of Control Measure.**—The Rotter (1966) locus of control questionnaire (Questionnaire F) consists of 29 forced choice items, 6 of which are fillers designed to help disguise the nature of the instrument.

Each item has an internal paired with an external statement. Subjects were required to choose the statement which they personally believed to be more true for each of the items.

Internal statements received a score weight of 0, whereas external alternatives chosen received a weight of +1. Thus, an
**TABLE 22**

Means, Standard Deviations, Item-Test Correlations, and Kuder-Richardson Reliability for Intrinsic Motivation Instrument for Study II Sample (N=114)*

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To what extent did you find the embedded word task as being important?</td>
<td>3.75</td>
<td>1.67</td>
<td>.76</td>
</tr>
<tr>
<td>2. To what extent did you find the embedded word task as being meaningful?</td>
<td>3.61</td>
<td>1.76</td>
<td>.79</td>
</tr>
<tr>
<td>3. To what extent did working on the embedded word task result in feelings of self-esteem for you?</td>
<td>4.02</td>
<td>1.82</td>
<td>.88</td>
</tr>
<tr>
<td>4. To what extent did working on the embedded word task result in feelings of accomplishment for you?</td>
<td>4.11</td>
<td>1.83</td>
<td>.89</td>
</tr>
<tr>
<td>5. To what extent did working on the embedded word task result in feelings of achievement for you?</td>
<td>4.14</td>
<td>1.82</td>
<td>.88</td>
</tr>
<tr>
<td>6. To what extent did you have to use your skill and ability in order to perform the embedded word task?</td>
<td>4.89</td>
<td>1.37</td>
<td>.66</td>
</tr>
<tr>
<td>7. To what extent did working on the embedded word task result in feelings of self-fulfillment for you?</td>
<td>3.72</td>
<td>1.72</td>
<td>.89</td>
</tr>
<tr>
<td>8. Your feeling of satisfaction resulting from working on the embedded word task.</td>
<td>4.04</td>
<td>1.68</td>
<td>.88</td>
</tr>
<tr>
<td>9. Your feelings of success on the embedded word task.</td>
<td>4.10</td>
<td>1.68</td>
<td>.83</td>
</tr>
<tr>
<td>10. The interest you felt from the embedded word task.</td>
<td>4.56</td>
<td>1.69</td>
<td>.76</td>
</tr>
</tbody>
</table>

K-R #8 = .96

*1=low, 7=high.
### TABLE 23

Means, Standard Deviations, Item-Test Correlations and Kuder-Richardson Reliability for Task Satisfaction Instrument for Study II Sample (N=114)

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fascinating</td>
<td>.76</td>
<td>.93</td>
<td>.52</td>
</tr>
<tr>
<td>Routine*</td>
<td>1.16</td>
<td>.94</td>
<td>.59</td>
</tr>
<tr>
<td>Satisfying</td>
<td>1.21</td>
<td>.93</td>
<td>.71</td>
</tr>
<tr>
<td>Boring*</td>
<td>1.60</td>
<td>.73</td>
<td>.59</td>
</tr>
<tr>
<td>Good</td>
<td>1.50</td>
<td>.75</td>
<td>.66</td>
</tr>
<tr>
<td>Creative</td>
<td>1.15</td>
<td>.92</td>
<td>.44</td>
</tr>
<tr>
<td>Pleasant</td>
<td>1.35</td>
<td>.87</td>
<td>.63</td>
</tr>
<tr>
<td>Tiresome*</td>
<td>.99</td>
<td>.96</td>
<td>.57</td>
</tr>
<tr>
<td>Healthful</td>
<td>.59</td>
<td>.75</td>
<td>.48</td>
</tr>
<tr>
<td>Challenging</td>
<td>1.83</td>
<td>.51</td>
<td>.46</td>
</tr>
<tr>
<td>Endless*</td>
<td>1.39</td>
<td>.87</td>
<td>.53</td>
</tr>
<tr>
<td>Gives sense of accomplishment</td>
<td>1.38</td>
<td>.87</td>
<td>.69</td>
</tr>
</tbody>
</table>

K=R #8 = .85

*Items representing negative descriptors which were reflected ("N"=0, "?"=1, and "Y"=2).
<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would you recommend the embedded word task to somebody to try? (Yes=1, No=0)</td>
<td>.80</td>
<td>.40</td>
<td>.66</td>
</tr>
<tr>
<td>Would you be willing to return and perform the task over again ...? (Yes=1, No=0)</td>
<td>.23</td>
<td>.42</td>
<td>.72</td>
</tr>
<tr>
<td>Would you like a copy of the Embedded Word Problems? (Yes=1, No=0)</td>
<td>.42</td>
<td>.49</td>
<td>.80</td>
</tr>
</tbody>
</table>

K-R #8 = .80
individual's score could range from 0 to 23, with higher scores representing increasing external beliefs.

The means, standard deviations, and item-test correlations for the 23 external items are reported in Table 25. The Kuder-Richardson reliability for this instrument was .78.

In summary, the results of the instrumentation analyses indicate that the constructs were reliably measured.

Tests of Hypotheses

Study II

Table 26 presents the intercorrelation matrix for the 21 variables obtained in Study II. The means and standard deviations for the same variables may be found in Table 27. Table 28 presents the factor analysis and subsequent hierarchical factor loadings of the variables.\(^5\)

Correlation Results

The results of the correlational and factor analysis replicated, to a large extent, what was found in Study I. This is, pay was generally unrelated to the other variables in the matrix, and the perceptual, attitudinal and performance variables tended to be

\(^5\)The Wherry-Wherry Hierarchical Factor Analysis Program (Wherry, 1959; Wherry & Olivero, 1971) was used for the factor analysis. The residuals after the clean up varied from -.16 to .15. On that basis it was decided that loadings of .20 or more could be considered as significant.
<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>S.D.</th>
<th>I-T r</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Many of the unhappy things in people's lives are partly due to bad luck.</td>
<td>.25</td>
<td>.43</td>
<td>.45</td>
</tr>
<tr>
<td>2. There will always be wars no matter how hard people try to prevent them.</td>
<td>.63</td>
<td>.48</td>
<td>.31</td>
</tr>
<tr>
<td>3. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.</td>
<td>.63</td>
<td>.48</td>
<td>.35</td>
</tr>
<tr>
<td>4. Most students do not realize the extent to which their grades are influenced by accidental happenings.</td>
<td>.60</td>
<td>.49</td>
<td>.43</td>
</tr>
<tr>
<td>5. Without the right breaks one cannot be an effective leader.</td>
<td>.21</td>
<td>.41</td>
<td>.48</td>
</tr>
<tr>
<td>6. No matter how hard you try, some people just don't like you.</td>
<td>.61</td>
<td>.49</td>
<td>.35</td>
</tr>
<tr>
<td>7. I have often found that what is going to happen will happen.</td>
<td>.23</td>
<td>.42</td>
<td>.37</td>
</tr>
<tr>
<td>8. Many times exam questions tend to be so unrelated to the course work that studying is really useless.</td>
<td>.47</td>
<td>.50</td>
<td>.55</td>
</tr>
<tr>
<td>9. Getting a good job depends mainly on being in the right place at the right time.</td>
<td>.40</td>
<td>.49</td>
<td>.50</td>
</tr>
<tr>
<td>10. This world is run by the few people in power, and there is not much the little guy can do about it.</td>
<td>.37</td>
<td>.48</td>
<td>.25</td>
</tr>
<tr>
<td>11. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.</td>
<td>.31</td>
<td>.46</td>
<td>.34</td>
</tr>
<tr>
<td>Items</td>
<td>Mean</td>
<td>S.D.</td>
<td>I-T r</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>12. Many times we might just as well decide what to do by flipping a coin.</td>
<td>.19</td>
<td>.36</td>
<td>.42</td>
</tr>
<tr>
<td>13. Who gets to be the boss often depends on who was lucky enough to be in the right place first.</td>
<td>.18</td>
<td>.38</td>
<td>.50</td>
</tr>
<tr>
<td>14. As far as world affairs are concerned, most of us are the victim of force we can neither understand nor control.</td>
<td>.36</td>
<td>.48</td>
<td>.39</td>
</tr>
<tr>
<td>15. Most people don't realize the extent to which their lives are controlled by accidental happenings.</td>
<td>.70</td>
<td>.46</td>
<td>.49</td>
</tr>
<tr>
<td>16. It is hard to know whether or not a person really likes you.</td>
<td>.61</td>
<td>.49</td>
<td>.26</td>
</tr>
<tr>
<td>17. In the long run the bad things that happen to us are balanced by the good ones.</td>
<td>.68</td>
<td>.47</td>
<td>.33</td>
</tr>
<tr>
<td>18. It is difficult for people to have much control over the things politicians do in office.</td>
<td>.40</td>
<td>.49</td>
<td>.29</td>
</tr>
<tr>
<td>19. Sometimes I cannot understand how teachers arrive at the grades they give.</td>
<td>.21</td>
<td>.41</td>
<td>.48</td>
</tr>
<tr>
<td>20. Many times I feel that I have little influence over the things that happen to me.</td>
<td>.40</td>
<td>.49</td>
<td>.49</td>
</tr>
<tr>
<td>21. There's not much use in trying too hard to please people, if they like you, they like you.</td>
<td>.41</td>
<td>.49</td>
<td>.32</td>
</tr>
<tr>
<td>22. Sometimes I feel that I don't have enough control over the direction my life is taking.</td>
<td>.26</td>
<td>.44</td>
<td>.56</td>
</tr>
<tr>
<td>Items</td>
<td>Mean</td>
<td>S.D.</td>
<td>I-T r</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>23. Most of the time I can't understand why politicians behave</td>
<td>.37</td>
<td>.48</td>
<td>.33</td>
</tr>
<tr>
<td>the way they do.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

K-R #8 = .78
| Variable Number | Variable Name                      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|-----------------|-----------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1.              | Pay Level                         | 100|   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 2.              | Locus of Control                  | 16 | 100|   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3.              | Locus of Control x Pay            | 80 | 32 | 100|   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 4.              | Age                               | 14 | -03| 11 | 100|   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 5.              | Sex                               | -12| 04 | 13 | -16| 100|   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 6.              | College Year                      | 13 | -12| -07| 33 | -27| 100|   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 7.              | Grade Point                       | 19 | -03| 19 | 06 | 08 | -02| 100|   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8.              | Task Interest Item I              | 01 | -13| -06| 05 | 15 | -12| 07 | 100|   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9.              | Perf-Rew Cont Item I              | 23 | -14| 13 | 03 | -03| 05 | -05| 100|   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10.             | Sat. with Performance             | 01 | -09| 00 | -11| 17 | -22| 13 | 31 | 04 | 100|   |    |    |    |    |    |    |    |    |    |    |    |    |
| 11.             | Perf Perceived Succ.              | 02 | -05| 02 | -01| 15 | -08| 10 | 36 | 08 | 64 | 100|   |    |    |    |    |    |    |    |    |    |    |    |
| 12.             | Perf-Rew Cont. Item II            | 16 | -17| 11 | -10| -09| 14 | 05 | 31 | 10 | 17 | 100|   |    |    |    |    |    |    |    |    |    |    |    |
| 13.             | Internal Attributions             | 07 | -22| -10| -13| 00 | -09| 10 | 16 | 11 | 30 | 27 | 10 | 100|   |    |    |    |    |    |    |    |    |    |
| 14.             | Stable Attributions               | -10| -19| -23| -12| -05| -03| 06 | 18 | 03 | 23 | 16 | 10 | 70 | 100|   |    |    |    |    |    |    |    |    |
| 15.             | Effort                            | 02 | -05| -01| 16 | 03 | -04| 06 | 05 | 21 | 11 | 23 | 01 | 19 | 04 | 100|   |    |    |    |    |    |    |    |
| 16.             | Task Interest Item II             | 06 | -04| -02| 00 | 08 | -01| -06| 44 | 03 | 25 | 46 | 27 | 21 | 13 | 42 | 100|   |    |    |    |    |    |    |
| 17.             | Intrinsic Motivation              | 08 | -11| -01| -12| 00 | -06| 00 | 41 | 11 | 32 | 44 | 30 | 45 | 25 | 39 | 65 | 100|   |    |    |    |    |
| 18.             | Task Satisfaction                 | 09 | -08| -01| -08| 12 | -02| 03 | 49 | 05 | 25 | 42 | 25 | 35 | 17 | 24 | 68 | 69 | 100|   |    |    |    |
| 19.             | Behaviorist Interest              | 05 | -30| -08| -04| 14 | -01| -04| 30 | 00 | 02 | 12 | 19 | 17 | 07 | 30 | 52 | 46 | 51 | 100|   |    |    |    |
| 20.             | Task Performance                  | 10 | -02| 05 | -04| 15 | -09| 24 | 37 | 07 | 47 | 57 | 25 | 25 | 07 | 14 | 45 | 47 | 41 | 24 | 100|   |    |    |
| 21.             | Practice Performance              | 10 | -05| 02 | 00 | 11 | -01| 17 | 30 | -05| 32 | 44 | 13 | 28 | 08 | 23 | 45 | 35 | 36 | 22 | 67 | 100|   |    |    |

*Decimals omitted
p<.05 when r>.19
p<.01 when r>.24
## TABLE 27

Means and Standard Deviations of 21 Variables Utilized in Study II Sample (N=114)

<table>
<thead>
<tr>
<th>Var. No.</th>
<th>Variable Name</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pay Level</td>
<td>4.87</td>
<td>4.18</td>
</tr>
<tr>
<td>2.</td>
<td>Locus of Control (I-E)</td>
<td>9.49</td>
<td>4.24</td>
</tr>
<tr>
<td>3.</td>
<td>I-E x Pay Level</td>
<td>43.46</td>
<td>45.29</td>
</tr>
<tr>
<td>4.</td>
<td>Age</td>
<td>19.18</td>
<td>2.44</td>
</tr>
<tr>
<td>5.</td>
<td>Sex</td>
<td>1.75</td>
<td>.43</td>
</tr>
<tr>
<td>6.</td>
<td>College Year</td>
<td>1.21</td>
<td>.47</td>
</tr>
<tr>
<td>7.</td>
<td>Grade-Point Average</td>
<td>2.81</td>
<td>.55</td>
</tr>
<tr>
<td>8.</td>
<td>Task Interest Item I*</td>
<td>5.07</td>
<td>1.82</td>
</tr>
<tr>
<td>9.</td>
<td>Perf-Rew Cont. Item I</td>
<td>4.64</td>
<td>1.99</td>
</tr>
<tr>
<td>10.</td>
<td>Satisfaction/Performance</td>
<td>4.03</td>
<td>2.03</td>
</tr>
<tr>
<td>11.</td>
<td>Performance/Successful</td>
<td>4.07</td>
<td>1.79</td>
</tr>
<tr>
<td>12.</td>
<td>Perf-Rew Cont. Item II</td>
<td>4.54</td>
<td>1.97</td>
</tr>
<tr>
<td>13.</td>
<td>Internal Attributions</td>
<td>11.25</td>
<td>1.81</td>
</tr>
<tr>
<td>14.</td>
<td>Stable Attributions</td>
<td>10.62</td>
<td>1.75</td>
</tr>
<tr>
<td>15.</td>
<td>Effort Expended</td>
<td>5.43</td>
<td>1.23</td>
</tr>
<tr>
<td>16.</td>
<td>Task Interest Item II*</td>
<td>4.96</td>
<td>1.66</td>
</tr>
<tr>
<td>17.</td>
<td>Intrinsic Motivation</td>
<td>40.93</td>
<td>14.15</td>
</tr>
<tr>
<td>18.</td>
<td>Task Satisfaction</td>
<td>14.90</td>
<td>5.84</td>
</tr>
<tr>
<td>19.</td>
<td>Behavioroid Task Interest</td>
<td>1.45</td>
<td>.97</td>
</tr>
<tr>
<td>20.</td>
<td>Task Performance</td>
<td>19.74</td>
<td>6.34</td>
</tr>
</tbody>
</table>

*The means on the task interest items indicate that the respondents found the task moderately interesting.*
<table>
<thead>
<tr>
<th>Variable/Factor</th>
<th>H.</th>
<th>h1.</th>
<th>h2.</th>
<th>h3.</th>
<th>B.</th>
<th>C.</th>
<th>h²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pay Level</td>
<td>06</td>
<td>08</td>
<td>02</td>
<td>-02</td>
<td>85</td>
<td>-08</td>
<td>74</td>
</tr>
<tr>
<td>3. Locus of Control x Pay</td>
<td>-05</td>
<td>-16</td>
<td>08</td>
<td>-13</td>
<td>96</td>
<td>16</td>
<td>100</td>
</tr>
<tr>
<td>9. Perf-Rew Cont I</td>
<td>07</td>
<td>14</td>
<td>-08</td>
<td>05</td>
<td>23</td>
<td>-03</td>
<td>09</td>
</tr>
<tr>
<td>4. Age</td>
<td>-04</td>
<td>-08</td>
<td>08</td>
<td>02</td>
<td>16</td>
<td>-49</td>
<td>28</td>
</tr>
<tr>
<td>5. Sex</td>
<td>15</td>
<td>12</td>
<td>14</td>
<td>00</td>
<td>-17</td>
<td>26</td>
<td>15</td>
</tr>
<tr>
<td>6. College Year</td>
<td>-09</td>
<td>04</td>
<td>-04</td>
<td>07</td>
<td>10</td>
<td>-67</td>
<td>48</td>
</tr>
<tr>
<td>13. Int. Attribution</td>
<td>37</td>
<td>77</td>
<td>-06</td>
<td>00</td>
<td>00</td>
<td>11</td>
<td>75</td>
</tr>
<tr>
<td>14. Stable Attrib.</td>
<td>21</td>
<td>73</td>
<td>-11</td>
<td>-04</td>
<td>-16</td>
<td>08</td>
<td>62</td>
</tr>
<tr>
<td>10. Sat/Performance</td>
<td>45</td>
<td>22</td>
<td>43</td>
<td>-13</td>
<td>-04</td>
<td>22</td>
<td>50</td>
</tr>
<tr>
<td>2. Locus of Control</td>
<td>-14</td>
<td>-28</td>
<td>13</td>
<td>-13</td>
<td>05</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>7. Grade-Point</td>
<td>10</td>
<td>09</td>
<td>21</td>
<td>-14</td>
<td>18</td>
<td>00</td>
<td>11</td>
</tr>
<tr>
<td>21. Practice Perf.</td>
<td>55</td>
<td>05</td>
<td>39</td>
<td>07</td>
<td>06</td>
<td>-05</td>
<td>46</td>
</tr>
<tr>
<td>11. Perf/Successful</td>
<td>60</td>
<td>12</td>
<td>46</td>
<td>01</td>
<td>01</td>
<td>06</td>
<td>59</td>
</tr>
<tr>
<td>20. Performance</td>
<td>63</td>
<td>04</td>
<td>49</td>
<td>04</td>
<td>09</td>
<td>06</td>
<td>65</td>
</tr>
<tr>
<td>8. Task Interest I</td>
<td>49</td>
<td>04</td>
<td>13</td>
<td>21</td>
<td>-03</td>
<td>11</td>
<td>32</td>
</tr>
<tr>
<td>15. Effort Expended</td>
<td>32</td>
<td>04</td>
<td>00</td>
<td>23</td>
<td>05</td>
<td>-10</td>
<td>17</td>
</tr>
<tr>
<td>16. Task Interest II</td>
<td>70</td>
<td>-06</td>
<td>03</td>
<td>48</td>
<td>05</td>
<td>00</td>
<td>73</td>
</tr>
<tr>
<td>17. Int. Motivation</td>
<td>67</td>
<td>20</td>
<td>-04</td>
<td>40</td>
<td>08</td>
<td>11</td>
<td>67</td>
</tr>
<tr>
<td>18. Task Satisfaction</td>
<td>66</td>
<td>07</td>
<td>-02</td>
<td>43</td>
<td>06</td>
<td>10</td>
<td>64</td>
</tr>
<tr>
<td>19. Behavioroid Int.</td>
<td>45</td>
<td>-01</td>
<td>-21</td>
<td>48</td>
<td>00</td>
<td>00</td>
<td>48</td>
</tr>
<tr>
<td>12. Perf-Rew Cont II</td>
<td>28</td>
<td>10</td>
<td>-06</td>
<td>16</td>
<td>19</td>
<td>15</td>
<td>18</td>
</tr>
</tbody>
</table>

*Decimals omitted. The variables have been arranged so as to maximally disclose simple structure.
interrelated. Some specific findings were:

(1) The hypothesis that pay negates intrinsic motivation was not supported \((r = .08, \text{n.s.})\). In addition, pay was not related to task performance \((r = .10, \text{n.s.})\) as indicated by the similarity in mean performance for the no pay, 5c, and 10c pay groups, respectively, of: 19.1; 19.4; and 20.7.

(2) Rotter's (1966) external locus of control measure was generally unrelated to the dependent variables with the exception of behavioroid task interest \((r = -.30, p < .01)\).

(3) There was a positive correlation between grade-point average and task performance \((r = .24, p < .01)\).

(4) As previously indicated, the perceptual, attitudinal and performance variables tended to be interrelated. Intrinsic motivation was significantly related to task performance \((r = .35, p < .01)\).

(5) Rotter's (1966) locus of control measure was not related to intrinsic motivation. However, task specific causal attributions were significantly related to this construct. This finding suggests that the inclusion of causal factors directly related to previous task performance may have greater utility in explaining and predicting work behavior than generalized beliefs which are not necessarily task specific.

\[\text{PLOTRE (Wherry & Olivero, 1971) was run to detect possible curvilinearity between the pay variable and the other 20 variables. No curvilinearity was detected thus confirming that the linear r's obtained represented an accurate estimate of the degree of relationship between the pay variable and the other 20 variables.}\]
Factor Analysis Results

Factor analysis and subsequent hierarchical rotation resulted in the extraction of 6 factors. The communalities of the 21 variables ranged from .09 to 1.00.

It may be noted that the communality of .74 for the pay level variable was due primarily to the correlation between pay and locus of control x pay (r = .80, p < .01).

Higher Order Factor H.—This factor corresponds to the higher order factor found in Study I, with significant loadings on most of the variables. The relatively high loadings on the perceptual, attitudinal and performance variables confirms that these variables are interrelated. Factors h1, h2 and h3 each represent portions of the higher order factor and further explain and refine the interrelationships among these three sets of variables.

Factor H1: Internal and Stable Causal Attributions.—The highest loadings for Factor h1 occurred on the two causal attribution measures, thus contributing toward the naming of this factor. A positive loading of .22 on satisfaction with performance and .20 on intrinsic motivation indicates that individuals who made these kinds of attributions also tended to be intrinsically motivated on the task and satisfied to some extent, with their previous level of performance. They also tended to possess a general belief of internal control (−.28 on external control). Individuals on this factor tended to be average performers relative to the rest of the sample.

Factor h2: Perception of and Realization of Successful Performance.—Factor h2 seems to represent those individuals who perceived
that they performed the task successfully and who in fact were high
performers. In addition, these individuals were also satisfied with
their previous level of performance (.43).

The loading of .21 on grade-point confirms the finding in the
correlation matrix that grade-point was positively related to both
practice and actual task performance.

The only other significant loading occurred on behavioroid task
interest (-.21). The negative loading may be explained by the fact
that individuals who performed well on the task saw no further need to
return and perform the task over again. These individuals had
apparently experienced closure.

Factor h3: Intrinsic Task Motivation and Satisfaction.---This
factor had high loadings on the motivational and attitudinal vari­
ables. Individuals represented by this factor expressed interest in
the task (.21 loading on task interest item I, .48 loading on task
interest item II), were intrinsically motivated (.40), experienced
task satisfaction (.43), expressed positive behavioral intentions
(.48) and perceived above average effort expenditure on the task
(.23). All other variables were neutral on this factor.

Factor B: Pay.---This factor resulted primarily from the high
intercorrelation between the pay and pay x locus of control variable.

It can be readily seen that this was the only factor on which
the pay locus of control x pay variable had significant loadings.

Factor C: Young Female Students.---The loadings of -.49 on age
and -.67 on college year substantiate that this factor represents
the younger students in the sample.
The loading of .26 on sex indicates that this factor is more applicable to females than males. These individuals were average performers but were nevertheless somewhat satisfied with their previous level of performance (.22). All other variables were nonsignificant on this factor.

Summary of Factor Analysis

In summary, Factor H represented a higher order factor on which most of the variables had significant loadings. Subsumed under this factor were Factors h1, h2, and h3 respectively, each relating back to and explaining a portion of the larger Factor , H.

The remaining factors, B, and C, were small and of minor importance in terms of relating to the major hypotheses of the study.

The factor analysis essentially confirmed the interrelationship among the perceptual, attitudinal and performance variables. This was depicted in the higher order factor, H, and refined further in the smaller factors; h1, h2, and h3.

The next section describes multiple regression analyses which were conducted for the purpose of predicting certain criteria of interest.

Multiple Regression Analyses

In the first set of analyses, the 14 following variables were designated as possible predictors: pay level; locus of control; locus of control x pay; age; sex; college year; grade-point average; task interest item I; performance-reward contingency item I; satisfaction
with performance; perception of successful performance; performance-reward contingency item II; internal attributions; and stable attributions. Separate regression equations were generated to predict each of the following criteria: (1) perceived effort expended; (2) intrinsic motivation; (3) task satisfaction; (4) behavioroid task interest; and (5) task performance.  

Practice performance was omitted as a possible predictor in all the analyses as stated in Study I.

Tables 29, 30, 31, 32, and 33 present those variables (and the order of selection, from top to bottom) which were selected into the prediction battery for each of the five previously mentioned criteria. Each table contains the same information reported in the multiple regression analyses section for Study I.

**Prediction of Self-Rated Effort**

The following variables were selected into the regression equation to predict effort: the perception of having performed the task successfully; performance-reward contingency item I; age, internal attributions, and stable attributions. The Multiple R for the regression equation was .380.

All variables received positive weights except for the stable attribution measure. This construct seemed to act as a suppressor variable to the internal attribution measure, and thus received a

---

7Mulreg (Multiple Regression Routines, Wherry, 1975) was used to generate all regression equations using the Wherry Test Selection Technique.
### TABLE 29

Stepwise Multiple Regression Analysis Utilizing Variables 1 Through 14 as Predictors of Self-Rated Effort Expended on Embedded Word Task for Study II Sample (N=114)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee Wt.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>Perf. Perceived Succ.</td>
<td>.173</td>
<td>.119</td>
<td>1.862</td>
</tr>
<tr>
<td>9.</td>
<td>Perf-Rew Cont. Item I</td>
<td>.166</td>
<td>.103</td>
<td>1.842</td>
</tr>
<tr>
<td>4.</td>
<td>Age</td>
<td>.169</td>
<td>.085</td>
<td>1.880</td>
</tr>
<tr>
<td>13.</td>
<td>Internal Attributions</td>
<td>.257</td>
<td>.176</td>
<td>1.996</td>
</tr>
<tr>
<td>14.</td>
<td>Stable Attributions</td>
<td>-.149</td>
<td>-.105</td>
<td>-1.191</td>
</tr>
</tbody>
</table>

F for Increase = 1.418, DF = 5, 108

A Weight = 1.973, Mult. R = .380, Shrunken R = (.323, .234)
### TABLE 30

**Stepwise Multiple Regression Analysis Utilizing Variables 1 Through 14 as Predictors of Intrinsic Motivation for Study II Sample (N=114)**

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee Wt.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Internal Attributions</td>
<td>0.447</td>
<td>3.497</td>
<td>4.174</td>
</tr>
<tr>
<td>8</td>
<td>Task Interest Item I</td>
<td>0.239</td>
<td>1.858</td>
<td>2.865</td>
</tr>
<tr>
<td>11</td>
<td>Perf. Perceived Succ.</td>
<td>0.238</td>
<td>1.878</td>
<td>2.807</td>
</tr>
<tr>
<td>12</td>
<td>Perf-Rew Cont Item II</td>
<td>0.155</td>
<td>1.116</td>
<td>1.975</td>
</tr>
<tr>
<td>14</td>
<td>Stable Attributions</td>
<td>-0.154</td>
<td>-1.241</td>
<td>-1.465</td>
</tr>
<tr>
<td>7</td>
<td>Grade-Point Average</td>
<td>-0.087</td>
<td>-2.228</td>
<td>-1.555</td>
</tr>
</tbody>
</table>

F for Increase = 1.335, DF = 6, 107

A Weight = -1.066, Mult. R = .640, Shrunken R = (.614, .580)
### TABLE 31
Stepwise Multiple Regression Analysis Utilizing Variables 1 Through 14 as Predictors of Task Satisfaction for Study II Sample (N=114)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee Wt.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Task Interest Item I</td>
<td>.413</td>
<td>1.323</td>
<td>4.992</td>
</tr>
<tr>
<td>13</td>
<td>Internal Attributions</td>
<td>.381</td>
<td>1.233</td>
<td>3.505</td>
</tr>
<tr>
<td>11</td>
<td>Perf. Perceived Succ.</td>
<td>.286</td>
<td>.933</td>
<td>2.812</td>
</tr>
<tr>
<td>14</td>
<td>Stable Attributions</td>
<td>-.200</td>
<td>-.668</td>
<td>-1.871</td>
</tr>
<tr>
<td>10</td>
<td>Sat. with Performance</td>
<td>-.121</td>
<td>-.348</td>
<td>-1.182</td>
</tr>
<tr>
<td>4</td>
<td>Age</td>
<td>-.114</td>
<td>-.273</td>
<td>-1.408</td>
</tr>
<tr>
<td>6</td>
<td>College Year</td>
<td>.092</td>
<td>1.139</td>
<td>1.115</td>
</tr>
</tbody>
</table>

F for Increase = 1.243, DF = 7, 106

A Weight = 2.881, Mult. R = .633, Shrunken R = (.601, .559)
TABLE 32

Stepwise Multiple Regression Analysis Utilizing Variables 1 Through 14 as Predictors of Behavioroid Task Interest for Study II Sample (N=114)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee Wt.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Task Interest Item I</td>
<td>.259</td>
<td>.138</td>
<td>2.679</td>
</tr>
<tr>
<td>2</td>
<td>External Loc. Control</td>
<td>-.247</td>
<td>-.056</td>
<td>-2.759</td>
</tr>
<tr>
<td>5</td>
<td>Sex</td>
<td>.136</td>
<td>.306</td>
<td>1.525</td>
</tr>
<tr>
<td>10</td>
<td>Sat. with Performance</td>
<td>-.149</td>
<td>-.071</td>
<td>-1.568</td>
</tr>
<tr>
<td>13</td>
<td>Internal Attributions</td>
<td>.202</td>
<td>.112</td>
<td>1.687</td>
</tr>
<tr>
<td>14</td>
<td>Stable Attributions</td>
<td>-.138</td>
<td>-.076</td>
<td>-1.130</td>
</tr>
<tr>
<td>12</td>
<td>Perf-Rew Cont Item II</td>
<td>.094</td>
<td>.046</td>
<td>1.019</td>
</tr>
</tbody>
</table>

F for Increase = 1.038, DF = 7, 106
A Weight = .374, Mult. R = .462, Shrunken R = (.402, .313)
TABLE 33

Stepwise Multiple Regression Analysis Utilizing Variables 1 Through 14 as Predictors of Task Performance for Study II Sample (N=114)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee Wt.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>Grade-Point Average</td>
<td>.163</td>
<td>1.881</td>
<td>2.177</td>
</tr>
<tr>
<td>8.</td>
<td>Task Interest Item I</td>
<td>.130</td>
<td>.452</td>
<td>1.560</td>
</tr>
<tr>
<td>12.</td>
<td>Perf-Rew Cont Item II</td>
<td>.114</td>
<td>.368</td>
<td>1.457</td>
</tr>
<tr>
<td>10.</td>
<td>Sat. with Performance</td>
<td>.139</td>
<td>.434</td>
<td>1.429</td>
</tr>
</tbody>
</table>

F for Increase = 2.041, DF = 5, 108

A Weight = 3.032, Mult. R = .636, Shrunken R = (.614, .585)
negative weight. This conclusion is based on the finding that the stable attribution measure was selected directly after the internal attribution variable and that the latter had some validity with the criterion ($r = .19, p < .05$) while the former did not ($r = .04, \text{n.s.}$). The two attribution measures were, in turn, highly interrelated ($r = .70, p < .01$).

The rather low Multiple R of .380 for the regression equation may be explained by the fact that the highest single correlation among all the predictors with effort was only .23.

The following equation, derived through regression analysis, can be used to predict an individual's effort score:

$$0.119 \text{ (performance perceived as successful score)} + 0.03 \text{ (performance-reward contingency item I score)} + 0.085 \text{ (subject's age)} + 0.176 \text{ (internal attribution score)} - 0.105 \text{ (stable attribution score)} + 1.973.$$  

**Prediction of Intrinsic Motivation**

The 6 following variables were selected into the regression equation to predict intrinsic motivation: internal attributions; task interest item I; the perception of having performed the task successfully; performance-reward contingency item II; stable attributions, and grade-point average. Four of these variables were also predictive of intrinsic motivation in Study I. The Multiple R for the regression equation was .640.

It is important to note that pay was not selected as a predictor of intrinsic motivation. This can be explained by the nonsignificant correlation between pay and intrinsic motivation ($r = .08, \text{n.s.}$).
Also of importance is the finding that locus of control orientation did not moderate the effect of pay on intrinsic motivation since pay \times\text{ locus of control} did not enter the regression equation as a predictor. Thus, neither pay nor the interaction of pay with locus of control were predictive of an individual's intrinsic motivation.

Task specific causal attributions were, however, predictive of intrinsic motivation. As was the case in Study I, internal attributions was the best single predictor of intrinsic motivation.

In order to predict an individual's intrinsic motivation level, the following equation can be used:

\[
3.497 \text{ (internal attribution score) + 1.858 (task interest item I score) + 1.878 (performance perceived as successful score) + 1.116 (performance-reward contingency item II score) - 1.241 (stable attribution score) - 2.228 (subject's grade-point average) - 1.066.}
\]

Prediction of Task Satisfaction

The 7 following variables were selected as the best predictor combination of task satisfaction: task interest item I; internal attributions; perception of performance being successful; stable attributions; satisfaction with performance; age, and college year. Five of these variables were the same as those selected in Study I to predict this construct. The Multiple R for the regression equation was .633.

The following equation, derived through regression analysis, can be used to predict an individual's task satisfaction score:

\[
1.323 \text{ (task interest item I score) + 1.233 (internal attribution score) + .933 (performance perceived as successful score) - .668 (stable attribution score) }
\]
- .348 (satisfaction with performance score) - .273 (subject's age) + 1.139 (college year; 1 = Fr; 2 = So; 3 = Jr; 4 = Sr) + 2.881.

**Prediction of Behavioroid Task Interest**

Seven variables were selected into the regression equation to predict behavioroid task interest: task interest item I; external locus of control; sex; satisfaction with performance; internal attributions; stable attributions, and performance-reward contingency item II. The Multiple R for the regression equation was .462.

Task interest item I was the best single predictor of behavioroid task interest. An interesting finding was the negative weight on locus of control, suggesting that externally controlled individuals would be less likely to: recommend the task to somebody to try; return and perform the task for no credit or pay; and desire to receive a copy of the task than internally controlled subjects.

Sex (females receiving a higher predicted criterion score), internal attributions and performance-reward contingency item II also contributed toward the prediction of the criterion and received positive regression weights.

Stable attributions and satisfaction with performance received negative weights but nevertheless contributed toward the prediction of the criterion. Their negativity cannot be attributed to their negative validity with the criterion (both were unrelated to the criterion in the original correlation matrix) but to the effect of having partialled out the influence of the other variables prior to their selection into the regression equation. This partialling
technique is a result of the mathematics involved in computing regression analyses.

In order to predict an individual's behavioral task interest score, the following equation can be used:

\[
.138 \text{(task interest item I score)} - .056 \text{(external locus of control score)} + .306 \text{(sex; } 1 = \text{male; } 2 = \text{female)}
- .071 \text{(satisfaction with performance score)} + .112 \text{(internal attribution score)} - .076 \text{(stable attribution score)} + .046 \text{(performance-reward contingency item II score)} + .374.
\]

**Prediction of Task Performance**

Five variables were selected into the regression equation to predict task performance: perception of successful task performance; grade-point average; task interest item I; performance-reward contingency item II, and an individual's satisfaction with his performance. The Multiple R was .636 for the regression equation.

All variables selected into the regression equation received positive weights. Similar to the results of Study I, an individual's perception concerning the adequacy of his past performance was the best single predictor of his actual task performance, supporting the contention that perceptions can often be realistic estimates of actual events.

Grade-point average was positively related \( r = .24, p < .01 \) to task performance and thus received a positive regression weight. Task interest item I, performance-reward contingency item II, and satisfaction with performance were all positively correlated with task performance, thus explaining their receiving positive weights.
Those variables which best predicted performance ranged from the perceptual (variables 11 and 12) to the attitudinal (variables 8 and 10) and motivational-ability (variable 7).

The following equation, derived through regression analysis, can be used to predict an individual's task performance score:

\[ 1.401 \text{ (performance perceived as successful score)} + 1.881 \text{ (grade-point average)} + .452 \text{ (task interest item I score)} + .368 \text{ (performance-reward contingency item II)} + .434 \text{ (satisfaction with performance score)} + 3.032. \]

Finally, viewing task performance as the outcome variable, all variables in Study II (except for practice performance) were entered into stepwise multiple regression analysis as possible predictors of the criterion of task performance.

Table 34 presents those variables which were selected into the regression equation, the Multiple R obtained, the two Shrunken R's, the F for increase, Beta and Bee Weights, T for the Weights, and the A Weight.

Of the 19 possible predictors, 8 were selected into the final regression equation to predict task performance: the perception of having performed the task successfully; intrinsic motivation; grade-point average; task interest item II; satisfaction with performance; perceived effort expended; stable attributions, and internal attributions.

The Multiple R increased slightly from .636 to .688 when all variables (except for practice performance) were entered as possible predictors.
TABLE 34
Stepwise Multiple Regression Analysis Utilizing Variables 1 Through 19 as Predictors of Task Performance for Study II Sample (N=114)

<table>
<thead>
<tr>
<th>Variable Number</th>
<th>Variable Name</th>
<th>Beta Wt.</th>
<th>Bee St.</th>
<th>T for Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.</td>
<td>Intrinsic Motivation</td>
<td>.183</td>
<td>.082</td>
<td>1.732</td>
</tr>
<tr>
<td>7.</td>
<td>Grade-Point Average</td>
<td>.206</td>
<td>2.376</td>
<td>2.848</td>
</tr>
<tr>
<td>16.</td>
<td>Task Interest Item II</td>
<td>.221</td>
<td>.843</td>
<td>2.174</td>
</tr>
<tr>
<td>10.</td>
<td>Sat. with Performance</td>
<td>.158</td>
<td>.494</td>
<td>1.676</td>
</tr>
<tr>
<td>15.</td>
<td>Effort Expended</td>
<td>-.140</td>
<td>-.721</td>
<td>-1.750</td>
</tr>
<tr>
<td>14.</td>
<td>Stable Attributions</td>
<td>-.187</td>
<td>-.678</td>
<td>-1.854</td>
</tr>
<tr>
<td>13.</td>
<td>Internal Attributions</td>
<td>.139</td>
<td>.486</td>
<td>1.251</td>
</tr>
</tbody>
</table>

F for Increase = 1.564, DF = 8, 105

A Weight = 5.011, Mult. R = .688, Shrunken R = (.658, .620)
Again, an individual's perception of how well he performed on the task was most predictive of his actual performance. An individual's intrinsic motivation was the next best predictor in combination with the first, supporting the contention that this construct was important in terms of its ability to predict and explain behavior.

In order to predict an individual's task performance score, the following equation derived through regression analysis can be used:

\[
1.025 \text{ (performance perceived as successful score)} + 0.082 \text{ (intrinsic motivation score)} + 2.376 \text{ (grade-point average)} + 0.843 \text{ (task interest item II score)} + 0.494 \text{ (satisfaction with performance score)} - 0.721 \text{ (effort score)} - 0.678 \text{ (stable attribution score)} + 0.486 \text{ (internal attribution score)} + 5.011.
\]

**Evidence Relation to Proposed Motivation Model**

Figure 3 presents the correlations obtained among the variables in Study II which pertain to the proposed motivation model outlined in Chapter III.

As pointed out in Study I, it is not possible to test for causality among the variables based on these static correlation coefficients. The purpose, therefore, is to make a preliminary exploration of the interrelationships among the variables.

Specific task related causal attributions were related to intrinsic motivation, but not as strongly as in Study I.

Intrinsic motivation was in turn significantly related to performance (\(r = .47, p < .01\)) and task satisfaction (\(r = .69, p < .01\)).

The linkage between causal attributions and effort was generally not supported as evidenced by r's of .19 and .04 between internal and
Stable Causal Attributions

Internal Locus of Control Orientation*  

Internal Causal Attributions

Effort  

Performance

Satisfaction

Intrinsic Motivation

*p's inverted for locus of control measure so as to indicate internal control.  
p<.05 when r≥.19  
p<.01 when r≥.24

Figure 3.—Correlations among Proposed Variables in Motivation Model for Study II Sample (N=114).
stable attributions with effort, respectively. Effort, in turn, was not related to performance ($r = .14$, n.s.). However, the performance-task satisfaction link ($r = .41$, $p < .01$) occurred again. This finding, as pointed out in Study I, may be explained by the fact that, for the majority of the sample, rewards were directly contingent on task performance (Porter and Lawler, 1968).

As was the case in Study I, performance on the task was not strongly related to causal attributions made concerning past performance as evidenced by the correlations of .25 and .07 in the feedback loop between performance and internal and stable attributions, respectively.

Internal locus of control orientation was somewhat related to causal attributions concerning previous task performance as evidenced by an $r = .19$ ($p < .05$) and an $r = .22$ ($p < .05$) between this construct and stable and internal attributions, respectively. Although these correlations were significant at the .05 level, their magnitude is such that they explain little variance.

In summary, the correlation and factor analysis along with the multiple regression analysis for Study I and Study II appears to support the causal attribution $\rightarrow$ intrinsic motivation $\rightarrow$ performance $\rightarrow$ satisfaction linkage posited by the model.

Neither money or general locus of control orientation had a significant influence on these variables, as was originally postulated.

The results of Study I and Study II supported the importance of the construct of intrinsic motivation in terms of its empirical
relation with performance and task satisfaction. In both studies, pay did not have the adverse effect on intrinsic motivation as predicted by cognitive evaluation and self-perception theorists (Bem, 1967; Deci, 1971).

Task specific causal attribution measures had more utility in terms of predicting and explaining behavior than did a generalized theory of causal attributions (Rotter, 1966). Although a generalized locus of control orientation did not moderate the effects pay had on intrinsic motivation, it is possible that the interaction of pay with task specific causal attributions may produce different results.

Future research might examine if task specific causal attributions moderate the effect pay has on intrinsic motivation, performance, and satisfaction in longitudinal experiments conducted in both laboratory and field settings.

Implications of Findings for Theory and Practice

The results of Study I and Study II did not support a cognitive evaluation or self-perception theory framework in terms of the predicted adverse effect of monetary rewards on intrinsic motivation. This finding would seem to support the expectancy theory proposition that intrinsic and extrinsic motivation are additive rather than interactive. However, the interaction hypothesis might be more appropriately assessed by varying both intrinsic and extrinsic motivation and testing for the interaction as per Calder and Staw's (1974b) recent study.
The results of this investigation indicated that monetary rewards can be made contingent on performance without having an adverse effect on intrinsic motivation. Further, when money is applied in this fashion, performance and satisfaction tended to be significantly interrelated, a finding supportive of expectancy theory (Porter and Lawler, 1968).

The finding that pay level was unrelated to an individual's estimation of the causal influence pay had on his past performance might explain why monetary rewards had little effect on the dependent variables. That is, it is likely that the varying pay levels did not effect an individual's self- attributions. If this were true, then individual's did not experience a shift in perceived locus of causality (Heider, 1958) and hence no change in the self-perception of intrinsic motivation. Future research might examine what kinds of variables (and at what amounts) are responsible for shifts in the self- attribution process, and determine the linkage between these shifts with overt changes in behavior.

In terms of possible implications for behavior in organizational settings, these findings seem to support the notion that when reward contingencies are clear and feedback on performance occurs on a regular basis, then individuals tend to be realistic in their assessment of their capabilities and in evaluating their previous level of performance. Although it is with extreme caution that one attempts to generalize from the laboratory to the field setting, these findings might indicate that under these circumstances, individuals might be
able to give effective self-appraisals of their past performance in a performance appraisal context. In terms of a goal-setting program, the inputs of the employee might represent a valuable addition to those goals set by the supervisor or manager— an aid in the development or enhancement of an MBO program. The findings would seem to be best explained by expectancy theory. Under the kinds of climate contingencies previously described, individual's would be able to build up realistic expectancies concerning the probability that effort on their part would result in successful performance as well as the expectancy that performance would lead to various outcomes on the job. The kinds of benefits that might be accrued to both the organization and the individual would seem to warrant an empirical field investigation within each organizational setting in order to assess what change, if any, in organization design might best achieve these desired outcomes.

With regard to the present research, the unique contributions appear to have been in the use of varying and wide ranges of pay, previously not used to test cognitive evaluation theory; the use of a personality construct (Rotter, 1966) as a possible moderator of the effects of pay on intrinsic motivation; and the use of causal attribution measures as induction checks and as predictors of behavior.

The varying pay levels and the use of Rotter's (1966) locus of control construct were designed to provide a stronger test of the theory. As such, the results indicated that with the stronger test, support was not found for the theory. Surprisingly, the varying pay
levels used did not result in an accompanying shift in monetary causal attributions, thus indicating that the self-perception assumption that contingent extrinsic rewards affect an individual's perceived locus of causality is not always true. This latter finding may indicate that only extremely high levels of reward will result in a shift in the perceived locus of causality when college students work on an interesting laboratory task. The more central question, however, appears to be in the linkage between an individual's perceived locus of causality with his overt behavior. The present findings do not answer this or the previous shift assumption, but as a result of this research, it appears that these should be areas of concern for any future research on cognitive evaluation theory.

Abstract Style Summary of Study I and Study II

This dissertation was directed toward testing an attributional model of motivation incorporating the variables of locus of control, monetary rewards, causal attributions for performance, intrinsic motivation, perceived effort, performance and satisfaction. The outline of such a model was developed largely from the works of Weiner (1972) on attribution and achievement theory and Porter and Lawler's (1968) expectancy model of motivation. Utilizing this theoretical framework, two studies were conducted to: (1) test cognitive evaluation theory predictions that pay will adversely affect an individual's intrinsic motivation on an interesting task; (2) determine whether locus of control orientation may moderate the effect pay has on intrinsic motivation and other criteria of interest; (3)
examine the empirical relationships among the proposed variables in the motivation model; and (4) determine the utility of specified variables in terms of their ability to predict certain criteria of interest.

Subjects for Study I were 55 introductory psychology students where Study II engaged 114 Ss. In both studies, subjects worked on embedded word problems under no reward and varying pay level conditions. After completion of task performance, subjects filled out post experimental questionnaires containing variables relevant to testing the proposed motivation model.

Results for both studies were analyzed by correlational and factor analysis, along with multiple regression analysis whereby a specified set of variables were designated as predictors and another set as criteria.

The findings were strikingly similar for both studies. Contrary to cognitive evaluation theory predictions (Deci, 1971), pay had little influence on any of the variables in the motivation model. Generally, the perceptual, attitudinal and performance variables were strongly interrelated. Thus, support was found for the causal attribution + intrinsic motivation + performance + satisfaction linkage posited by the model.

Money and/or locus of control orientation did not have a significant influence on these variables, nor did locus of control moderate the effects pay had on intrinsic motivation.

The results of both studies supported the importance of the construct of intrinsic motivation in terms of its empirical relationship with task performance and satisfaction.
Of additional interest, task specific causal attributions had more utility in terms of explaining and predicting behavior than did a generalized theory of causal attributions (Rotter, 1966).

It was concluded that future research might examine if task specific causal attributions moderate the effect pay has on intrinsic motivation, performance, and satisfaction in longitudinal experiments conducted in both laboratory and field settings.

The implications of the findings were discussed in relation to several theoretical frameworks and in terms of behavior in organizational settings.
APPENDIX A

Experimental Instructions,
Tasks and Questionnaires
Experimental Instructions
Experimental Procedures

Control Groups

1. After all subjects entered the experimental room, E signed their experimental cards and said:

Full experimental credit is being given to all subjects for coming to this experiment and this credit is not, in any way, related to your performance during the actual experiment.

O.K. Let's begin. This week I am collecting data on a new measure of problem solving. The name of this measure is the Quick Identification Scale. I am currently in the process of collecting data on the task in front of you; the Embedded Word Problem. There are 6 problems in the folder and you will be asked to work on them. One of these is a sample problem. Please open the folder and look at the SAMPLE COPY of the task, read the instructions and look up when you are ready.

2. When Ss looked up, E said:

Now the sample embedded word problem as well as the two embedded word problems which follow the sample are practice problems. That is, the first three problems in your folder, including the sample, are practice problems. Practice on the first three problems should help you when you work on the last three problems. In order to assist you in keeping a record of how many words you have located for each problem, please use the PROGRESS REPORT FORM which is located behind the SAMPLE PROBLEM. You will have two minutes to work on the SAMPLE PROBLEM and eight minutes to work on each of the other five problems in the set. If you should finish a problem before time is up, close your folder and wait for further instructions. Do not start work on the next problem nor are you to go back to an earlier problem.

For practice, I would like you to work on the sample problem as well as the two problems which directly follow the sample. Try to do your best on these three problems so that you will be able to do the final three problems. Are there any questions at this time? (questions were answered by re-reading the relevant sections of the instructions). O.K. Look only for the words at the bottom of the page; all of them can be found. O.K. Go. (E stopped Ss after two minutes).
Stop. Please record the number of words you found on the PROGRESS REPORT FORM. In order to assist you in locating the words you might first want to scan the list and then systematically go up and down each column in search of the first letter of each word. When you find a letter which is the first letter of a word you are looking for, check all directions for the second letter. If you find the second letter then see if the next letter in the direction in which you found the second letter is the third letter. Keep going until you have found that word. AGAIN THIS IS JUST A SUGGESTION AND YOU NEED NOT FOLLOW IT IF YOU WISH TO USE ANOTHER APPROACH. I am now going to give you a copy of the problem you just worked on which will show you where all the embedded words were. Although each problem in the set is slightly different, this will help you understand how to work these problems. Let's take about three minutes to look over the answers (E handed out the answers to all Ss and collected them after three minutes).

O.K. that should give you a better feel for it. When I say go, please start work on the next problem in your folder. REMEMBER, you get a word correct only if it appears on the list located UNDER THE PROBLEM. That is, only look for the 12 words on the list. In addition, remember to record your performance on the PROGRESS REPORT FORM when you are finished working on each problem.

O.K. You will have eight minutes to work on the next practice problem. O.K. Go. (E stopped Ss after eight minutes).

Stop. Please record your performance on the PROGRESS REPORT FORM. Once again, I am going to give you a copy of the problem you just worked on which will show you where the embedded words were. Let's take about three minutes to look over the answers (E handed out the answers to all Ss and collected them after three minutes). O.K. When I say go, begin working on the final practice problem. O.K. Go. (E stopped Ss after eight minutes).

Stop. Please record your performance on the PROGRESS REPORT FORM. Here is a copy of the problem you just worked on which will show you where the embedded words were. Let's take about three minutes to look over the answers (E handed out the answers to all Ss and collected them after three minutes).

In order to assist you in keeping a record of how many words you have located for the next three problems, use the PROGRESS REPORT FORM. In addition, so that you know how many words you have found, I am going to distribute a cup containing chips to each of you (E removed the cups from his briefcase and distributed them to each subject. Each cup contained 36 chips). Place the
cup next to you on your desk within easy reach. Please remove a chip from the cup next to you, each time you locate a word when you begin working on the next three problems. You will have eight minutes to work on each problem. O.K. When I say go, begin working on the next problem. O.K. Go. (E stopped Ss after eight minutes).

Stop. Please record the number of words you located on the PROGRESS REPORT FORM. In addition, remember to remove a chip from the cup next to you each time you locate a word. When I say go, begin working on the next problem. O.K. Go. (E stopped Ss after eight minutes).

Stop. Please record the number of words you located on the PROGRESS REPORT FORM. In addition, remember to remove a chip from the cup each time you locate a word. When I say go, begin working on the next problem. O.K. Go. (E stopped Ss after eight minutes).

O.K. Stop. Please record the number of words you located on the PROGRESS REPORT FORM (When Ss completed filling out their forms, E said):

Now I would like to go around and check with each of you individually by going through each of the three problems with you (E went around to each subject individually, showed him/her where the embedded words were, and collected the cups and poker chips).

3. When this procedure was finished, E said:

Now that we have finished working on the embedded word problem task, please fill out the questionnaires that follow immediately after the last embedded word problem. When you are finished filling out your questionnaire, please wait at your seat until you receive further instructions.

4. When all subjects completed filling out the questionnaires, E said:

O.K. Please hand in your folders and then return to your seats.

5. When all subjects returned to their seats after handing in their folders, they were debriefed. They were informed of the purpose of the research, the condition in which they participated as well as why they were asked to complete the questionnaires. In addition, Ss were asked not to speak to anyone about the nature of the experiment. Subjects were then given the opportunity to ask any questions pertaining to the research.
Experimental Procedures

Experimental Groups

1. After all subjects entered the experimental room, E signed their experimental cards and said:

   Full experimental credit is being given to all subjects for coming to this experiment and this credit is not, in any way, related to your performance during the actual experiment.

   O.K. Let's begin. This week I am collecting data on a new measure of problem solving. The name of this measure is the Quick Identification Scale. I am currently in the process of collecting data on the task in front of you; the Embedded Word Problem. There are six problems in the folder and you will be asked to work on them. One of these is a sample problem. Please open the folder and look at the SAMPLE COPY of the task, read the instructions and look up when you are ready.

2. When S looked up, E said:

   Now the sample embedded word problem as well as the two embedded word problems which follow the sample are practice problems. That is, the first three problems in your folder, including the sample, are practice problems. Practice on the first three problems should help you when you work on the last three problems. In order to assist you in keeping a record of how many words you have located for each problem, please use the PROGRESS REPORT FORM which is located behind the SAMPLE PROBLEM. You will have two minutes to work on the SAMPLE PROBLEM and eight minutes to work on each of the other five problems in the set. If you should finish a problem before time is up, close your folder and wait for further instructions. Do not start work on the next problem nor are you to go back to an earlier problem.

   For practice, I would like you to work on the sample problem as well as the two problems which directly follow the sample. Try to do your best on these three problems so that you will be able to do the final three problems. Are there any questions at this time? (questions were answered by re-reading the relevant section(s) of the instructions). O.K. Look only for the words at the bottom of the page; all of them can be found. O.K. Go. (E stopped S after two minutes).

   Stop. Please record the number of words you found on the PROGRESS REPORT FORM. In order to assist you in locating the words you might first want to scan the list and then systematically go up and down each column in search of the first letter of each word. When you find a letter which is the first letter
of a word you are looking for, check all directions for the second letter. If you find the second letter then see if the next letter in the direction in which you found the second letter is the third letter. Keep going until you have found that word. AGAIN THIS IS JUST A SUGGESTION AND YOU NEED NOT FOLLOW IT IF YOU WISH TO USE ANOTHER APPROACH. I am now going to give you a copy of the problem you just worked on which will show you where all the embedded words were. Although each problem is slightly different, this will help you understand how to work these problems. Let's take about three minutes to look over the answers (E handed out the answers to all Ss and collected them after three minutes).

O.K. that should give you a better feel for it. When I say go, please start work on the next problem in your folder. REMEMBER, you get a word correct only if it appears on the list located UNDER THE PROBLEM. That is, only look for the 12 words on the list. In addition, remember to record your performance on the PROGRESS REPORT FORM when you are finished working on each problem.

O.K. You will have eight minutes to work on the next practice problem. O.K. Go. (E stopped Ss after eight minutes).

Stop. Please record your performance on the PROGRESS REPORT FORM. Once again, I am going to give you a copy of the problem you just worked on which will show you where the embedded words were. Let's take about three minutes to look over the answers (E handed out the answers to all Ss and collected them after three minutes). O.K. When I say go, begin working on the final practice problem. O.K. Go. (E stopped Ss after eight minutes).

Stop. Please record your performance on the PROGRESS REPORT FORM. Here is a copy of the problem you just worked on which will show you where the embedded words were. Let's take about three minutes to look over the answers (E handed out the answers and collected them after three minutes).

Since this research is supported by a Departmental Research Grant, as an INCENTIVE, to encourage good performance, I am paying ALL PARTICIPANTS in this study _____ cents for every word they find. This means, as with all other people like yourself, I am giving _____ cents for every word found by ALL people who participate in this study. That is, each word is worth _____ cents to you and if you find all the words in the three problems on which you will work, you will earn ____ (total amount). A number of people who have already participated in this experiment have found all the words in the three problems and have therefore earned ____ (total). The incentive rate has been set at ____ cents
a word as a result of extensive discussions with other Introductory Psychology students, like yourself, who have participated in this experiment. Their feeling is that the ____-cent rate is just the right amount. That is, they stated that ____ cents a word was NOT too high nor too low a rate to pay other Introductory Psychology students, like yourself, for working on the Embedded Word Problem Task. In order to assist you in keeping a record of how many words you have located, please use the PROGRESS REPORT FORM. In addition, so that you know how much money you have earned, I am now going to distribute a cup containing ____ (total amount possible) to each of you (E removed the cups from his briefcase and distributed them to each subject. Each was properly filled with the right amount of money prior to distribution). Place the cup next to you on your desk within easy reach. Please remove ____ cents from the cup next to you, each time you locate a word when you begin working on the next three problems. There is ____ (amount of money in cup) in the cup and if you find all the words in the three problems, during the 24 minutes on which you will be working on them, as I told you before, you will earn it. Also, on the PROGRESS REPORT FORM, please add a column next to each problem indicating the amount of money you earned for that problem. You will have eight minutes to work on each of the next three problems. O.K. When I say go, begin working on the next problem. O.K. Go. (E stopped S after eight minutes).

Stop. Please record the number of words you located as well as the amount of money you earned on the PROGRESS REPORT FORM. In addition, remember to remove ____ cents from the cup next to you each time you locate a word. When I say go, begin working on the next problem. O.K. Go. (E stopped S after eight minutes).

Stop. Please record the number of words you located as well as the amount of money you earned on the PROGRESS REPORT FORM. In addition, remember to remove ____ cents from the cup each time you locate a word. When I say go, begin working on the next problem. O.K. Go. (E stopped S after eight minutes).

O.K. Stop. Please record the number of words you located as well as the amount of money you earned for this problem, and the total amount of money you earned by adding another column on the PROGRESS REPORT FORM (E demonstrated that S should do).

Now I would like to go around and check with each of you individually by going through each of the three problems with you (E went around to each subject individually, showed him/her where the embedded words were, and collected the cups and excess change from each subject).
3. When this procedure was finished, E said:

Now that we have finished working on the embedded word problem task, please fill out the questionnaires that follow immediately after the last embedded word problem. When you are finished filling out your questionnaire, please wait at your seat until you receive further instructions.

4. When all subjects completed filling out the questionnaires, E said:

O.K. Please hand in your folders and then return to your seats.

5. When all subjects returned to their seats after handing in their folders, they were debriefed. They were informed of the purpose of the research, the condition in which they participated as well as why they were asked to complete the questionnaires. In addition, Ss were asked not to speak to anyone about the nature of the experiment. Subjects were then given the opportunity to ask any questions pertaining to the research.
EXPERIMENTAL TASKS
Sample Embedded Word Problem

INSTRUCTIONS: The embedded words listed below appear forward, backward, up, down or diagonally in the letter matrix. Your task is to find each of the embedded words and box it in, as shown in the sample, with your pencil. In order to assist you, keep a record of how many words you have located by using the Progress Report Form for each problem, including the sample, that you work on. The Progress Report Form is located behind the Sample Problem.

As you can see, the word DEFENSE has been boxed in. Now you try to find the following words:

ALLEGED Educational Pertinent
CIRCUMSTANTIAL HEARSAY NEGATE
CITATION LETTER STRICT
DOCUMENT MANIFEST VINDICATE
Progress Report Form

Please indicate the number of words you have located for each problem.

Sample Problem  
First Problem  
Second Problem  
Third Problem  
Fourth Problem  
Fifth Problem  
Sixth Problem  
Seventh Problem  
Eighth Problem
Embedded Word Problem

LOT SOF LUCK ZIVNILVMUJXL
D TREFSUVUIARITUXEDOING
SISTERINTAERITILSLXUMN
DADDYNIGHTCLMUVYDIDE
CBNBQKYAOMEAREKNUBCAG
RPAAUEKRMUROAEPORTUXCC
VSDAEREIPEWNTABLELBD
BARYEADNUONPARAERCVFS
WTTICANNONOEOSEARMRHT
XRTITLIAUNASHOTDAUDCM
YFFSNIBACOTTTNNEEEELF
MSSROTAIDARETARCRCTMN
AUEMUESUMNOGGAWOYULV
MNBEWNRPOOLGEBLCLMIU
THEIRAILTOLOMYIPESTMCC
DYNONEHEHTRAPRSRARNTDX
ILIUTECOURSEENTRYEUCY
EATASROLRAPUMARKETBXZ
DIERKYSABMBOTOMBVA
YESCOTTCARCECDTTLCYN
MOMMYSEXYOUVLMLIFRIDISO

The embedded words are:

BAR ROOM  GARRET  MUSEUM
BUS        LYCEUM  THEATRE
CLUB       MERRY GO ROUND  UNIVERSITY
EMBASSY    MONASTERY  WAGON
Embedded Word Problem

K O S E S U B P R T S M R A L A E R I F M
Q S J K U P O H S E O H S A I D C S L E A
L T C F P G M H V A C E U S B Z I K X N I
N O I U E L N S A P U N E F T G F L O C L
R P E G R A E Z B A D E O G A E F A B E T
E L E A M B C T W R R H X N R Y O W L S R
T I S R A B S R O T W O P T Y M Y M I B U
N G U A R D X M R M D M A X L K S D A S C
E H O G K Y A A S E U E V P H S O I M T K
C R H E E T I Q R N H S L A T I P S O H R
N S E S T N P S T T I A A S F F A P Y G T
O A R E S G F S H S Y K O A L D O D C I D
I D I F S H N S E Y L P C O J H R F S L N
T C F K C E R H A R P T R B S A G E H C A
A B C R D E L R N M O I R T N R S T A I T
E O U R W O D O A R S T E T O U E R W F S
R H A O O S R L Y T M P S T O D S V O F S
C G L H S T R E E T L I G H T S D P I A W
E F C S H B N O I T A T S E C I L O P R E
R S S T R E E T S I G N S B A C I X A T N
D L N P Z A R N M T V L R A G S I P O N D

The embedded words are:

CARS
CHURCHES
HYDRANTS
LAMP POSTS
LAUNDROMAT
MAILTRUCK
PLAY YARDS
POLICE STATION
RIVER
SCHOOL
STREET SIGNS
STORES
The embedded words are:

BLACKBERRY  FEATHER  MOON
CLAM  GRAIN OF POWDER  OAK
CROCUS  GRANITE RELIEF  WASP'S NEST
EYE OF PARTRIDGE  HONEYCOMB  WHEAT GERM
Embedded Word Problem

PHILANTHROPIC
DETICTIVE
SEXUAL
FANCY

The embedded words are:

PHILANTHROPIC
DETTECTIVE
SEXUAL
FANCY

PAPER
SARDONIC
JINGLE
FRAGILE

TUNA FISH
SUMPTUOUS
FRUIT FLY
PRINCE
Embedded Word Problem

The embedded words are:

DEMONSTRATIVE  FULL OF LIFE  PROTRUDING
EVASIVE  SUMPTUOUS  LACONIC
GOLF  AVID  MELODIous
TRANSPARENT  INVISIBLE  INTERESTING
Post Experimental Questionnaires
Background Data Form

Name ________________________________
Age ____________
Sex: Male ___ Female ___
Race: Black ___ White ___ Other (Specify) ______
College Year: Frosh ___ Soph ___ Junior ___ Senior ___
Grade-Point Average (Cumulative) ________
Questionnaire A

We would like to know how you reacted to the Embedded Word Task on which you worked during the experiment. Please respond to the following statements by placing an X on the line which best describes your feeling for each statement. Please read each item with great care and only place one X for each statement.

1. Cents a word is just the right amount of money to pay people who work on the Embedded Word Problem Task; that is, a word is not too much nor too little.1

   Strongly Disagree __ __ __ __ __ __ __ __ __ __ Strongly Agree

2. The Embedded Word Problems on which I worked were DULL.

   Strongly Disagree __ __ __ __ __ __ __ __ __ __ Strongly Agree

3. Aside from experimental credit, in order to receive a reward I had to perform the task.

   Strongly Disagree __ __ __ __ __ __ __ __ __ __ Strongly Agree

4. I was disappointed with my performance on the Embedded Word Problems.

   Strongly Disagree __ __ __ __ __ __ __ __ __ __ __ __ __ __ Strongly Agree

5. My performance on the task was successful.

   Strongly Disagree __ __ __ __ __ __ __ __ __ __ __ __ __ __ Strongly Agree

6. The amount of effort you put forth on the Embedded Word Task was:

   Very Little __ __ __ __ __ __ __ __ __ __ __ __ __ __ Very Much

7. How much did you like the task on which you worked?

   Very Little __ __ __ __ __ __ __ __ __ __ __ __ __ __ Very Much

---

1Question 1 was omitted for control subjects.
Questionnaire B

Intrinsic Motivation^2

Please circle the number on the scale that represents the way you feel about the characteristic being rated. Low numbers represent small amounts and high numbers represent large amounts. For each item only circle one number.

1. To what extent did you find the embedded word task as being important?
   Very Little  1  2  3  4  5  6  7  Very Much

2. To what extent did you find the embedded word task as being meaningful?
   Very Little  1  2  3  4  5  6  7  Very Much

3. To what extent did working on the embedded word task result in feelings of self-esteem for you?
   Very Little  1  2  3  4  5  6  7  Very Much

4. To what extent did working on the embedded word task result in feelings of accomplishment for you?
   Very Little  1  2  3  4  5  6  7  Very Much

5. To what extent did working on the embedded word task result in feelings of achievement for you?
   Very Little  1  2  3  4  5  6  7  Very Much

6. To what extent did you have to use your skill and ability in order to perform the embedded word task?
   Very Little  1  2  3  4  5  6  7  Very Much

^2The titles of the constructs being measured were not included in the actual questionnaires, but are included here to help the reader.
7. To what extent did working on the embedded word task result in feelings of self-fulfillment for you?

Very Little 1 2 3 4 5 6 7 Very Much

8. Your feeling of satisfaction resulting from working on the embedded word task.

Very Little 1 2 3 4 5 6 7 Very Much

9. Your feelings of success on the embedded word task.

Very Little 1 2 3 4 5 6 7 Very Much

10. The interest you felt from the embedded word task.

Very Little 1 2 3 4 5 6 7 Very Much
Questionnaire C

Task Satisfaction and Enjoyment

Please indicate your feelings about the task in relation to EACH of the words below. Place a Y beside the item if it describes your feelings toward the task. If the item does NOT describe your feelings toward the task, place an N beside the item. If you cannot decide whether the item does or does not describe your feelings toward the task, place a ? beside the item.

___ Fascinating  ___ Useful
___ Routine               ___ Tiresome
___ Satisfying            ___ Healthful
___ Boring                ___ Challenging
___ Good                  ___ On your feet
___ Creative              ___ Simple
___ Respected             ___ Endless
___ Hot                   ___ Frustrating
___ Pleasant             ___ Gives sense of accomplishment
Questionnaire D

Causal Attributions

We would like you to think back to your performance on the embedded word problems. To what extent, would you say, that your level of performance was a result of the following factors. Place the appropriate number in the space next to the factor.

5 = maximum contribution
4 = contributed very much
3 = made a good contribution
2 = contributed somewhat
1 = did not contribute

1. Luck _____
2. Your Ability _____
3. Level of Difficulty of the Task _____
4. Your Effort _____
5. The Money^ _____

^Item 5 was omitted for control subjects.
Questionnaire E

Please fill in the answers to the following questions.

1. Aside from experimental credit, did you feel that rewards were contingent on performance (that is, did you have to work on the task in order to receive a reward)?

   Not at All __ __ __ __ __ __ __ __ Completely

   Please explain your answer:

2. Would you recommend the embedded word task to somebody to try?

   No, I would not recommend it        Yes, I would recommend it

3. Would you be willing to return and perform the task over again so that reliability data on performance can be collected (we will not be able to give you experimental credit nor give you any type of reward)?

   Yes ____ No ____ Date and time you are available:

4. The amount of money you received for your performance on the Embedded Word Problem Task was: (Place a circle around one number)4

   Much too low 1 2 3 4 5 6 7 8 9 Much too high
   Just
   Right

5. Would you like a copy of the Embedded Word Problems?

   Yes ____ No ____

   What did you base your decision on?

---

4In question 3, the phrase "nor give you any type of reward" was omitted for no-reward control subjects. Question 4 was completely omitted for control subjects.
6. Did you use the scanning procedures to find the embedded words throughout the experiment?

   Yes _____ No _____

   If not, what procedure did you use?
Questionnaire F
Rotter Locus of Control Questionnaire

This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered "a" or "b." Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you are concerned. Be sure to select the one you think you should choose or the one you would like to be true. This is a measure of personal belief; obviously, there are no right or wrong answers.

Please answer these items carefully but do not spend too much time on any one item. Be sure to find an answer for every choice. For each item, place a circle around the letter (a or b) corresponding to the statement you believe to be more true.

In some instances you may discover that you believe both statements or neither one. In such cases, be sure to select the one you most strongly believe to be the case as far as you are concerned. Also, try to respond to each item independently when making your choice; do not be influenced by your previous choices.

1. a. Children get into trouble because their parents punish them too much.
   b. The trouble with most children nowadays is that their parents are too easy with them.

2. a. Many of the unhappy things in people's lives are partly due to bad luck.
   b. People's misfortunes result from the mistakes they make.

3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
   b. There will always be wars, no matter how hard people try to prevent them.

4. a. In the long run people get the respect they deserve in this world.
   b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

5. a. The idea that teachers are unfair to students is nonsense.
   b. Most students do not realize the extent to which their grades are influenced by accidental happenings.
6. a. Without the right breaks one cannot be an effective leader.
b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try, some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.

8. a. Heredity plays the major role in determining one's personality.
b. It is one's experiences in life which determine what they are like.

9. a. I have often found that what is going to happen will happen.
b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. a. In the case of the well-prepared student, there is rarely if ever such a thing as an unfair test.
b. Many times exam questions tend to be so unrelated to the course work that studying is really useless.

11. a. Becoming a success is a matter of hard work; luck has little or nothing to do with it.
b. Getting a good job depends mainly on being in the right place at the right time.

12. a. The average citizen can have an influence in government decisions.
b. This world is run by the few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain that I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.
b. There is some good in everybody.

15. a. In my case, getting what I want has little or nothing to do with luck.
b. Many times we might just as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.
17. a. As far as world affairs are concerned, most of us are the victim of force we can neither understand nor control.  
   b. By taking an active part in political and social affairs, the people can control world events.

18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.  
   b. There really is no such thing as "luck."

19. a. One should always be willing to admit mistakes.  
   b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.  
   b. How many friends you have depends upon how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good ones.  
   b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.  
   b. It is difficult for people to have much control over the things politicians do in office.

23. a. Sometimes I cannot understand how teachers arrive at the grades they give.  
   b. There is a direct connection between how hard I study and the grade I get.

24. a. A good leader expects people to decide for themselves what they should do.  
   b. A good leader must make it clear to everybody what their jobs are.

25. a. Many times I feel that I have little influence over the things that happen to me.  
   b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. a. People are lonely because they don't try to be friendly.  
   b. There's not much use in trying too hard to please people, if they like you, they like you.

27. a. There is too much emphasis on athletics in high school.  
   b. Team sports are an excellent way to build character.
28.  a. What happens to me is my own doing.
    b. Sometimes I feel that I don't have enough control over
       the direction my life is taking.

29.  a. Most of the time I can't understand why politicians behave
       the way they do.
    b. In the long run the people are responsible for bad govern-
       ment on a national as well as on a local level.
APPENDIX B

Pilot Study Results
### Intercorrelations, Means and Standard Deviations for 5 Embedded Word Problems under 6 Minute Time-Limit Condition, Pilot Study (N=9)

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*Decimals omitted*

p ≤ .05 when r ≥ .67

p ≤ .01 when r ≥ .80

### Intercorrelations, Means and Standard Deviations for 5 Embedded Word Problems under 8 Minute Time-Limit Condition, Pilot Study (N=8)

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p ≤ .05 when r ≥ .71

p ≤ .01 when r ≥ .83
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*Decimals omitted

$p < .05$ when $r \geq .67$

$p < .01$ when $r \geq .80$

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*Decimals omitted

$p < .05$ when $r \geq .71$

$p < .01$ when $r \geq .83$
REFERENCES


Kesselman, G. A. Workers' attitudes toward pay under two reward systems and their interrelationship with effort, performance and satisfaction. Unpublished master's thesis. The Ohio State University, Columbus, Ohio, 1972.


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